GENERAL SERVICES ADMINISTRATION

Federal Supply Service
Authorized Federal Supply Schedule Price List

On-line access to contract ordering information, terms and conditions, up-to-date pricing, and the option to create an electronic delivery order is available through GSA Advantage!™, a menu-driven database system. The INTERNET address for GSA Advantage!™ is: GSAAdvantage.gov.

Multiple Award Schedule (MAS)
Federal Supply Group: Professional Services
Contract Number: GS-35F-447DA
For more information on ordering from Federal Supply Schedules go to the GSA Schedules page at GSA.gov.
Effective as of PS-0010 dated 01/09/2019

Contractor: ADVANCED TECHNOLOGY GROUP, INC.
5600 ROSWELL RD NE STE 120 N
ATLANTA, GA 30342-1154

Business Size: Small

Telephone: 404-252-9611
FAX Number: 404-252-8118
Web Site: www.atglearning.com
E-mail: mosy.ford@atglearning.com
Contract Administration: Morteza S Amalfard (Mosi Ford)

CUSTOMER INFORMATION:

1a. Table of Awarded Special Item Number(s) with appropriate cross-reference to item descriptions and awarded price(s):

<table>
<thead>
<tr>
<th>Special Item Number(s)</th>
<th>Description</th>
<th>Awarded Price(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>611420</td>
<td>Information Technology Training</td>
<td></td>
</tr>
<tr>
<td>OLM</td>
<td>Order Level Materials</td>
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</tr>
</tbody>
</table>

1b. Identification of the lowest priced item:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Each Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATB CompTIA A+ CE Token &amp; ATG White Paper Bundle</td>
<td>$ 37.78</td>
</tr>
</tbody>
</table>

1c. See appendix.

2. Maximum Order: 611420 and OLM: $250,000

3. Minimum Order: $100.00

4. Geographic Coverage (delivery Area): 50 United States; District of Columbia; Puerto Rico

5. Point(s) of production (city, county, and state or foreign country): Not Applicable

7. Quantity discounts: None

8. Prompt payment terms: None

9. Foreign items (list items by country of origin): None

10a. Time of Delivery (Contractor insert number of days): Specified on the Task Order

10b. Expedited Delivery. The Contractor will insert the sentence “Items available for expedited delivery are noted in this price list.” under this heading. The Contractor may use a symbol of its choosing to highlight items in its price list that have expedited delivery: Contact Contractor

10c. Overnight and 2-day delivery. The Contractor will indicate whether overnight and 2-day delivery are available. Also, the Contractor will indicate that the schedule customer may contact the Contractor for rates for overnight and 2-day delivery: Contact Contractor

10d. Urgent Requirements. The Contractor will note in its price list the “Urgent Requirements” clause of its contract and advise agencies that they can also contact the Contractor’s representative to effect a faster delivery: Contact Contractor

11. F.O.B Points(s): Destination

12a. Ordering Address(es): Same as Contractor

12b. Ordering procedures: For supplies and services, the ordering procedures, information on Blanket Purchase Agreements (BPA’s) are found in Federal Acquisition Regulation (FAR) 8.405-3.

13. Payment address(es): Same as company address

14. Warranty provision.: Contractor’s standard commercial warranty.

15. Export Packing Charges (if applicable): N/A

16. Terms and conditions of rental, maintenance, and repair (if applicable): N/A

17. Terms and conditions of installation (if applicable): N/A

18a. Terms and conditions of repair parts indicating date of parts price lists and any discounts from list prices (if applicable): N/A

18b. Terms and conditions for any other services (if applicable): N/A

19. List of service and distribution points (if applicable): N/A

20. List of participating dealers (if applicable): N/A

21. Preventive maintenance (if applicable): N/A

22a. Special attributes such as environmental attributes (e.g., recycled content, energy efficiency, and/or reduced pollutants).

22b. If applicable, indicate that Section 508 compliance information is available on Electronic and Information Technology (EIT) supplies and services and show where full details can be found (e.g. contractor’s website or other location.) The EIT standards can be found at: www.Section508.gov; www.atglearning.com

23. Data Universal Numbering System (DUNS) number: 848452090
24. Notification regarding registration in System for Award Management (SAM) database: Registered and current
**Final Pricing:**
The rates shown below include the Industrial Funding Fee (IFF) of 0.75%.

**Courses Test Bundles**

<table>
<thead>
<tr>
<th>ATG MFR PART #</th>
<th>PRODUCT NAME</th>
<th>UOI</th>
<th>GSA OFFER PRICE (inclusive of the .75% IFF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>CompTIA A+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
<td>Each</td>
<td>$ 256.93</td>
</tr>
<tr>
<td>NETB</td>
<td>CompTIA Network+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
<td>Each</td>
<td>$ 325.69</td>
</tr>
<tr>
<td>SECB</td>
<td>CompTIA Security+ Exam Voucher &amp; Kaplan Voucher IT Practice Test Bundle</td>
<td>Each</td>
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<td>CYSAB</td>
<td>CompTIA CySA+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
<td>Each</td>
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<td>CASPB</td>
<td>CompTIA CASP Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
<td>Each</td>
<td>$ 429.22</td>
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<tr>
<td>SERVB</td>
<td>CompTIA Server+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
<td>Each</td>
<td>$ 325.69</td>
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<tr>
<td>LINB</td>
<td>CompTIA Linux+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
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<td>CompTIA Linux+ Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
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</tr>
<tr>
<td>ATB</td>
<td>CompTIA A+ CE Token &amp; ATG White Paper Bundle</td>
<td>Each</td>
<td>$ 37.78</td>
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<tr>
<td>NETTB</td>
<td>CompTIA Network+ CE Token &amp; ATG White Paper Bundle</td>
<td>Each</td>
<td>$ 56.68</td>
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<tr>
<td>SECTB</td>
<td>CompTIA Security+ CE Token &amp; ATG White Paper Bundle</td>
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<td>CASPTB</td>
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<td>CYSATB</td>
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<tr>
<td>CLDTB</td>
<td>CompTIA Cloud+ CE Token &amp; ATG White Paper Bundle</td>
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<tr>
<td>MCPB</td>
<td>Microsoft Certification Professional (MCP) Exam Voucher &amp; Kaplan IT Practice Test Bundle</td>
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<tr>
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<td>Security Fundamentals</td>
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<td>Installing and Configuring Windows Server® 2012</td>
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<td>Administering Windows Server® 2012</td>
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<tr>
<td>Configuring Advanced Windows Server® 2012 Services</td>
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<td>Overview of Active Directory Rights Management Services with Windows Server 2008 R2</td>
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<td>Configuring and Troubleshooting a Windows Server® 2008 Network Infrastructure</td>
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<td>Configuring and Troubleshooting Identity and Access Solutions with Windows Server® 2008 Active Directory®</td>
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<tr>
<td>Planning and Implementing Windows Server® 2008</td>
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<tr>
<td>Designing Windows Server® 2008 Network and Applications Infrastructure</td>
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<td>Configuring and Troubleshooting Windows Server® 2008 Application Infrastructure</td>
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<td>Core Solutions of Microsoft® Exchange Server 2013</td>
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<td>Advanced Solutions of Microsoft Exchange Server 2013</td>
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<td>Configuring, Managing and Troubleshooting Microsoft® Exchange Server 2010</td>
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<td>Updating Your Skills from Microsoft® Exchange Server 2003 or Exchange Server 2007 to Exchange Server 2010</td>
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<td>Designing and Deploying Messaging Solutions with Microsoft® Exchange Server 2010</td>
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<td>Enterprise Voice and Online Services with Microsoft® Lync® Server 2013</td>
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<td>Deploying, Configuring, and Administering Microsoft® Lync™ Server 2010</td>
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<tr>
<td>Planning and Designing a Microsoft® Lync™ Server 2010 Solution</td>
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<td>Core Solutions of Microsoft® SharePoint® Server 2013</td>
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<tr>
<td>Course Title</td>
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<td>Configuring and Administering Microsoft® SharePoint® 2010</td>
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<td>Designing and Developing Microsoft® SharePoint® Server 2010 Applications</td>
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<td>Microsoft® SharePoint® 2010 Search for Application Developers</td>
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<td>Microsoft® FAST Search Server 2010 for SharePoint® for Application Developers</td>
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<tr>
<td>Configuring and Troubleshooting Windows Server® 2008 Active Directory® Domain Services</td>
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<td>Windows Operating System Fundamentals</td>
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<tr>
<td>Querying Microsoft SQL Server®</td>
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<tr>
<td>Administering Microsoft® SQL Server® Databases</td>
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<td>Course Description</td>
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<td>Implementing Data Models and Reports with Microsoft® SQL Server®</td>
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<td>Updating Your SQL Server® 2005 Skills to SQL Server 2008</td>
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MCSE Messaging Boot Camp

About this Course

The Microsoft Certified Solutions Expert (MCSE) Messaging boot camp provides IT professionals hands-on experience to develop their skills in planning, deploying, supporting, maintaining, and optimizing IT infrastructures. The MCSE: Messaging certification validates the knowledge and skills associated with performing as the lead engineer for messaging solutions within an enterprise organization, as well as the ability to design and deploy messaging solutions with Microsoft Exchange Server. Microsoft Exchange powers the new version of Office, making it easy for people to stay connected, access files any time, and maintain messaging security.

MCSE Candidate Profile

The MCSE Messaging validates your ability to move your company to the cloud, increase user productivity and flexibility, reduce data loss, and improve data security for your organization.

Earning an MCSE Messaging certification will qualify you for a position in network and computer systems administration.

Course Outline

Module 1: Preparing for Office 365
This module reviews the features of Office 365 and identifies recent improvements to the service. It then identifies the challenges in deploying Office 365 the benefits of the FastTrack approach compared to the traditional plan/prepare/migrate deployment process. After this, you examine how to plan the pilot, provision tenant accounts and finally, verify that clients can connect to the Office 365 service.

Lessons

• Introduction to Office 365
• Provisioning the Tenant Accounts
• Planning a Pilot
• Enabling Client Connectivity

Module 2: Managing Users, Groups, and Licenses
In this module, students learn about managing users, groups, and licenses by using the Office 365 console and Microsoft PowerShel.

Lessons
• Manage Users and Licenses by Using the Administration Center
• Manage Security and Distribution Groups
• Manage Cloud Identities with Windows PowerShell

Module 3: Administering Office 365
In this module, students learn about more complex administration functions, such as the management of administrators themselves, how to configure and set password policies in Office 365, and how to enable and administer rights management to protect confidential documents.

Lessons

• Manage Administrator Roles in Office 365
• Configure Password Management
• Administer Rights Management

Module 4: Planning and Managing Clients
In this module, students learn how to plan for client deployment and ensure that users get the tools they need to interact with Office 365 effectively. This module covers the planning process, how to make Office 365 ProPlus available to end-users directly, and how to deploy it as a managed package. Finally, this module covers how to set up Office telemetry so that administrators can keep track of how users are interacting with Microsoft Office.

Lessons

• Plan for Office Clients
• Manage User-driven Client Deployments
• Manage IT Deployments of Office 365 ProPlus
• Office Telemetry and Reporting

Module 5: Planning DNS and Exchange Migration
In this module, you learn about the factors that cover DNS domain configuration for Office 365, where you need to add the customer's existing domain or domains to Office 365. This module also covers the individual settings that you need to configure so that each Office 365 service works correctly and fully supports client access. These activities typically happen in the Deploy phase of the FastTrack process.

So far, you have been looking at Office 365 on its own. In this module, you move on to considering what you have to cover when migrating services from your on-premise environment, starting with your email system. This module addresses the key issues of migrating email accounts to Exchange Online and the planning involved in that process. In the lab, you will practice that planning and then carry out a cutover migration from your on-premises environment to Exchange Online.

Lessons

• Add and Configure Custom Domains
• Recommend a Mailbox Migration Strategy

Module 6: Planning Exchange Online and Configuring DNS Records
In this module, you learn about the factors that cover DNS domain configuration for Office 365, where you need to add the customer's existing domain or domains to Office 365. This module also covers the individual settings that you need to configure so that each Office 365 service works correctly and fully supports client
access. These activities typically happen in the Deploy phase of the FastTrack process. This module also addresses the key issues of migrating email accounts to Exchange Online and the planning involved in that process.

Lessons

- Plan for Exchange Online
- Configure DNS Records for Services

Module 7: Administering Exchange Online
In this module, you learn how to configure Exchange Online settings that you planned in the previous module, including archive rules, anti-malware and anti-spam settings, additional email addresses and external contacts and resources. These are actions that you would typically carry out during the Deploy phase of the Office 365 FastTrack deployment or as part of the normal management operations of Exchange Online.

You typically carry out these actions through the Office 365 portal, although you can also use the Windows Azure Active Directory PowerShell console to access additional features.

Lessons

- Configure Personal Archive Policies
- Manage Anti-malware and Anti-spam Policies
- Configure Additional Email Addresses for Users
- Create and Manage External Contacts, Resources, and Groups

Module 8: Configuring SharePoint Online
In this module, students learn how to plan a SharePoint Online implementation that reflects the customer's needs and then create site collections that reflect those requirements. This module then covers the process of external user sharing with SharePoint Online and describes how this arrangement helps organizations share information more effectively.

Lessons

- Manage SharePoint Site Collections
- Configure External User Sharing
- Plan a Collaboration Solution

Module 9: Configuring Lync Online
In this module, students learn how to identify factors in the customer's environment that need to be reflected in the Lync Online deployment plan, then configure Lync Online to reflect the customer's business requirements, both at the end-user level and at the organization level.

Lessons

- Plan for Lync Online
- Configure Lync Online Settings
Module 10: Implementing Directory Synchronization
In this module, students learn how to plan, prepare and implement DirSync as a methodology for user and group management in an Office 365 deployment. The module covers the preparation of an on-premises environment, the installation and configuration of DirSync, and how to manage Active Directory users after DirSync has been enabled.

Lessons

- Prepare On-premises Active Directory for DirSync
- Set up DirSync
- Manage Active Directory Users and Groups with DirSync In Place

Module 11: Implementing Active Directory Federation Services.
In this module, students learn to plan for single sign-on (SSO) by using Active Directory Federation Services (AD FS) and then cover the process for setting up an AD FS server farm and an AD FS proxy. This module also cover the management process for certificates and the AD FS servers.

Lessons

- Planning for AD FS
- Install and Manage AD FS Servers
- Install and Manage AD FS Proxy Servers

Module 12: Monitoring Office 365.
In this module, students learn about monitoring user connections to Office 365 and how to cope with service outages. They look at a range of tools that diagnose service health and review the reports that Office 365 provides.

Lessons

- Isolate Service Interruption
- Monitor Service Health
- Analyze Reports

Module 13: Deploying and Managing Microsoft Exchange Server 2013
This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.

Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Module 13: Planning and Configuring Mailbox Servers.
This module describes how to plan and configure the Mailbox server role.

Lessons
• Overview of the Mailbox Server Role
• Planning the Mailbox Server Deployment
• Configuring the Mailbox Servers

Module 14: Managing Recipient Objects,
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

• Managing Exchange Server 2013 Mailboxes
• Managing Other Exchange Recipients
• Planning and Implementing Public Folder Mailboxes
• Managing Address Lists and Policies

Module 15: Planning and Deploying Client Access Servers.
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

• Planning Client Access Server Deployment
• Configuring the Client Access Server Role
• Managing Client Access Services

Module 16: Planning and Configuring Messaging Client Connectivity.
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

• Client Connectivity to the Client Access Server
• Configuring Outlook Web App
• Planning and Configuring Mobile Messaging
• Configuring Secure Internet Access for Client Access Server

Module 17: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

• High Availability on Exchange Server 2013
• Configuring Highly Available Mailbox Databases
• Configuring Highly Available Client Access Servers
Module 18: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 19: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 20: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 21: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
- Configuring Audit Logging

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
Module 23: Designing and Implementing Site Resilience.
This module explains how to design and implement site resilience for Exchange Server 2013.

Lessons

- Site Resilience and High Availability in Exchange Server 2013
- Planning a Site Resilient Implementation
- Implementing Site Resilience

This module explains how to plan a virtualization strategy for Exchange Server 2013 roles.

Lessons

- Planning a Hyper-V Deployment to Exchange Server 2013
- Virtualizing Exchange Server 2013 Server Roles

This module explains the basic concept of Unified Messaging in Exchange Server 2013.

Lessons

- Overview of Telephony Technologies
- Unified Messaging in Exchange Server 2013
- Unified Messaging Components

This module explains how to design and implement Exchange Server 2013 Unified Messaging.

Lessons

- Designing a Unified Messaging Deployment
- Deploying and Configuring Unified Messaging Components
- Designing and Implementing Exchange Server 2013 UM Integration with Lync Server 2013

This module explains how to design and implement message transport security.

Lessons

- Overview of Messaging Policy and Compliance Requirements
- Designing and Implementing Transport Compliance
- Designing and Implementing Active Directory Rights Management Services (AD RMS) Integration with Exchange Server 2013
Module 28: Designing and Implementing Message Retention.
This module explains how to design and implement message retention in Exchange Server 2013.

Lessons

- Overview of Messaging Records Management and Archiving
- Designing In-Place Archiving
- Designing and Implementing Message Retention

Module 29: Designing and Implementing Messaging Compliance.
This module explains how to design and implement messaging compliance.

Lessons

- Designing and Implementing Data Loss Prevention
- Designing and Implementing In-Place Hold
- Designing and Implementing In-Place eDiscovery

Module 30: Designing and Implementing Administrative Security and Auditing.
This module explains how to design and implement administrative security in an Exchange Server 2013 environment.

Lessons

- Designing and Implementing Role-Based Access Control (RBAC)
- Designing and Implementing Split Permissions
- Planning and Implementing Audit Logging

This module explains how to use Windows PowerShell 3.0 to manage Exchange Server 2013.

Lessons

- Overview of Windows PowerShell 3.0
- Managing Exchange Server Recipients by Using the Exchange Management Shell
- Using Windows PowerShell to Manage Exchange Server

Module 32: Designing and Implementing Integration with Microsoft Exchange Online.
This module explains how to design and implement integration with Exchange Online.

Lessons

- Planning for Exchange Online
- Planning and Implementing the Migration to Exchange Online
- Planning to Coexist with Exchange Online
Module 33: Designing and Implementing Messaging Coexistence.
This module explains how to design and implement messaging coexistence.

Lessons

- Designing and Implementing Federation
- Designing Coexistence Between Exchange Server Organizations
- Designing and Implementing Cross-Forest Mailbox Moves

Module 34: Designing and Implementing Exchange Server Upgrades.
This module explains how to design and implement upgrades from previous Exchange Server versions.

Lessons

- Planning the Upgrade from Previous Exchange Server Versions
- Implementing the Upgrade from Previous Exchange Versions
Programming with the Microsoft .NET Framework (Microsoft Visual C# .NET)
Course#: MS2349

| Length: | 5 Days |
| Audience: | IT Professionals |
| Technology: | C# with Microsoft .NET |
| Type: | Hands-On course |
| Delivery Method: | Instructor-led Classroom |

### About this Course

The goal of this course is to help application developers understand the Microsoft .NET Framework. In addition to offering an overview of the .NET Framework and an introduction to key concepts and terminology, the course provides a series of labs, which introduce and explain .NET Framework features that are used to code, debug, tune, and deploy applications.

### Audience Profile

This course is intended for experienced, professional software developers including those employed by independent software vendors or those who work on corporate enterprise development teams. Most students will be Microsoft Visual C++ (or C++) and Java developers.

### At Course Completion

At the end of the course, students will be able to:

- List the major elements of the .NET Framework and explain how they fit into the .NET platform.
- Explain the main concepts behind the common language runtime and use the features of the .NET Framework to create a simple application.
- Create and use components in Windows Forms-based and ASP.NET-based applications.
- Use the deployment and versioning features of the .NET runtime to deploy multiple versions of a component.
- Create, use, and extend types by understanding the Common Type System architecture.
- Create classes and interfaces that are functionally efficient and appropriate for given programming scenarios.
- Use the .NET Framework class library to efficiently create and manage strings, arrays, collections, and enumerators.
- Use delegates and events to make an event-sender object signal the occurrence of an action to an event-receiver object.
- Describe and control how memory and other resources are managed in the .NET Framework.
- Read from and write to data streams and files.
- Use the basic request/response model to send and receive data over the Internet.
- Serialize and deserialize an object graph.
- Create distributed applications by means of XML Web services and Object Remoting.

### Prerequisites

Before attending this course, students should be experienced professional software developers and have a basic understanding of the C# language.
Module 1: Overview of the Microsoft .NET Framework

The following topics are covered in this module:
Lessons

- Overview of the Microsoft .NET Framework
- Overview of Namespaces

After completing this module, students will be able to:

- Describing the .NET Framework and its components.
- Explaining the relationship between the .NET Framework class library and namespaces.

Module 2: Introduction to a Managed Execution Environment

- Writing a .NET Application
- Compiling and Running a .NET Application

After completing this module, you will be able to explain the main concepts behind the common language runtime and use the features of the common language runtime to create a simple application.

This includes:

- Creating simple console applications in C#.
- Explaining how code is compiled and executed in a managed execution environment.
- Explaining the concept of garbage collection.

Module 3: Working with Components

The following topics are covered in this module:
Lessons

- An Introduction to Key .NET Framework Development Technologies
- Creating a Simple .NET Framework Component

Module 4: Deployment and Versioning

The following topics are covered in this module:
Lessons

- Introduction to Application Deployment
- Application Deployment Scenarios
- Related Topics and Tools

After completing this module, you will be able to use the deployment and versioning features of the .NET common language runtime to deploy multiple versions of a component. This includes:

- Packaging and deploying simple and componentized applications.
- Creating strong-named assemblies.
- Installing and removing assemblies from the global assembly cache.
- Configuring applications to control binding based on assembly location and version data.

Module 5: Common Type System

The following topics are covered in this module:
Lessons

- An Introduction to the Common Type System
- Elements of the Common Type System
• Object-Oriented Characteristics

After completing this module, you will be able to create, use, and extend types. This includes:

• Describing the difference between value types and reference types.
• Explaining the purpose of each element in the type system, including values, objects, and interfaces.
• Explaining how object-oriented programming concepts, such as abstraction, encapsulation, inheritance, and polymorphism, are implemented in the Common Type System.

Module 6: Working with Types

The following topics are covered in this module:

Lessons

• System.Object Class Functionality
• Specialized Constructors
• Type Operations
• Interfaces
• Managing External Types

After completing this module, you will be able to create classes and interfaces that are functionally efficient and appropriate for given programming scenarios. This includes:

• Applying attributes to control visibility and inheritance in classes and interfaces.
• Creating and using interfaces that define methods and properties.
• Explaining how boxing and unboxing work and when boxing and unboxing occur.
• Using operators to determine types at run time and to cast values to different types.
• Explaining what features are available to work with unmanaged types, such as COM types.

Module 7: Strings, Arrays, and Collections

The following topics are covered in this module:

Lessons

• Strings

Module 8: Delegates and Events

The following topics are covered in this module:

Lessons

• Delegates
• Multicast Delegates
• Events
• When to Use Delegates, Events, and Interfaces

After completing this module, you will be able to use delegates and events to have an event sender object signal the occurrence of an action to an event receiver object. This includes:

• Using the delegate class to create type-safe callback functions and event-handling methods.
• Using the event keyword to simplify and improve the implementation of a class that raises events.
• Implementing events that conform to the .NET Framework guidelines.

Module 9: Memory and resource Management

The following topics are covered in this module:

Lessons

• Memory Management Basics
• Non-Memory Resource Management
• Implicit Resource Management
• Explicit Resource Management
• Optimizing Garbage Collection

After completing this module, you will be able to describe and control how memory and other resources are managed in the .NET Framework. This includes:

• Describing how garbage collection manages object memory.
• Implicitly managing non-memory resources by using a destructor's finalize code.
• Explicitly managing non-memory resources by using client-controlled deterministic release of resources.
• Writing code by using the temporary resource usage design pattern.
• Programatically controlling the behavior of the garbage collection.
• Describing advanced garbage collection features.

Module 10: Data Streams and Files
The following topics are covered in this module:
Lessons

• Streams
• Readers and Writers
• Basic File I/O

After completing this module, you will be able to read from and write to data streams, files, and the Internet. This includes:

• Using Stream objects to read and write bytes to backing stores, such as strings and files.
• Using BinaryReader and BinaryWriter objects to read and write primitive types as binary values.
• Using StreamReader and StreamWriter objects to read and write characters to a stream.
• Using StringReader and StringWriter objects to read and write characters to strings.
• Using Directory and DirectoryInfo objects to create, move, and enumerate through directories and subdirectories.

Module 11: Internet Access
The following topics are covered in this module:
Lessons

• Internet Application Scenarios
• The WebRequest and WebResponse Model
• Application Protocols
• Handling Errors
• Security
• Best Practices

After completing this module, you will be able to use the .NET Framework classes to work with data over the Internet. This includes:

• Using the basic request/response model to send and receive data over the Internet.
• Using the System.Net classes to communicate with other applications by using the Hypertext Transfer Protocol (HTTP), Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Socket Internet protocols.

Module 12: Serialization
The following topics are covered in this module:
Lessons

• Serialization Scenarios
• Serialization Attributes
• Object Graph
• Serialization Process
• Serialization Example
• Deserialization Example
• Custom Serialization
• Custom Serialization Example
• Security Issues

After completing this module, you will be able to serialize and deserialize an object graph. This includes:
• Writing an application that serializes and deserializes an object graph by using either a binary or Simple Object Access Protocol (SOAP) XML format.

Module 13: Remoting and XML Web Services
The following topics are covered in this module:

Lessons

• Remoting
• Remoting Configuration Files
• XML Web Services

After completing this module, you will be able to create distributed applications by means of XML Web services and Object Remoting. This includes:

• Writing and configuring distributed applications that use .NET Remoting.
• Creating an XML Web service by using Visual Studio .NET and ASP.NET.
• Consuming an XML Web service by using the Web Services Description Language tool (Wsdl.exe).
About this Course

This five-day, instructor-led course provides students with the skills required to build Microsoft Windows Forms applications by using the Microsoft .NET Framework. This course is a part of the Microsoft Visual C# .NET curriculum and is intended to provide C# programmers with the skills required to create Windows Forms applications by using the .NET Framework. The course will cover the major topics for Windows client application programming on the .NET Framework. These topics include: Windows Forms, GDI+, simple data access, interoperating with unmanaged code, threading and asynchronous programming issues, simple remoting, Web access, Web Services consumption, debugging, security, and deployment issues for desktop applications.

Audience Profile

This course is intended for the intermediate programmer who is responsible for designing and building Windows-based applications with the .NET Framework. It is designed for developers who have C# development skills. Students are required to have the following skills:

- Experience with a .NET language such as Visual C# .NET or Microsoft Visual C++ .NET
- Experience developing basic applications with MFC and/or Microsoft Visual Basic 6.0

Typically, these individuals perform the following key activities:

- Help create functional specifications.
- Design and develop user interfaces.
- Create and test prototypes.
- Write Windows Forms applications.

At Course Completion

After completing this course, students will be able to:

- Create and populate Windows Forms.
- Organize controls on Windows Forms.
- Create menus in a Windows Forms application.
- Add code to form and control event procedures in a Windows Forms application.
- Create Multiple Document Interface (MDI) applications.
- Use dialog boxes in Windows Forms applications.
- Validate user input in a Windows Forms application.
- Create and use user controls in a Windows Forms application.
- Create licenses for controls.
- Bind Windows Forms applications to various data sources by using Microsoft ADO.NET.
- Consume XML Web services from Windows Forms applications.
Use .NET and COM components in a Windows Forms application.
Call Microsoft Win32 APIs from a Windows Forms application.
Print documents in a Windows Forms application.
Make asynchronous calls to methods from a Windows Forms application.
Debug a Windows Forms application.
Incorporate accessibility features in a Windows Forms application.
Incorporate accessibility features in a Windows Forms application.
Localize a Windows Forms application.
Add support for Help to localize a Windows Forms application.
Create Help files in a Windows Forms application.
Deploy a Windows Forms application.
Implement code access and role-based security in a Windows Forms application.
Add deployment flexibility to applications by using shared assemblies.

The course assumes that students have the following skills:

- Understanding of C# programming
- Experience building applications

Module 1: Introducing Windows Forms
Lessons
- Creating a Form
- Adding Controls to a Form
- Creating an Inherited Form
- Organizing Controls on a Form
- Creating MDI Applications

Lab: Creating Windows Forms
- Creating a New Windows Form
- Inheriting a New Form from an Existing Windows Form

After completing this module, students will be able to:
- Create a form and add controls to it.
- Create an inherited form by using Visual Inheritance.
- Organize controls on a form.
- Create Multiple Document Interface (MDI) applications.

Module 2: Working with Controls
This module explains how to create event procedures (handlers) in your application that will run in response to user actions. Students will learn how to add programming logic to the event procedures of a control, how to use the Windows Forms intrinsic controls, dialog boxes, and menus, and how to validate the data entered by users of your application.

Lessons
- Creating an Event Handler for a Control
- Using Windows Forms Controls
- Using Dialog Boxes in a Windows Forms Application
- Adding Controls at Run Time
- Creating Menus
- Validating User Input

Lab: Working with Controls
- Creating and Using Controls

After completing this module, students will be able to:
• Create an event handler for a control.
• Select and use the appropriate controls in a Windows Forms application.
• Use dialog boxes in a Windows Forms application.
• Add controls to a form at run time.
• Create and use menus in a Windows Forms application.
• Validate user input in a Windows Forms application.

Module 3: Building Controls
This module explains how to extend the functionality of an existing Windows control, combine multiple existing controls into a composite control, and build a new custom control. Students will also learn how to add design-time licensing support to a control.

Lessons
• Extending and Creating Controls
• Adding Design-Time Support for Controls
• Licensing a Control

Lab: Building Controls
• Declare an Event and Raising It from an Extended Control
• Creating a Composite Control
• Adding Design-Time Support

After completing this module, students will be able to:
• Extend an existing control.
• Create a composite control by combining functionality of several existing Windows Forms controls.
• Describe the design-time support options for components provided by Visual Studio .NET.
• Add attributes that provide information to the Visual Designer.
• Create and validate licenses for controls.

Module 4: Using Data in Windows Forms Applications
This module explains how to bind Windows forms to various data sources by using ADO .NET. Students will learn about binding Windows forms to data from sources such as databases and XML files. Students will get an overview of the XML Web services programming model and learn how to create applications that use XML Web services. The module also provides an overview of how to persist data to and read data from files and isolated storage.

Lessons
• Adding ADO.NET Objects to and Configuring ADO.NET Objects in a Windows Forms Application
• Accessing and Modifying Data by Using DataSets
• Binding Data to Controls
• Overview of XML Web Services
• Creating a Simple XML Web Services Client
• Persisting Data

Lab: Accessing Data with ADO.NET
• Generating and Populating DataSets
• Modifying a DataSet
• Updating a DataSet to a DataSource
• Binding and Formatting Data in Controls

Lab: Calling an XML Web Service
• Calling an XML Web Service

After completing this module, students will be able to:
• Describe the objects in the ADO.NET object model.
• Add and configure ADO.NET objects in a Windows Forms application.
• Access and modify data from a database by using DataSets.
• Bind data to controls.
• Describe the XML Web services model and the roles of HTML, SOAP, and XML in the XML Web services model.
• Create and test a simple XML Web service client application.
• Persist data to files, serialize objects, use isolated storage, and persist application settings.

Module 5: Interoperating with Managed Objects
This module explains how to use .NET and COM components in a Windows Forms application. Students will also learn how to call Win32 APIs in their Windows Forms application.

Lessons

• Using .NET and COM Components in a Windows Forms Application
• Calling Win32 APIs from Windows Forms Applications

Lab: Interoperating with COM and Calling Win32 APIs

• Using a COM Component in a .NET-Based Application
• Calling Win32 APIs from a .NET-Based Application

After completing this module, students will be able to:

• Use .NET and COM components in a Microsoft .NET Framework Windows Forms application.
• Call Win32 APIs from a Windows Forms application.

Module 6: Printing and Reporting in Windows Forms Applications

Lessons

• Printing From a Windows Forms Application
• Using the Print Preview, Page Setup, and Print Dialogs
• Constructing Print Document Content by Using GDI+
• Creating Reports by Using Crystal Reports

Lab: Printing Formatted Documents

• Adding Print Support to an Application
• Creating Printed Output by Using GDI+

After completing this module, students will be able to:

• Print documents in a Windows Forms application.
• Use the Visual Studio .NET printing dialog boxes in a Windows Forms application.
• Use GDI+ to construct print document content.
• Create and format reports by using Crystal Reports.

Module 7: Asynchronous Programming

This module explains how to use the techniques of asynchronous programming and multithreading to avoid blocking the user interface of an application.

Lessons

• The .NET Asynchronous Programming Model
• The Asynchronous Programming Model Design Pattern
• How to Make Asynchronous Calls to Any Method
• Helping Protect State and Data in a Multithreaded Environment

Lab: Making Asynchronous Calls to an XML Web Service

• Converting Synchronous Calls to Asynchronous Calls

After completing this module, students will be able to:

• Describe the .NET Framework asynchronous programming model.
• Modify a client application to use built-in .NET Framework support for asynchronous calls to methods.
• Describe how to add explicit support for asynchronous calls to any method.

Module 8: Enhancing the Usability of Applications
This module covers how to use the accessibility, Help, and localization features available in the .NET Framework.

Lessons

- Adding Accessibility Features
- Adding Help to an Application
- Localizing an Application

Lab: Enhancing the Usability of an Application

- Adding Support for Accessibility
- Adding Help to an Application
- Adding ToolTips to an Application
- Localizing the User Interface of an Application
- Localizing Resources in an Application

After completing this module, students will be able to:

- Use .NET Framework features to add and enable accessibility features in an application.
- Add support for context-sensitive Help, Help menus, and ToolTips to an application.
- Use localization properties and resource files to create a localized version of a .NET Framework Windows Forms application.

Module 9: Deploying Windows Forms Applications

This module explains assemblies and how to use strong-named assemblies and the Global Assembly Cache (GAC) in the .NET Framework. Students will also learn how to configure and deploy .NET-based applications.

Lessons

- .NET Assemblies
- Deploying Windows Forms Applications

Lab: Deploying an Application

- Building and Referencing a Strong-Named Assembly
- Installing a Strong-Named Assembly into the Global Assembly Cache

- Deploying a .NET Application
- Using an Application Configuration File

After completing this module, students will be able to:

- Use strong-named assemblies in .NET applications.
- Use application configuration files to configure and use Microsoft Windows Installer 2.0 to package and deploy .NET applications.

Module 10: Securing Windows Forms Applications

This module explains the .NET Framework security model. Students will learn how to use .NET Framework security features in Windows Forms applications.

Lessons

- Security in the .NET Framework
- Using Code Access Security
- Using Role-Based Security

Lab: Adding and Testing Permission Requests

- Adding and Testing Permission Requests

After completing this module, students will be able to:

- Describe the .NET Framework security model.
- Use code access security to help protect an application.
- Use role-based security to help control access to an application.
Introduction to C# Programming with Microsoft .NET

Course#: MS2609

Length: 5 Days
Audience: IT Professionals
Technology: C# with Microsoft .NET
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course

In this five-day instructor-led course, developers learn the fundamental skills that are required to design and develop object-oriented applications for the Web and Microsoft Windows by using Microsoft Visual C# .NET and the Microsoft Visual Studio .NET development environment. This course provides an alternative entry point for less experienced programmers who are not familiar with object-oriented design and programming with Windows or the Web.

Audience Profile

This course is intended for:

- Developers who are not familiar with object-oriented programming.
- Developers who understand computer programming, but may have learned programming by using a non-graphical language in a university.

These developers want to build highly functional Web and Windows solutions and Web Services by using Microsoft Visual C# .NET and the Microsoft .NET Framework.

At Course Completion

After completing this course, students will be able to:

- Explain the .NET platform.
- Configure and use Visual Studio .NET.
- Program with C#.
- Implement methods.
- Implement encapsulation, inheritance, and polymorphism in C#.
- Use C# within the .NET Framework.
- Use Microsoft ADO.NET to access and manipulate data in a database.
- Create feature-rich Windows-based applications.
- Create a Web application by using Web Forms.
- Use XML Web services in a C# application.
- Experiment with more advanced features of C#.

Prerequisites

Experience with object-oriented programming and concept is not required for this course. Before attending this course, students must have competency in the following areas:

- Familiarity and comfort with basic operating system functions such as file manipulation.
Course Outline

Module 1: Getting Started
This module presents the concepts that are central to the Microsoft .NET Framework and platform, and the Microsoft Visual Studio .NET integrated development environment (IDE); describes how to work in the development environment; and explains how to use Visual Studio .NET to create and build applications based on Microsoft .NET.

Lessons
- Introduction to .NET and the .NET Framework
- Exploring Visual Studio .NET
- Creating a Windows Application Project

After completing this module, students will be able to:
- Identify components of the .NET platform and the .NET Framework by their function.
- Explore the Visual Studio development environment.
- Create a basic application based on Microsoft Windows.

Module 2: Understanding C# Language Fundamentals
This module explains the syntax and structure of the C# programming language. These topics are essential for students to understand in order to be successful in the remainder of the course; however, it is likely that most students will come into the class with some experience applying these concepts in other languages.

Lessons
- Understanding the Fundamentals of a C# Program
- Using C# Predefined Types
- Writing Expressions
- Creating Conditional Statements
- Creating Iteration Statements

Lab: Writing a Savings Account Calculator
- Write a Savings Calculator
- Extending the Savings Calculator

After completing this module, students will be able to:
- Understand the fundamentals of a C# program.
- Use C# predefined types.
- Write expressions.
- Create conditional statements.
- Create iteration statements.

Module 3: Creating Objects in C#
This module introduces the fundamentals of object-oriented programming, including the concepts of objects, classes, and methods.

Lessons
- Defining a Class
- Declaring Methods
- Using Constructors
- Using Static Class Members

Lab: Creating Classes in C#
- Creating the Bank Account Objects

After completing this module, students will be able to:
- Define a class.
- Declare methods.
- Use constructors.
- Use static class members.
Module 4: Implementing Object-Oriented Programming Techniques in C#
This module introduces the fundamentals of object-oriented programming, including the concepts of objects, classes, and methods.

Lessons
- Designing Objects
- Using Inheritance
- Using Polymorphism

Lab: Creating Classes in C#
- Creating the Bank Account Objects

After completing this module, students will be able to:
- Encapsulate information in an object.
- Create an object that inherits functionality from another object.
- Implement polymorphism to use abstract classes.

Module 5: Programming with C#
This module introduces various data structures, including arrays (the System, Array class) and collections (classes in the System.Collections namespace), and explains when to use each of these data structures in an application. The module also introduces interfaces, describes the concepts and syntax of exception handling, and explains delegates and their use in event handling.

Lessons
- Using Arrays
- Using Collections
- Using Interfaces
- Using Exception Handling
- Using Delegates and Events

Lab: Using Arrays
- Sorting Numbers in an Array

Lab: Using Indexers and Interfaces
- Writing the Check Pick-up Application
- Using Interfaces

Lab: Using Delegates and Events
- Working with Events and Delegates

After completing this module, students will be able to:
- Create and use arrays.
- Use classes in the System.Collections namespace.
- Use the ArrayList class.
- Use interfaces.
- Handle exceptions.
- Create and call a delegate.
- Use delegates to handle events.

Module 6: Building .NET-based Applications with C#
This module presents the Microsoft .NET Framework class library, the Object Browser, and methods that are inherited from the System.Object class. This module also explains how to format strings and numbers and how to use streams and files.

Lessons
- Examining the .NET Framework Class Library
- Overriding Methods from System.Object
- Formatting Strings and Numbers
- Using Streams and Files

Lab: Using Streams
- Converting a Binary File to a Text File

After completing this module, students will be able to:
- Identify a namespace in the .NET Framework class library by its function.
- Override and implement the ToString method.
- Format strings, currency, and date values.
- Read and write both binary and text files.
Module 7: Using ADO.NET to Access Data
This module explains how to use Microsoft ADO.NET and the objects in the System.Data namespace to access data in a database. It describes how to create an application based on Microsoft Windows that uses ADO.NET. This module also describes how to use that application to connect to a database, create a query, and use a DataSet object to manage the data, bind data to controls, and insert, update, and delete records in a database.

Lessons
- ADO.NET Architecture
- Creating an Application That Uses ADO.NET to Access Data
- Changing Database Records

Lab : Creating a Data Access Application with ADO.NET
- Creating a Simple Database Table Viewer
- Writing a Simple Database Table Viewer
- (If time permits): Creating a Simple Database Table Viewer

Lab : Creating a Windows Application That Uses ADO.NET
- Creating a Windows Application That Uses ADO.NET
- (If time permits): Writing an ADO.NET Application with Windows Forms

After completing this module, students will be able to:
- Describe ADO.NET.
- Create a Windows-based application that uses ADO.NET.
- Connect to a database.
- Create a query.
- Use a DataSet object to manage data.
- Bind a DataGrid object to a data source.
- Insert, update, and delete a database record.

Module 8: Creating Windows-based Applications
This module describes how to create menus, common and custom dialog boxes, status bars, and toolbars to enhance the usability of an application based on Microsoft Windows. The purpose of this module is to allow the students to apply their newly acquired C# language skills and develop useful Windows-based applications.

Lessons
- Creating the Main Menu
- Creating and Using Common Dialog Boxes
- Creating and Using Custom Dialog Boxes
- Creating and Using Toolbars
- Creating the Status Bar
- Creating and Using ComboBox Boxes

Lab : Building Windows Applications
- Adding Common Dialog Boxes to an Application
- Creating and Using Custom Dialog Boxes
- Creating a Status Bar
- (If Time Permits): Using ComboBox Controls

After completing this module, students will be able to:
- Create the main menu.
- Create and use common dialog boxes.
- Create and use custom dialog boxes.
- Create and use toolbars.
- Create the status bar.
- Create and use combo boxes.

Module 9: Using XML Web Services in a C# Program
The module introduces the System.Web.Services namespace and the process of building and consuming XML Web services in a C# application.

Lessons
- Consuming an XML Web Service
- Building an XML Web Service

Lab : Using XML Web Services
• Writing the Office Building Estimation Application

After completing this module, students will be able to:

• Request data from an XML Web service from within a C# application.
• Build an XML Web service.

Module 10: Creating a Web Application with Web Forms
In this module, students learn that in Microsoft Visual Studio .NET, you can use Web Forms to create programmable Web pages. This module introduces the System.Web.UI namespace and describes how to create a Web application with a Web Form. Students learn how to add controls to a Web Form and then use the Web Form to submit data and respond to events. The module also covers Microsoft ASP.NET state management, security, and configuration settings.

Lessons

• Creating a Web Forms Application
• Accessing Data by Using a Web Forms Application
• Configuring ASP.NET Application Settings

Lab: Developing an ASP.NET Web Application

• Completing the User Authentication Validation Code
• Completing the Code for the Master.aspx Form
• Testing the Application

After completing this module, students will be able to:

• Create a Web Forms application.
• Handle events on a Web Forms application.
• Access data from a Web Forms application.
• Configure ASP.NET application settings.

Module 11: Application Settings and Deployment
This module introduces the procedures that are involved in deploying a C# application by using Microsoft Visual Studio .NET. It explains how to deploy both Web-based applications and applications that are based on Microsoft Windows. It also describes how to store user preferences and configure application settings.

Lessons

• Working with Application Settings
• Deploying Applications

Lab: Deploying an Application

• Adding a Setup Project to an Existing Application
• Installing and Testing the Setup Application

Lab: Working with Application Settings

• Adding the UserPreferences Class
• Adding User Preferences to the Form Load Event
• Adding User Preferences to the loadItem_Click Event
• Declaring an Instance of the UserPreferences Class in the Options Form
• Setting the Checkbox Controls to the Values Contained in the Registry
• Save the Checkbox Controls Values to the Registry
• Testing the Zoo Information Application

After completing this module, students will be able to:

• Work with application settings.
• Deploy an application.

Module 12: Exploring Future Learning
This module provides an opportunity for students to explore some of the more advanced capabilities of C#, to practice the knowledge and skills that they acquired during the course, and discuss their questions as a group.

Lessons

• Exploring Additional Features of C#
After completing this module, students will be able to:

- Locate resources for additional C# features.
- Use those resources to further develop any of the projects that they started earlier in this course.
Updating Your SQL Server 2005 Skills to SQL Server 2008

Course 6158

Length: 3 Days
Audience: IT Professionals
Technology: Microsoft SQL Server 2008
Type: Course
Delivery Method: Instructor-led Classroom

About this Course

This three-day instructor-led course provides students with the knowledge and skills to upgrade their SQL Server 2005 skills to SQL Server 2008.

Audience Profile

- This course is intended for experienced SQL Server 2005 developers and database administrators who want to upgrade their skills to SQL Server 2008.

At Course Completion

- After completing this course, students will be able to:
  - Describe the new features of SQL Server 2008.
  - Manage SQL Server 2008.
  - Secure a SQL Server 2008 Database.
  - Develop databases with SQL Server 2008.
  - Create and maintain highly available SQL Server 2008 databases.
  - Create and use a SQL Server 2008 data warehouse.
  - Use SQL Server 2008 Reporting Services.
  - Use SQL Server 2008 Analysis Services.

Prerequisites

Before attending this course, students must have experience developing or administering SQL Server 2005 databases.

Course Outline

Module 1: Introduction to SQL Server 2008

Lessons

- The Evolution of SQL Server
- Preparing for SQL Server 2008

Lab: Exploring SQL Server Books Online

- Reviewing the SQL Server Books Online Tutorials
- Reviewing SQL Server Books Online

After completing this module, students will be able to:

- Describe the evolution of SQL Server.
- Prepare for SQL Server 2008.
Module 2: SQL Server 2008 Manageability Enhancements

Lessons
- Configuration Servers
- Policy-Based Management

Lab: Managing SQL Server 2008
- Creating a Configuration Server
- Creating and Applying a Policy

After completing this module, students will be able to:
- Create and use a configuration server.
- Create and use policies.

Module 3: SQL Server 2008 Performance Enhancements

Lessons
- Managing Workloads with Resource Governor
- Monitoring Performance with the Data Collector
- Managing Performance with Plan Freezing

Lab: Optimizing SQL Server 2008
- Using Resource Governor
- Using the Data Collector

After completing this module, students will be able to:
- Manage workloads with Resource Governor.
- Monitor performance with the Data Collector.
- Manage performance with Plan Freezing.

Module 4: SQL Server 2008 Security Enhancements

Lessons
- Encrypting Databases
- Auditing All Actions

Lab: Securing a SQL Server 2008 Database
- Using Transparent Data Encryption

After completing this module, students will be able to:
- Encrypt databases.
- Audit all actions.

Module 5: SQL Server 2008 Database Development Enhancements

Lessons
- Developer Tool Enhancements
- Data Type Enhancements
- Working with Spatial Data

Lab: Developing Databases with SQL Server 2008
- Using Date and Time Data Types
- Using Spatial Data

After completing this module, students will be able to:
- Describe the developer tool enhancements in SQL Server 2008.
- Use the data type enhancements in SQL Server 2008.
- Work with spatial data.

Module 6: SQL Server 2008 Availability Enhancements

Lessons
- Always On Technologies
- Transactional Peer-to-Peer Replication
Lab: Maintaining High Availability

- Configuring Peer-to-Peer Replication
- Adding a Replication Node

After completing this module, students will be able to:

- Describe the SQL Server 2008 always on technologies.
- Implement transactional peer-to-peer replication.

Module 7: SQL Server 2008 Data Warehousing Enhancements

Lessons

- ETL Enhancements
- Using Partitioned Tables
- Optimizing Data Storage

Lab: Data Warehousing with SQL Server 2008

- Using Change Data Capture
- Using the MERGE Statement
- Working with Partitioned Data

After completing this module, students will be able to:

- Describe the ETL enhancements in SQL Server 2008.
- Use partitioned tables.
- Optimize data storage.

Module 8: SQL Server 2008 Reporting Services Enhancements

Lessons

- Reporting Services Architecture and Management
- Authoring Reports
- Report Processing and Rendering

Lab: Using SQL Server 2008 Reporting Services

- Creating a Report with Report Designer
- Managing Reporting Services

After completing this module, students will be able to:

- Describe the Reporting Services architecture and management.
- Author reports.
- Understand report processing and rendering.

Module 9: SQL Server 2008 Analysis Services Enhancements

Lessons

- Multidimensional Analysis with SQL Server Analysis Services
- Data Mining with SQL Server Analysis Services

Lab: Using SQL Server 2008 Analysis Services

- Implementing Multidimensional Analysis
- Implementing Data Mining

After completing this module, students will be able to:

- Implement multidimensional analysis.
- Implement data mining.
About this Course

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2008 R2 database. The course focuses on teaching individuals how to use SQL Server 2008 R2 product features and tools related to maintaining a database.

Audience Profile

- The primary audience for this course is individuals who administer and maintain SQL Server databases. This course can also be helpful for individuals who develop applications that deliver content from SQL Server databases.

At Course Completion

- After completing this course, students will be able to:
- Explain SQL Server 2008 R2 architecture, resources requirements and perform pre-checks of I/O subsystems
- Plan, install and configure SQL Server 2008 R2
- Backup and restore databases
- Import and export wizards and explain how they relate to SSIS
- Use BCP and BULK INSERT to import data
- Manage security
- Assign, configure fixed database roles and create and assign user defined database roles
- Configure and assign permissions
- Implement SQL Server 2008 R2 Audits
- Manage SQL Server 2008 R2 Agent and Jobs
- Configure database mails, alerts and notifications
- Maintain databases
- Configure SQL Profiler Traces and Use the Database Tuning Advisor
- Monitor data by using Dynamic Management Views
- Execute multi-server queries and configure a central management server
- Deploy a data-tier-application
- Troubleshoot common issues
Prerequisites

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.
- Completed Course 2778: Writing Queries Using Microsoft SQL Server 2008 Transact-SQL

Course Outline

Module 1: Introduction to SQL Server 2008 R2 and its Toolset

This module introduces you to the entire SQL Server platform and its major tools. This module also covers editions, versions, basics of network listeners, and concepts of services and service accounts.

Lessons

- Introduction to SQL Server Platform
- Working with SQL Server Tools
- Configuring SQL Server Services

Lab: Introduction to SQL Server 2008 R2 and its Toolset

- Verify SQL Server Component Installation
- Alter Service Accounts for New Instance
- Enable Named Pipes Protocol for Both Instances
- Create Aliases for AdventureWorks and Proseware
- Ensure SQL Browser is Disabled and Configure a Fixed TCP/IP Port
- Describe the SQL Server Platform
- Work with SQL Server Tools

Module 2: Preparing Systems for SQL Server 2008 R2

This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.

Lessons

- Overview of SQL Server 2008 R2 Architecture
- Planning Server Resource Requirements
- Pre-installation Testing for SQL Server 2008 R2

Lab: Preparing Systems for SQL Server 2008 R2

- Adjust memory configuration
- Perform Pre-installation Stress Testing
- Check Specific I/O Operations
- Describe the SQL Server architecture
- Plan for server resource requirements
- Conduct pre-installation stress testing
Module 3: Installing and Configuring SQL Server 2008 R2
This module details installing and configuring SQL Server 2008 R2.

Lessons
- Preparing to Install SQL Server 2008 R2
- Installing SQL Server 2008 R2
- Upgrading and Automating Installation

Lab: Installing and Configuring SQL Server 2008 R2
- Review installation requirements
- Install the SQL Server instance
- Perform Post-installation Setup and Checks
- Configure Server Memory
- Prepare to install SQL Server
- Install SQL Server
- Upgrade and automate the installation of SQL Server

Module 4: Working with Databases
This module describes the system databases, the physical structure of databases and the most common configuration options related to them.

Lessons
- Overview of SQL Server Databases
- Working with Files and Filegroups
- Moving Database Files

Lab: Working with Databases
- Adjust tempdb configuration
- Create the RateTracking database
- Attach the OldProspects database

Module 5: Understanding SQL Server 2008 R2 Recovery Models
This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server 2008 R2.

Lessons
- Backup Strategies
- Understanding SQL Server Transaction Logging
- Planning a SQL Server Backup Strategy

Lab: Understanding SQL Server 2008 R2 Recovery Models
- Plan a backup strategy
- Configure recovery models
- Review recovery models and strategy
- Describe the critical concepts surrounding backup strategies
- Explain the transaction logging capabilities within the SQL Server database engine
- Plan a SQL Server backup strategy

Module 6: Backup of SQL Server 2008 R2 Databases
This module describes SQL Server 2008 R2 Backup and the backup types.

Lessons
- Backing up Databases and Transaction
Logs
- Managing Database Backups
- Working with Backup Options

Lab : Backup of SQL Server 2008 R2 Databases
- Investigate backup compression
- Transaction log backup
- Differential backup
- Copy only backup
- Partial backup
- Back up databases and transaction logs
- Manage database backups
- Work with more advanced backup options

Module 7: Restoring SQL Server 2008 R2 Databases
This module describes the restoration of databases

Lessons
- Understanding the Restore Process
- Restoring Databases
- Working with Point-in-time Recovery
- Restoring System Databases and Individual Files

Lab : Restoring SQL Server 2008 R2 Databases
- Determine a restore strategy
- Restore the database
- Using STANDBY mode
- Understand the restore process
- Restore databases
- Work with Point-in-time Recovery
- Restore system databases and individual files

Module 8: Importing and Exporting Data
This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.

Lessons
- Transferring Data To/From SQL Server 2008 R2
- Importing & Exporting Table Data
- Inserting Data in Bulk

Lab : Importing and Exporting Data
- Import the Excel spreadsheet
- Import the CSV file
- Create and test an extraction package
- Compare loading performance
- Transfer data to and from SQL Server
- Import and export table data
- Insert data in bulk and optimize the bulk insert process

Module 9: Authenticating and Authorizing Users
This module covers SQL Server 2008 R2 security models, logins and users.

Lessons
- Authenticating Connections to SQL Server
- Authorizing Logins to Access Databases
- Authorization Across Servers

Lab : Authenticating and Authorizing Users
- Create Logins
- Correct an Application Login Issue
- Create Database Users
- Correct Access to Restored Database
• Describe how SQL Server authenticates connections
• Describe how logins are authorized to access databases
• Explain the requirements for authorization across servers

Module 10: Assigning Server and Database Roles

This module covers fixed server roles, fixed database roles and user-defined database roles.

Lessons

• Working with Server Roles
• Working with Fixed Database Roles
• Creating User-defined Database Roles

Lab : Assigning Server and Database Roles

• Assign Server Roles
• Assign Fixed Database Roles
• Create and Assign User-defined Database Roles
• Check Role Assignments

• Work with server roles
• Work with fixed database roles
• Create user-defined database roles

Module 11: Authorizing Users to Access Resources

This module covers permissions and the assignment of permissions.

Lessons

• Authorizing User Access to Objects
• Authorizing Users to Execute Code
• Configuring Permissions at the Schema Level

Lab : Authorizing Users to Access Resources

• Assign Schema-level Permissions
• Assign Object-level Permissions
• Test Permissions

• Authorize user access to objects
• Authorize users to execute code
• Configure permissions at the schema level

Module 12: Auditing SQL Server Environments

This module covers SQL Server Audit.

Lessons

• Options for Auditing Data Access in SQL Server
• Implementing SQL Server Audit
• Managing SQL Server Audit

Lab : Auditing SQL Server Environments

• Determine audit configuration and create audit Create server audit specifications Create database audit specifications Test audit functionality

• Describe the options for auditing data access in SQL Server
• Implement SQL Server Audit
• Manage SQL Server Audit

Module 13: Automating SQL Server 2008 R2 Management

This module covers SQL Server Agent, jobs and job history.

Lessons

• Automating SQL Server Management
• Working with SQL Server Agent
• Managing SQL Server Agent Jobs
Lab: Automating SQL Server 2008 R2 Management

- Create a Data Extraction Job
- Schedule the Data Extraction Job
- Troubleshoot a Failing Job
- Automate SQL Server Management
- Work with SQL Server Agent
- Manage SQL Server Agent jobs

Module 14: Configuring Security for SQL Server Agent

This module covers SQL Server agent security, proxy accounts and credentials.

Lessons

- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

Lab: Configuring Security for SQL Server Agent

- Troubleshoot job execution failure
- Resolve the security issue
- Perform further troubleshooting
- Explain SQL Server Agent security
- Configure credentials
- Configure Proxy accounts

Module 15: Monitoring SQL Server 2008 R2 with Alerts and Notifications

This module covers the configuration of database mail, alerts and notifications.

Lessons

- Configuration of Database Mail
- Monitoring SQL Server Errors
- Configuring Operators, Alerts and Notifications

Lab: Monitoring SQL Agent Jobs with Alerts and Notifications

- Configure Database Mail
- Implement Notifications
- Implement Alerts
- Configure database mail
- Monitor SQL Server errors
- Configure operators, alerts and notifications

Module 16: Performing Ongoing Database Maintenance

This module covers database maintenance plans.

Lessons

- Ensuring Database Integrity
- Maintaining Indexes
- Automating Routine Database Maintenance

Lab: Ongoing Database Maintenance

- Check database integrity using DBCC CHECKDB
- Correct index fragmentation
- Create a database maintenance plan
- Investigate table lock performance
- Ensure database integrity
- Maintain indexes
- Automate routine database maintenance

Module 17: Tracing Access to SQL Server 2008 R2

This module covers SQL Profiler and SQL Trace stored procedures.
Module 18: Monitoring SQL Server 2008 R2
This module introduces DMVs and the configuration of data collection.

Lessons

- Monitoring Activity
- Capturing and Managing Performance Data
- Analyzing Collected Performance Data

Lab : Monitoring SQL Server 2008 R2

- Investigating DMVs
- Configure Management Data Warehouse
- Configure Instances for Data Collection
- Work with Data Collector Reports
- Monitor current activity
- Capture and manage performance data

Module 19: Managing Multiple Servers
This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.

Lessons

- Working with Multiple Servers
- Virtualizing SQL Server
- Deploying and Upgrading Data-Tier Applications

Lab : Managing Multiple Servers

- Configure CMS and execute multi-server queries
- Deploy a data-tier application
- Register and extract a data-tier application
- Upgrade a data-tier application
- Work with multiple servers
- Describe options for virtualizing SQL Server
- Deploy and upgrade Data-Tier Applications

Module 20: Troubleshooting Common SQL Server 2008 R2 Administrative Issues
This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.

Lessons

- SQL Server Troubleshooting Methodology
- Resolving Service-related Issues
- Resolving Concurrency Issues
• Resolving Login and Connectivity Issues

Lab: Troubleshooting Common Issues

• Troubleshoot and resolve SQL Server administrative issues
• Explain SQL Server troubleshooting methodology
• Resolve service-related issues
• Resolve concurrency issues
• Resolve login and connectivity issues
Microsoft Course 6292A

Course Length: 3 days

Installing and Configuring Windows 7

Before attending this course, students must have:

- Experience installing PC hardware and devices.
- Basic understanding of TCP/IP and networking concepts.
- Basic Windows and Active Directory knowledge.
- The skills to map network file shares.
- Experience working from a command prompt.
- Basic knowledge of the fundamentals of applications. For example, how client computer applications communicate with the server.
- Basic understanding of security concepts such as authentication and authorization.
- An understanding of the fundamental principles of using printers.

Course Outline

Module 1: Installing, Upgrading, and Migrating to Windows 7. This module explains how to install, upgrade and migrate to Windows 7. It also describes the key features, editions, and hardware requirements of Windows 7.

Lessons

- Preparing to Install Windows 7
- Performing a Clean Installation of Windows 7
- Upgrading and Migrating to Windows 7
- Performing Image-based Installation of Windows 7
- Configuring Application Compatibility

Lab: Installing and Configuring Windows 7

- Migrating Settings by using Windows Easy Transfer
- Configuring a Reference Image of Windows 7
Configuring a Reference Image

After completing this module, students will be able to:

- Describe the key features, editions, and hardware requirements of Windows 7.
- Perform a clean installation of Windows 7.
- Upgrade and Migrate to Windows 7 from an earlier version of Windows.
- Perform an image-based installation of Windows 7.
- Resolve common application compatibility issues.

**Module 2: Configuring Disks and Device Drivers.** This module examines how to configure disks, partitions, volumes, and device drivers to enable Windows 7 to function as desired.

**Lessons**

- Partitioning Disks in Windows 7
- Managing Disk Volumes
- Maintaining Disks in Windows 7
- Installing and Configuring Device Drivers

**Lab: Configuring Disks and Device Drivers**

- Configuring Disks
- Configuring Disk Quotas (Optional)
- Updating a Device Driver

After completing this module, students will be able to:

- Configure disk partitions on a Windows 7 client computer
- Create and manage disk volumes
- Manage file system fragmentation and disk quotas
- Install and configure device drivers

**Module 3: Configuring File Access and Printers on Windows 7 Client Computers.** This module explains how to manage access to shared folders and printers on a computer running Windows 7. Specifically, it describes how to share and secure folders, configure folder compression, and how to install, configure, and administer printing.

**Lessons**

- Overview of Authentication and Authorization
- Managing File Access in Windows 7
Managing Shared Folders
Configuring File Compression
Managing Printing

Lab: Configuring File Access and Printers on Windows 7 Client Computers

Create and Configure a Public Shared Folder for all Users
Configuring Shared Access to Files for Specific Users
Creating and Sharing a Printer

After completing this module, students will be able to:

Describe authentication and authorization
Manage file access on a Windows 7 client computer
Create and manage shared folders
Configure file compression
Install, configure, and administer printers

Module 4: Configuring Network Connectivity. This module explains both IPv4 and IPv6 network connectivity. It also describes how to implement automatic IP Address Allocation and troubleshoot network connectivity.

Lessons

Configuring IPv4 Network Connectivity
Configuring IPv6 Network Connectivity
Implementing Automatic IP Address Allocation
Overview of Name Resolution
Troubleshooting Network Issues

Lab: Configuring Network Connectivity

Configuring IPv4 Addressing
Configuring IPv6 Addressing
Troubleshooting Network Connectivity

After completing this module, students will be able to:

Configure IPv4 network connectivity.
Configure IPv6 network connectivity.
Implement automatic IP address allocation.
Troubleshoot common network related issues by using the tools available in Windows 7.

Module 5: Configuring Wireless Network Connections. This module describes key wireless network technologies and how to configure wireless network components and the Windows 7 elements that are necessary to access wireless networks.

Lessons

Overview of Wireless Networks
Configuring a Wireless Network

Lab : Configuring Wireless Network Connections

Determining the appropriate configuration for a wireless network
Troubleshooting Wireless Connectivity

After completing this module, students will be able to:

Describe the standards and technologies related to wireless network connections.
Configure a wireless network connection.

Module 6: Securing Windows 7 Desktops. This module describes how to make a Windows 7 computer more secure while ensuring usability is not sacrificed in the process. Specifically, it describes Windows Firewall, User Account Control, Windows Defender, and Security in Internet Explorer 8.

Lessons

Overview of Security Management in Windows 7
Securing a Windows 7 Client Computer by Using Local Security Policy Settings
Securing Data by Using EFS and BitLocker
Configuring Application Restrictions
Configuring User Account Control
Configuring Windows Firewall
Configuring Security Settings in Internet Explorer 8
Configuring Windows Defender

Lab : Configuring UAC, Local Security Policies, EFS, and AppLocker

Using Action Center
Configuring Local Security Policies
Encrypting Data
Configuring AppLocker

**Lab: Configuring Windows Firewall, Internet Explorer 8 Security Settings, and Windows Defender**

- Configuring Windows Firewall
- Configuring Internet Explorer 8 Security
- Configuring Windows Defender

After completing this module, students will be able to:

- Explain the security management features of Windows 7.
- Configure local security policy settings on a Windows 7 client computer.
- Secure data by using EFS and BitLocker.
- Configure application restrictions by using AppLocker.
- Configure user account control settings.
- Configure Windows Firewall on a Windows 7 client computer.
- Configure security-related settings in Internet Explorer to help protect a Windows 7 client computer that is connected to the Internet.
- Configure Windows Defender to help protect a Windows 7 client computer against malicious software.

**Module 7: Optimizing and Maintaining Windows 7 Client Computers.** This module describes how to use the monitoring and configuration tools to obtain information about Windows 7 performance and how to troubleshoot performance and reliability problems.

**Lessons**

- Maintaining Performance by Using the Windows 7 Performance Tools
- Maintaining Reliability by Using the Windows 7 Diagnostic Tools
- Backing Up and Restoring Data by Using Windows Backup
- Restoring a Windows 7 System by Using System Restore Points
- Configuring Windows Update

**Lab: Optimizing and Maintaining Windows 7 Client Computers**

- Monitoring System Performance
- Backing Up and Restoring Data
- Configuring System Restore Points
- Configuring Windows Update
After completing this module, students will be able to:

- Maintain the performance of a Windows 7 client computer by using performance management tools.
- Maintain reliability of a Windows 7 client computer by using the diagnostic tools.
- Back up and restore data on a Windows 7 client computer by using Windows Backup.
- Restore a Windows 7 system by using system restore points.
- Configure Windows Update on a Windows 7 client computer.

**Module 8: Configuring Mobile Computing and Remote Access in Windows 7.** This module explains how to configure mobile devices and remote access. It also discusses DirectAccess and BranchCache which are new for Windows 7.

**Lessons**

- Configuring Mobile Computer and Device Settings
- Configuring Remote Desktop and Remote Assistance for Remote Access
- Configuring DirectAccess for Remote Access
- Configuring BranchCache for Remote Access

**Lab : Configuring Mobile Computing and Remote Access in Windows 7**

- Creating a Sync Partnership
- Configuring Power Options
- Enabling Remote Desktop
- Enabling BranchCache

After completing this module, students will be able to:

- Configure mobile computer and device settings on a Windows 7 client computer.
- Configure Remote Desktop and Remote Assistance on a Windows 7 client computer.
- Configure DirectAccess on a Windows 7 client computer for remote access.
- Configure BranchCache on a branch office Windows 7 client computer.
Core Solutions of MS SharePoint Server 2013  
Course#: MS20331

Length: 5 Days  
Audience: IT Professionals  
Level: 300  
Technology: MS SharePoint Server 201  
Type: Hands-On course  
Delivery Method: Instructor-led Classroom

About this Course

This course will provide you with the knowledge and skills to configure and manage a MS SharePoint Server 2013 environment. This course will teach you how to configure SharePoint Server 2013, as well as provide guidelines, best practices, and considerations that will help you optimize your SharePoint server deployment. This is the first in a sequence of two courses for IT Professional and will align with the first exam in the SharePoint Server 2013 IT Pro certification.

Audience Profile

The course is targeted at experienced IT Professionals interested in learning how to install, configure, deploy and manage SharePoint Server 2013 installations in either the data center or the cloud. Students typically have more than four years of hands-on experience planning and maintaining SharePoint and other core technologies upon which SharePoint depends, including Windows Server 2008 R2 or later, Internet Information Services (IIS), SQL Server 2008 R2 or later, Active Directory, and networking infrastructure services.

The minimally qualified candidate typically:

- Is an IT professional who plans, implements, and maintains a multi-server deployment of SharePoint Server 013.
- Has a working knowledge of, and preferably hands-on experience, with SharePoint Online.
- Has broad familiarity with SharePoint workloads.
- Have experience with business continuity management, including data backup, restoration, and high availability.
- Has experience with authentication and security technologies
- Has experience with Windows PowerShell.
- Hands-on experience or job experience is considered a solutions-based role where the candidate works within the solutions space covered by SharePoint, working on multiple solutions in the SharePoint space that includes document management, content management, and search.

The secondary audience for this course are Business Application Administrators (BAAs) who are engaged in the administering line-of-business (LOB) projects in conjunction with internal business customers would benefit from an understanding of how to manage SharePoint Server 2013. Administrators who are entirely new to SharePoint will gain some benefit from the course, but it is recommended that they familiarize themselves with the basic concepts of the SharePoint platform before attending.

At Course Completion

After completing this course, students will be able to:

- Describe the key features of SharePoint 2013
- Design an information architecture
- Design logical and physical architectures
- Install and configure SharePoint Server 2013
- Create web applications and site collections
- Plan and configure service applications
- Manage users and permissions
- Configure authentication for SharePoint 2013
- Secure a SharePoint 2013 deployment
- Manage taxonomy
- Configure user profiles
- Configure enterprise search
- Monitor and maintain a SharePoint 2013 environment

Prerequisite sites

An ideal candidate will have at least one year of experience with deploying and administering multiple SharePoint 2010 farms across a large enterprise. Because many customers skipped upgrading from SharePoint 2007, a candidate can also have at least 2 years of experience with SharePoint 2007 and knowledge of the differences between 2007 and 2010, particularly the Service Application model. A candidate can demonstrate the following skills:

- Deploying and managing applications native, virtually and in the cloud.
- Administering Internet Information Services (IIS).
Lab: Creating an Information Architecture

In this module, you will learn about the core elements of IA design and a range of storage, navigation, and retrieval options to maximize usability in a SharePoint 2013 environment. The integral use of metadata throughout SharePoint 2013 means that an IA designer has a range of storage, navigation, and retrieval options to maximize usability in a well-structured IA.

In this module, you will learn about the core features of SharePoint 2013, the new features in this version, and what has been removed. You will also learn about the basic structural elements of a farm deployment and how they fit together. Finally you will learn about the different deployment options available to SharePoint 2013.

Lessons
- Key Components of a SharePoint Deployment
- New Features in SharePoint 2013
- SharePoint 2013 Deployment Options

After completing this module, students will be able to:
- Identify the capabilities and architecture of SharePoint 2013.
- Identify new and deprecated features in SharePoint 2013.
- Identify deployment options for SharePoint 2013.

Module 2: Designing an Information Architecture

Information architecture (IA) defines the structures by which an organization catalogs information. Designing an IA requires a detailed understanding of the information held in an organization and its usage, context, volatility, and governance. A good IA rationalizes the creation and storage of content and streamlines its surfacing and use.

IA design should be platform-neutral, but it must also be driven by the functionality of its environment. Microsoft SharePoint Server 2013 provides a rich and functional platform for the development and implementation of efficient and effective IA structures. The integral use of metadata throughout SharePoint 2013 means that an IA designer has a range of storage, navigation, and retrieval options to maximize usability in a well-structured IA.

In this module, you will learn about the core elements of IA design and the facilities and devices available in SharePoint 2013 to deploy an effective information management solution.

Lessons
- Identifying Business Requirements
- Understanding Business Requirements
- Organizing Information in SharePoint 2013
- Planning for Discoverability

Lab: Creating an Information Architecture – Part One
- Identifying Site Columns and Content Types

Lab: Creating an Information Architecture – Part Two
- Designing a Business Taxonomy

Module 3: Designing a Logical Architecture

This module reviews the logical constructs of Microsoft SharePoint Server 2013 and SharePoint Online. It discusses the importance of creating a logical architecture design based on business requirements before you implement a solution. The module covers conceptual content, defining a logical architecture, and the components of Microsoft SharePoint Server 2013 that you must map to business specifications.

Lessons
- Overview of SharePoint 2013 Logical Architecture
- Documenting Your Logical Architecture

Lab: Designing A Logical Architecture
- Plan a Logical Architecture
- Produce a Logical Architecture Diagram

After completing this module, students will be able to:
- Map business requirements to SharePoint 2013 architecture components.
- Explain the importance of documentation and describe the options for documenting logical architecture.

Module 4: Designing a Physical Architecture

When you design a Microsoft SharePoint Server 2013 deployment, you must carefully consider the hardware and farm topology requirements. Your choices of server hardware and the number of servers that you specify for the farm can have a significant impact on how the farm meets user requirements, how users perceive the SharePoint solution, and how long before the farm requires additional hardware.

This module describes the factors that you should consider when you design the physical architecture of a SharePoint 2013 deployment. The physical architecture refers to the server design, farm topology, and supporting elements—such as network infrastructure—for your deployment. This physical architecture underpins the operations of your SharePoint 2013 environment, so it is essential that your physical design fully meets the operational requirements.

Lessons
- Designing Physical Components for SharePoint deployments
- Designing Supporting Components for SharePoint Deployments
- SharePoint Farm Topologies
- Mapping a Logical Architecture Design to a Physical Architecture Design

Lab: Designing a Physical Architecture
- Designing a physical architecture
- Develop a physical architecture design diagram
Module 5: Installing and Configuring SharePoint Server 2013

After you design and plan your logical and physical architectures for a Microsoft SharePoint Server 2013 deployment, the next installation steps are to implement the deployment design and specify configuration settings for the deployment.

In this module, you will learn about installing SharePoint 2013 in various topologies. You will learn how to configure farm settings, and how to script the installation and configuration of SharePoint 2013.

Lessons
- Installing SharePoint Server 2013
- Scripting Installation and Configuration
- Configuring SharePoint Server 2013 Farm Settings

Lab: Deploying and Configuring SharePoint Server 2013 – Part One
- Provisioning a SharePoint 2013 Server Farm

Lab: Configuring SharePoint Server 2031 Farm Settings
- Configuring SharePoint Server 2013 Farm Settings
- Configuring Outgoing Email
- Configuring Integration with Office Web Apps Server 2013

After completing this module, students will be able to:
- Install SharePoint 2013
- Configure SharePoint 2013 farm settings.
- Script the installation and configuration of SharePoint 2013.

Module 6: Creating Web Applications and Site collections

After installing your Microsoft SharePoint Server 2013 farm, you are ready to begin deploying sites and content, such as an organizational intranet site.

In this module, you will learn about the key concepts and skills related to the logical architecture of SharePoint including web applications, site collections, sites, and content databases. Specifically, you will learn how to create and configure web applications and to create and configure site collections.

Lessons
- Creating Web Applications
- Configuring Web Applications
- Creating and Configuring Site Collections

Lab: Creating and Configuring Web Applications
- Creating a Web Application
- Configuring a Web Application

Lab: Creating and Configuring Site Collections
- Creating Site Collections
- Creating Site Collections in New Content Databases
- Creating a Warm-up Script

Module 7: Planning and Configuring Service Applications

Service applications were introduced in Microsoft SharePoint Server 2010, replacing the Shared Service Provider architecture of Microsoft Office SharePoint Server 2007. Service applications provide a flexible design for delivering services, such as Managed Metadata or Performance Point, to users who need them. Microsoft SharePoint Server 2013 includes more than 20 services, some of which are new to this version, whereas others are enhanced. In planning and configuring service applications, it is important that you understand the dependencies, resource usage, and business requirements for each.

This module reviews the basic service application architecture, the essentials of planning your service application deployment, and the configuration of your service applications. This module does not discuss sharing, or federation, of service applications. This is covered in more detail in course 20332B: Advanced Solutions of Microsoft SharePoint Server 2013

Lessons
- Provisioning a Managed Metadata Service application with Central Administration
- Provisioning a Managed Metadata Service Application with Windows PowerShell
- Configuring Service Applications for Document Conversions
- Configuring Service Application Proxy Groups

After completing this module, students will be able to:
- Explain the key components and topologies for SharePoint Server 2013 service application architecture
- Describe how to provision and manage SharePoint 2013 service applications.

Module 8: Managing Users and Permissions

Many organizations need to store sensitive or confidential information. Microsoft SharePoint Server 2013 includes a complete set of security features, which you can use to help ensure that users with the appropriate rights and permissions can access the information they need, can modify the data they are responsible for, but that they cannot view or modify confidential information, or information that is not intended for them. The SharePoint 2013 security model is highly flexible and adaptable to your organization’s needs.

In this module, you will learn about the various authorization and security features available in SharePoint 2013 to help you maintain a secure SharePoint environment. Specifically, you will be learning about authorization and permissions in SharePoint 2013, and how to manage access to content in SharePoint 2013.

Lessons
- Authorization in SharePoint 2013
- Managing Access to Content

Lab: Managing Users and Groups
- Creating a Web Application Policy
Creating and Managing SharePoint Groups
Creating Custom Permission Levels

Lab: Securing Content in SharePoint Sites
Managing Permissions and Inheritance
Managing Site Collection Security
Enable anonymous access to a site

After completing this module, students will be able to:
Understand and manage authorization and permissions in SharePoint 2013
Manage access to content in SharePoint 2013

Module 9: Configuring Authentication for SharePoint 2013

Authentication is the process by which you establish the identity of users and computers. Authorization controls access to resources by assigning permissions to users and computers. To provide authorization to consumers of Microsoft SharePoint content and services, whether they are end users, server platforms, or SharePoint apps, you first need to verify that they are who they claim to be. Together, authentication and authorization play a central role in the security of a SharePoint 2013 deployment by ensuring that consumers can only access resources to which you have explicitly granted them access.

In this module, you will learn about the authentication infrastructure in SharePoint 2013. You will learn how to configure SharePoint to work with a variety of authentication providers, and you will learn how to configure authenticated connections between SharePoint and other server platforms.

Lessons
• Overview of Authentication
• Configuring Federated Authentication
• Configuring Server-to-Server Authentication

Lab: Configuring SharePoint 2013 to Use Federated Identities
Configuring AD FS to Make the Web Application a Relying Party
Configuring SharePoint to Trust AD FS as an Identity Provider
Configuring the Web Application to Use the AD FS Identity Provider

After completing this module, students will be able to:
Explain the authentication infrastructure of SharePoint 2013
Configure claims providers and identity federation for SharePoint 2013
Configure Server-to-server authentication for SharePoint 2013

Module 10: Securing a SharePoint 2013 Deployment

Microsoft SharePoint Server 2013 is not just a group of websites—it is also a site-provisioning engine for intranets, extranets, and Internet sites, a collection of databases, an application platform, and a platform for collaboration and social features, as well as being many other things. In addition to it touching your network, it also touches your line-of-business (LOB) applications and Microsoft Active Directory; therefore, it has a large attack surface to consider and protect. SharePoint 2013 is supplied with several security features and tools out-of-the-box to help you secure it.

In this module, you will learn how to secure and harden your SharePoint 2013 farm deployment and how to configure several security settings at the farm level.

Lessons
• Securing the Platform

• Configuring Farm-Level Security

Lab: Hardening a SharePoint 2013 Server Farm
• Configuring SharePoint and SQL Server to Communicate over non-standard ports
• Configuring firewalls for SharePoint Server Farms

Lab: Configuring Farm-Level Security
• Configuring Blocked File Types
• Configuring Web Part Security
• Implementing Security Auditing

After completing this module, students will be able to:
• Secure the SharePoint 2013 Platform
• Configure farm-level security in SharePoint 2013

Module 11: Managing Taxonomy

In order to organize information and make that information easier to find and work with, you can label or categorize information. With files and items in Microsoft SharePoint, you can apply metadata, which could be a category, a classification, or a tag, in order to organize your content and make it easier to work with.

In most organizations, the most effective way to implement metadata is through a defined taxonomy that you have standardized through stakeholder input. This enables users to select metadata terms from a predefined list, which provides standard results.

Microsoft SharePoint Server 2013 can further enhance the application of metadata by using content types. Organizations can use content types to standardize specific types of files, documents, or list items and include metadata requirements, document templates, retention settings, and workflow directly.

Lessons
• Managing Content Types
• Understanding Term Stores and Term Sets
• Managing Term Stores and Term Sets

Lab: Configuring Content Type Propagation
• Creating Content Types for Propagation
• Publishing Content Types Across Site Collections

Lab: Configuring and Using Managed Metadata Term Sets
• Configuring the Managed Metadata Service
• Creating Term sets and Terms
• Consuming Term sets

After completing this module, students will be able to:
• Describe the function of content types and explain how to apply them to business requirements
• Describe the function of managed metadata in SharePoint 2013
• Configure the Managed Metadata Service and supporting components

Module 12: Configuring User Profiles

Social computing environments enable organizations to quickly identify colleagues, team members, and others with similar roles or requirements in an organization. Social features in Microsoft SharePoint Server 2013 enable users to quickly gain updates and insight into how other members of the organization are working and what information or processes people are developing, along with the progress being achieved.
The SharePoint 2013 social platform is based around the capabilities provided by the user profile service application, supported by other services, such as the Managed Metadata Service and the Search service. The User Profile Service provides configuration and control over importing profile data, creating My Sites, managing audiences, and users can utilize these features.

Lessons

- Configuring the user profile service application
- Managing User profiles and audiences

Lab: Configuring User Profiles

- LESSON ITEMS - STYLE =LIST PARAGRAPH LVL1

Lab: Configuring User Profiles

- Creating a User Profile Service Application
- Configuring Directory Import

Lab: Configuring My Sites and Audiences

- Configuring My Sites
- Configuring Audiences

After completing this module, students will be able to:

- Plan for and configure user profile synchronization with Active Directory Domain Services
- Plan for and configure My Sites and audiences

Module 13: Configuring Enterprise Search

Search has been a cornerstone of Microsoft SharePoint Products and Technologies since SharePoint Portal Server 2003. Since those early days, the architecture of the search service has evolved through the Shared Service Provider architecture to the service application architecture of SharePoint Server 2010. It has also grown with the addition of FAST technologies. SharePoint Server 2013 continues this growth by re-architecting the service and integrating many of the components that were intrinsic to FAST Search to deliver a more robust and richer experience for IT staff and users.

In this module, you will learn about the new architecture of the Search service, how to configure the key components of search, and how to manage search functionality in your organization.

Lessons

- Understanding the search service architecture
- Configuring Enterprise Search
- Managing Enterprise Search

Lab: Configuring Enterprise Search

- Configuring the search Service Application
- Configuring a File Share Content Source
- Configuring a Local SharePoint Content Source
- Creating a Search Center

Lab: Configuring the Search Experience

- Optimizing Search Results
- Customizing the Search Experience

After completing this module, students will be able to:

- Describe the core architecture of the Search service and its supported topologies
- Explain the steps required to configure the Search service in an enterprise environment.
- Describe how to manage and maintain a well-performing Search environment.

Module 14: Monitoring and Maintaining a SharePoint 2013 Environment

Careful planning and configuration alone will not guarantee an effective Microsoft SharePoint Server 2013 deployment. To keep your SharePoint 2013 deployment performing well, you need to plan and conduct ongoing monitoring, maintenance, optimization, and troubleshooting.

In this module, you will learn how to plan and configure monitoring in a SharePoint 2013 server farm, and how to tune and optimize the performance of your farm on an ongoing basis. You will also learn how to use a range of tools and techniques to troubleshoot unexpected problems in your SharePoint 2013 deployments.

Lessons

- Monitoring a SharePoint 2013 Environment
- Tuning and Optimizing a SharePoint Environment
- Planning and Configuring Caching
- Troubleshooting a SharePoint 2013 Environment

Lab: Monitoring a SharePoint 2013 Deployment

- Configuring Usage and Health Data Collection
- Configuring SharePoint Diagnostic Logging
- Configuring Health Analyzer Rules
- Reviewing Usage and Health Data

Lab: Investigating Page Load Times

- Investigating Page Load Times
- Analyzing SharePoint Page Performance

After completing this module, students will be able to:

- Develop and implement a monitoring plan for a SharePoint 2013 environment
- Tune and optimize a SharePoint 2013 server farm on an ongoing basis
- Plan and configure caching to improve the performance of a SharePoint 2013 deployment
- Troubleshoot errors and other issues in a SharePoint 2013 deployment
Advanced Solutions of Microsoft SharePoint Server 2013
Course#: MS 20332

About this Course

This five-day course examines how to plan, configure, and manage a Microsoft SharePoint Server 2013 environment. Special areas of focus include implementing high availability, disaster recovery, service application architecture, Business Connectivity Services, social computing features, productivity and collaboration platforms and features, business intelligence solutions, enterprise content management, web content management infrastructure, solutions, and apps. The course also examines how to optimize the Search experience, how to develop and implement a governance plan, and how to perform an upgrade or migration to SharePoint Server 2013.

Audience Profile

The course track is targeted at experienced IT Professionals interested in learning how to install, configure, deploy and manage SharePoint Server 2013 installations in either the data center or cloud. In addition, Business Application Administrators (BAAs) who are engaged in the administering line-of-business (LOB) projects in conjunction with internal business customers would benefit from understanding of managing SharePoint Server 2013.

The training addresses three audiences:
- Existing SharePoint 2010 customers and partners who need to understand the major changes in SharePoint 2013. In addition there have been other improvements in tools and methodologies.
- Customer who are new to SharePoint. SharePoint market size is growing significantly and is expected to continue to grow, so there are many new customers with no previous experience.
- Customers running a previous version of SharePoint (SharePoint 2003 and SharePoint 2007) which did not upgrade to SharePoint 2010, so are not familiar with the architecture of SharePoint 2010 or SharePoint Server 2013.

At Course Completion

After completing this course, students will be able to:

- Describe the core features of SharePoint 2013
- Plan and design a SharePoint 2013 environment to meet requirements for high availability and disaster recovery
- Plan and implement a service application architecture for a SharePoint 2013 deployment
- Configure and manage Business Connectivity Services features in a SharePoint 2013 deployment
- Plan and configure social computing features
- Plan and configure productivity and collaboration platforms and features
- Plan and configure Business Intelligence solutions
- Optimize the search experience for an enterprise environment
- Plan and configure enterprise content management in a SharePoint 2013 deployment
- Plan and configure a web content management infrastructure to meet business requirements
- Manage solutions in a SharePoint 2013 deployment
- Configure and manage apps in a SharePoint Server 2013 environment
- Develop and implement a governance plan for SharePoint Server 2013
- Perform an upgrade or migration to SharePoint Server 2013

Prerequisits

Before attending this course, students must have:
- Completed Course 20331: Core Solutions of Microsoft SharePoint Server 2013, successful completion of Exam 70-331: Core Solutions of Microsoft SharePoint 2013, or equivalent skills.
- At least one year’s experience of mapping business requirements to logical and physical technical design.
- Working knowledge of network design, including network security.
- Experience managing software in a Windows 2008 R2 enterprise server or Windows Server 2012 environment.
- Deployed and managed applications natively, virtually, and in the cloud.
Lessons

- Core Components of the SharePoint 2013 Architecture
- New Features in SharePoint Server 2013
- SharePoint Server 2013 and SharePoint Online Editions

Lab: Reviewing Core SharePoint Concepts

- Configuring SharePoint Server 2013 Farms
- Creating and Configuring Site Collections and Sites

After completing this module, students will be able to:

- Describe the architectural features of SharePoint Server 2013
- Identify new and deprecated features in SharePoint 2013
- Describe the editions for SharePoint Server 2013 on-premise and SharePoint Online

Module 2: Designing Business Continuity Management Strategies

This module examines high availability and disaster recovery in SharePoint 2013. When designing high availability and disaster recovery strategies for a SharePoint farm, it is important to understand the different approaches required by each logical tier in the farm. High availability for the database tier requires understanding of how SQL Server provides high availability and the associated requirements. High availability for the application tier can be straightforward for some service applications, while other applications, such as Search, require additional planning and configuration for high availability. The web front end tier will also require additional planning and configuration for high availability, and architects should consider the new SharePoint 2013 request management feature. SharePoint farm disaster recovery has always required considerable planning and understanding of the necessary components and backup tools available. In this regard SharePoint 2013 is no different, and farm administrators should create a disaster recovery plan that states how content and configurations are backed up, how data can be restored, and what backup schedules are required.

Lessons

- Designing Database Topologies for High Availability and Disaster Recovery
- Designing SharePoint Infrastructure for High Availability
- Planning for Disaster Recovery

Lab: Planning and Performing Backups and Restores

- Create a Backup and Restore Plan

Module 3: Planning and Implementing a Service Application Architecture

Service applications were introduced in SharePoint 2010, replacing the Shared Service Provider architecture of Microsoft Office SharePoint Server 2007. Service applications provide a flexible design for delivering services, such as managed metadata or PerformancePoint, to users who need them. There are several deployment topologies available to you when you plan your service application implementation. These range from a simple, single-farm, single-instance service application model to more complex, cross-farm, multiple-instance designs. What remains most important is that you create a design that matches the needs of your organization's users in terms of performance, functionality, and security.

This module reviews the service application architecture, how to map business requirements to design, and the options for enterprise scale, federated service application architectures.

Lessons

- Planning Service Applications
- Designing and configuring a Service Application Topology
- Configuring Service Application Federation

Lab: Planning a Service Application Architecture

- Planning a Service Application Topology

Lab: Federating Service Applications between SharePoint Server Farms

- Creating a Service Application Instance
- Establishing Trust Relationships between SharePoint Farms
- Publishing and Consuming Service Applications

After completing this module, students will be able to:

- Explain the service application architecture
- Describe the fundamental options of service application design
- Describe how to configure a federated service application deployment

Module 4: Configuring and Managing Business Connectivity Services

Most organizations store information in a variety of disparate systems. In many cases, these organizations want to be able to view and interact with information from these disparate systems from a single interface. This reduces the need for information workers to constantly switch between systems and creates opportunities for power users or analysts to aggregate data from multiple sources.
In SharePoint 2013, Business Connectivity Services (BCS) is a collection of technologies that enable you to query, view, and interact with data from external systems. In this module, you will learn how to plan and configure various components of BCS.

**Lessons**
- Planning and Configuring Business Connectivity Services
- Configuring the Secure Store Service
- Managing Business Data Connectivity Models

**Lab: Configuring BCS and the Secure Store Service**
- Configuring the Business Data Connectivity Service Application
- Configuring the Secure Store Service

**Lab: Managing Business Data Connectivity Models**
- Configuring a Secure Store Service Target Application
- Importing and Configuring BDC Models

After completing this module, students will be able to:
- Plan and configure the Business Data Connectivity Service application
- Plan and configure the Secure Store Service application
- Manage Business Data Connectivity models

**Module 5: Connecting People**

Talking about connecting people in Microsoft SharePoint Server 2013 really means talking about taking people out of their isolated workspaces and giving them the ability and tools to collaborate with other people in the organization such as their work colleagues, peers, and executives. It is about finding people with expertise, and identifying shared interests and about creating networks of people that share common goals.

In this module, you will learn about the concepts and ways of connecting people in SharePoint 2013. You will examine user profiles and user profile synchronization, social interaction features and capabilities, and communities and community sites in SharePoint 2013.

**Lessons**
- Managing User Profiles
- Enabling Social Interaction
- Building Communities

**Lab: Configuring Profile Synchronization and My Sites**
- Configuring Profile Synchronization
- Configuring My Sites

**Lab: Configuring Community Sites**
- Creating a Community Site Infrastructure
- Configuring Community Site Participation

After completing this module, students will be able to:
- Understand and manage user profiles and user profile synchronization in SharePoint 2013
- Enable social interaction in SharePoint 2013
- Understand and build communities and community sites in SharePoint 2013

**Module 6: Enabling Productivity and Collaboration**

This module examines how SharePoint 2013 extends the ability of users to work more effectively and efficiently, and to collaborate across the organization. It also introduces features for managing user profiles and user profile synchronization, and for enabling users to participate in communities and community sites.

**Lessons**
- Aggregating Tasks
- Planning and Configuring Collaboration Features
- Planning and Configuring composites

**Lab: Configuring Project Sites**
- Creating Project Sites
- Configuring Project Sites
- Engaging Project Teams

**Lab: Configuring Workflow**
- Configure Windows Azure Workflow and SharePoint Workflow Services
- Creating and Testing a Workflow

After completing this module, students will be able to:
- Explain how the integration options for Exchange 2013 and Project Server 2013 improve task aggregation
- Describe how to plan and configure SharePoint collaborative and co-authoring options
- Describe how to plan and use workflows in SharePoint 2013

**Module 7: Planning and Configuring Business Intelligence**

Business Intelligence (BI) continues to be an important area for large enterprise organizations. The key to successful BI is the ability to integrate the components that deliver the right information, to the right people, at the right time. Microsoft SharePoint Server 2013 Enterprise Edition provides a range of integrated solutions that enable both users and administrators across an organization to develop BI solutions to fit their business requirements. These BI tools extend beyond SharePoint to provide consistent information management from personal data analysis environments, which use Microsoft Excel, through to departmental or organizational data repositories, which use SQL Server Reporting Services (SSRS) and SQL Server Analysis Services (SSAS).

In this module you will see how SharePoint 2013 can deliver BI solutions for your business.

**Lessons**
- Planning for Business Intelligence
- Planning, Deploying and Managing Business intelligence Services
- Planning and Configuring Advanced Analysis Tools

**Lab: Configuring Excel Services**
- Provisioning Excel Services
- Configuring External Data Access
- Configuring Data Connections

**Lab: Configuring PowerPivot and Power View for SharePoint**
- Configuring PowerPivot for SharePoint
- Configuring Power View for SharePoint

After completing this module, students will be able to:
- Explain the SharePoint BI architecture, its components, and how to identify BI opportunities in your organization
to work collaboratively and increase productivity through seamless
Module 8: Planning and configuring Enterprise Search

The Search service remains a cornerstone of the SharePoint platform’s success. In Microsoft SharePoint Server 2013 there have been major changes to the components that make up the service, to increase performance and configurability.

In this module, you will examine the configuration options in SharePoint Search that enable you to provide greater search result effectiveness by fine-tuning the service in various ways. The introduction of new functionality, such as result types and the increased move towards search-driven navigation mean that the role of the Search administrator has become even more important for business success. Search now enables you to delegate more of this management to site collection administrator and site owner levels, improving Search flexibility without increasing the administrative burden on a few Search service application administrators.

This module also examines Search analytics and reporting. To help you in your management of a Search environment, SharePoint 2013 now incorporates Search analytics and reporting into the Search service, rather than in a separate service application, as was the case in SharePoint Server 2010. The reports available will help you to monitor the service and optimize its configuration.

Lessons

- Configuring Search for an Enterprise Environment
- Configuring the Search Experience
- Optimizing Your Search

Lab: Planning an Enterprise Search Deployment

- Planning a Search Solution

Lab: Managing Search Relevance in SharePoint 2013

- Configuring a Thesaurus
- Configuring Entity Extractors and Refiners
- Configuring Query Spelling Correction
- Configuring Company Name Extraction

After completing this module, students will be able to:

- Describe the Search Service architecture and key areas of configuration
- Explain how to configure the Search service to improve the end-user experience
- Describe how to use analytics reports to optimize your Search environment

Module 9: Planning and Configuring Enterprise Content Management

This module examines Enterprise Content Management (ECM), which is a set of technologies and features that administrators use to provide some control over sites and content. This could include control over how information is stored, how long information is kept, how information is visible to users while in use, and how information growth is kept under control.

Planning support for your ECM requirements requires a clear understanding of content requirements and how that content supports the organization. This means that, as a best practice, many different organizational roles should have input into the ECM strategy and supporting features.

Lessons

- Planning Content Management
- Planning and Configuring eDiscovery
- Planning Records Management

Lab: Configuring eDiscovery in SharePoint Server 2013

- Creating and Configuring an eDiscovery Center
- Discovery and Preserving Content
- Querying and Exporting Content

Lab: Configuring Records Management in SharePoint Server 2013

- Configuring In-Place Records Management

After completing this module, students will be able to:

- Plan how to manage content and documents
- Plan and configure eDiscovery
- Plan records management and compliance

Module 10: Planning and Configuring Web Content Management

The web content management capabilities in Microsoft SharePoint Server 2013 can help an organization to communicate and integrate more effectively with employees, partners, and customers. SharePoint Server 2013 provides easy-to-use functionality to create, approve, and publish web content. This enables you to get information out quickly to intranet, extranet, and Internet sites and give your content a consistent look and feel. You can use these web content management capabilities to create, publish, manage, and control a large and dynamic collection of content.

As part of Enterprise Content Management (ECM) in SharePoint Server 2013, web content management can help to streamline your process for creating and publishing web sites.

Lessons

- Planning and Implementing a Web Content Management Infrastructure
- Configuring Managed Navigation and Catalog Sites
- Supporting Multiple Languages and Locales
- Enabling Design and Customization
- Supporting Mobile Users

Lab: Configuring Managed Navigation and Catalog Sites

- Configuring Product Catalog Sites
- Configuring Cross-Site Publishing
- Configuring Publishing Sites

Lab: Configuring Device Channels

- Configuring Device Channels

After completing this module, students will be able to:

- Plan and Configure a Web Content Management infrastructure to meet business requirements
- Configure managed navigation and product catalog sites
- Plan and configure support for multilingual sites
- Manage design and customization for publishing sites
- Plan and configure support for mobile users
Module 11: Managing Solutions in SharePoint Server 2013

As a SharePoint administrator, it is important to understand the features that are available in Microsoft SharePoint Server 2013. However, there are often specific functional requirements that may be part of SharePoint’s feature set but are not included in certain site templates. There may also be sites that require repeatable customization of lists or libraries, or custom code deployments that are necessary to add capabilities that are not available out-of-the-box. Developers use features and solutions to add and control these functionality requirements. Administrators, on the other hand, must understand how features and solutions are deployed and managed in order to meet user needs in a SharePoint farm.

Lessons
- Understanding the SharePoint Solution Architecture
- Managing Sandbox Solutions

Lab: Managing Solutions
- Configuring Sandboxed Solution Management at the Farm Level
- Configuring Sandboxed Solution Management at the Site Collection Level
- Deploying Farm Solutions

After completing this module, students will be able to:
- Describe and manage SharePoint features and solutions
- Managed sandboxed solutions in a SharePoint 2013 deployment

Module 12: Managing Apps for SharePoint Server 2013

SharePoint apps are new to Microsoft SharePoint Server 2013 and provide an additional capability to provide application functionality within the context of SharePoint. SharePoint apps supplement the capabilities of farm solutions and sandbox solutions, while providing a user experience that offers a measure of self-service customization capabilities without putting the stability or security of the farm at risk.

Lessons
- Understanding the SharePoint App Architecture
- Provisioning and Managing Apps and App Catalogs

Lab: Configuring and Managing SharePoint Apps
- Configuring a SharePoint Farm to Support Apps
- Creating and configuring a Corporate app Catalog
- Deploying and Monitoring apps

After completing this module, students will be able to:
- Describe SharePoint apps and the supporting SharePoint Infrastructure
- Provision and configure SharePoint apps and app catalogs
- Manage how apps are used within a SharePoint 2013 deployment

Module 13: Deploying a Governance Plan

Governance as it relates to SharePoint can be described as a way of controlling a SharePoint environment through the application of people, policies, and processes. Governance is necessary for all IT systems as a whole, and in particular for SharePoint deployments, which often introduce significant change in business processes, available functionality, and day-to-day working practices.

It is important to understand that governance must reflect the needs of the organization and how it should best use SharePoint. Therefore, the IT department cannot be the only body governing SharePoint; input must come from corporate sponsorship across the organization. The IT department must still act as the technical authority for SharePoint; however, this is just a single part of how SharePoint governance must be brought together from different parts of the organization.

Lessons
- Introduction to Governance Planning
- Key Elements of a Governance Plan
- Planning for Governance in SharePoint 2013
- Implementing Governance in SharePoint 2013

Lab: Developing a Plan for Governance
- Creating a Governance Plan

Lab: Managing Site Creation and Deletion
- Creating and Publishing site Policies
- Enabling and Managing Self-Service Site Creation

After completing this module, students will be able to:
- Describe the concepts of governance
- Describe the key elements of a governance plan
- Plan for governance in SharePoint Server 2013

Module 14: Upgrading and Migrating to SharePoint Server 2013

Upgrading your Microsoft SharePoint Server 2010 farm(s) to SharePoint 2013 is a major undertaking, so it is important that you carefully plan the upgrade activities. You need to ensure that your upgrade path—moving from version to version—is supported, that you have reviewed the business impact of your upgrade, and that you test your upgrade strategy to ensure business continuity. As with all such activities, preparation is crucial.

In contrast with earlier version of SharePoint, SharePoint 2013 supports only database-attach upgrades for content, but it now supports upgrades for some of the databases associated with service applications. You need to plan for these and ensure that you are prepared for any troubleshooting that may be required.

Another change in SharePoint 2013 is the approach to upgrading site collections. These are upgraded separately from the data and service applications. You can also delegate the upgrade tasks to site collection administrators.

Lessons
- Preparing the Upgrade for Migration Environment
- Performing the Upgrade Process
- Managing a Site Collection Upgrade

Lab: Performing a Database-Attach Upgrade
- Import the SharePoint 2010 Database
- Migrating and Upgrading a Service Application
- Migrating and Upgrading a Content Database

Lab: Managing Site Collection Upgrades
- Preparing Site Collections for Upgrade
- Upgrading Site Collections

After completing this module, students will be able to:
- Describe how to plan and prepare for your upgrade
• Explain the steps involved in data and service application upgrades
• Describe the process for upgrading Site Collections
This course will provide you with the knowledge and skills to plan, deploy, manage, secure, and support Microsoft Exchange Server 2013. This course will teach you how to configure Exchange Server 2013 and supply you with the information you will need to monitor, maintain, and troubleshoot Exchange Server 2013. This course will also provide guidelines, best practices, and considerations that will help you optimize performance and minimize errors and security threats in Exchange Server 2013.

Audience Profile

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. They are not expected to have experience with previous Exchange Server versions.

The secondary audience for this course will be candidates that are IT professionals who are looking to take the exam 70-341: Core Solutions of Microsoft Exchange Server 2013 as a standalone, or as part of the requirement for the Microsoft Certified Solutions Expert (MCSE) certification.

At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Server 2013.
- Plan for disaster mitigation; implement backup and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solution, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Before attending this course, students must have:

- Minimum of two years of experience working with Active Directory Domain Services (AD DS).
- Minimum of two years of experience working with name resolution, including DNS.
- Experience working with certificates, including PKI certificates.
Course Outline

Module 1: Deploying and Managing Microsoft Exchange Server 2013

This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.

Lessons
- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Lab: Deploying and Managing Exchange Server 2013

- Evaluating Requirements and Prerequisites for an Exchange Server 2013 Installation
- Deploying Exchange Server 2013
- Managing Exchange Server 2013

After completing this module, students will be able to:
- Describe Exchange Server 2013 prerequisites and requirements.
- Perform an Exchange Server 2013 deployment.
- Manage Exchange Server 2013.

Module 2: Planning and Configuring Mailbox Servers.

This module describes how to plan and configure the Mailbox server role.

Lessons
- Overview of the Mailbox Server Role
- Planning the Mailbox Server Deployment
- Configuring the Mailbox Servers

Lab: Configuring Mailbox Servers

- Planning Configuration for Mailbox Servers
- Configuring Storage on the Mailbox Servers
- Creating and Configuring Mailbox Databases

After completing this module, students will be able to:
- Describe the Mailbox server role.
- Plan for a Mailbox server role deployment.
- Configure the Mailbox servers.

Module 3: Managing Recipient Objects

This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons
- Managing Exchange Server 2013 Mailboxes
- Managing Other Exchange Recipients
- Planning and Implementing Public Folder Mailboxes
- Managing Address Lists and Policies

Lab: Managing Recipient Objects

- Configuring Trey Research Recipients
- Configuring Address Lists and Policies for Trey Research
- Configuring Public Folders for Trey Research

After completing this module, students will be able to:
- Manage Exchange Server 2013 mailboxes.
- Manage other Exchange Server 2013 recipients.
- Implement public folders.
- Configure address lists and policies.

Module 4: Planning and Deploying Client Access Servers

This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons
- Planning Client Access Server Deployment
- Configuring the Client Access Server Role
- Managing Client Access Services

Lab: Deploying and Configuring a Client Access Server Role

- Configuring Certificates for the Client Access Server
- Configuring Client Access Services Options
- Configuring Custom MailTips

After completing this module, students will be able to:
- Plan Client Access server deployment.
- Configure the Client Access server roles.
- Manage Client Access services.

Module 5: Planning and Configuring Messaging Client Connectivity

This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons
- Client Connectivity to the Client Access Server
- Configuring Outlook Web App
- Planning and Configuring Mobile Messaging
- Configuring Secure Internet Access for Client Access Server

Lab: Planning and Configuring Messaging Client Connectivity

- Planning Client Connectivity
- Configuring Outlook Web App and Outlook Anywhere
- Configuring Exchange ActiveSync
- Publishing Exchange Server 2013 through TMG 2010

After completing this module, students will be able to:
- Describe the client services Exchange Server 2013 provides.
- Configure Outlook Web App.
- Plan and configure mobile messaging.
- Configure secure Internet access for Client Access server.
Module 6: Planning and Implementing High Availability

This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Lab: Implementing High Availability

- Creating and Configuring a Database Availability Group
- Deploying Highly Available Client Access Servers
- Testing the High-Availability Configuration

After completing this module, students will be able to:

- Describe high availability in Exchange Server 2013.
- Configure highly available mailbox databases.
- Configure highly available Client Access servers.

Module 7: Planning and Implementing Disaster Recovery

This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Lab: Implementing Disaster Recovery for Exchange Server 2013

- Backing Up Exchange 2013
- Restoring Exchange Server 2013 Data

After completing this module, students will be able to:

- Plan disaster mitigation.
- Plan and implement Exchange Server 2013 backup.
- Plan and implement Exchange Server 2013 recovery.

Module 8: Planning and Configuring Message Transport

This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Lab: Planning and Configuring Message Transport

- Configuring Message Transport
- Troubleshooting Message Delivery
- Configuring Transport Rules and Data-Loss Prevention Policies

After completing this module, students will be able to:

- Describe message transport in Exchange Server 2013.
- Plan and configure message transport.
- Manage transport rules.

Module 9: Planning and Configuring Message Hygiene

This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Lab: Planning and Configuring Message Security

- Configuring Antimalware Options in Exchange Server 2013
- Configuring Anti-Spam Options on Exchange Server
- Validating Antimalware and Anti-Spam Configuration

After completing this module, students will be able to:

- Plan messaging security.
- Implement an antivirus solution for Exchange Server 2013.

Module 10: Planning and Configuring Administrative Security and Auditing

This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
- Configuring Audit Logging

Lab: Configuring Administrative Security and Auditing

- Configuring Exchange Server Permissions
- Configuring Audit Logging
- Configuring RBAC Split Permissions on Exchange Server 2013

After completing this module, students will be able to:

- Configure RBAC permissions.
- Configure audit logging.

Module 11: Monitoring and Troubleshooting Microsoft Exchange Server 2013

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
<table>
<thead>
<tr>
<th>Lab: Monitoring and Troubleshooting Exchange Server 2013</th>
<th>After completing this module, students will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troubleshooting Database Availability</td>
<td>Maintain Exchange Server 2013.</td>
</tr>
</tbody>
</table>
Installing and Configuring Windows Server 2012

Course#: MS20410

Length: 5 Days
Audience: IT Professionals
Technology: Windows Server 2012 R2
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course

Get hands-on instruction and practice installing and configuring Windows Server 2012, including Windows Server 2012 R2, in this five-day Microsoft Official Course. This course is part one in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment. The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on the initial implementation and configuration of core services, such as Networking, Storage, Active Directory Domain Services (AD DS), Group Policy, File and Print Services, and Hyper-V. This course maps directly to and is the preferred choice for hands-on preparation for the Microsoft Certified Solutions Associate (MCSA) Exam 410: Installing and Configuring Windows Server 2012, which is the first of three exams required for the MCSA: Windows Server 2012 credential. Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for information technology (IT) professionals who have some knowledge and experience working with Windows operating systems and who want to acquire the skills and knowledge necessary to install and perform the initial configuration of a Windows Server 2012 or Windows Server 2012 R2 server in an existing Windows server environment. Typically, candidates who are interested in attending this course include:

- Windows Server administrators who are relatively new to Windows Server administration and related technologies who are looking to learn more about Windows Server 2012 and Windows Server 2012 R2.
- IT professionals who are experienced in other non-Microsoft technologies, who meet the course prerequisites and are looking to cross-train on Windows Server 2012 and Windows Server 2012 R2.
- IT professionals who are looking to take the Microsoft Certified Solutions Associate (MCSA)410: Installing and Configuring Windows Server 2012 exam.
- IT professionals who want to take the Microsoft Certified Solutions Expert (MCSE) exams in Data Center, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the Microsoft Certified Solutions Associate (MCSA) exams. These are a prerequisite for their individual specialties.

At Course Completion

After completing this course, students will be able to:

- Install and configure Windows Server 2012.
- Describe AD DS.
- Manage Active Directory objects.
- Automate Active Directory administration.
- Implement IPv4.
- Implement Dynamic Host Configuration Protocol (DHCP).
• Implement Domain Name System (DNS).
• Implement IPv6.
• Implement local storage.
• Implement file and print services.
• Implement Group Policy.
• Secure Windows servers by using Group Policy Objects (GPOs).
• Implement server virtualization by using Hyper-V.

Prerequisites

This course requires that student meet the following prerequisites, including that they have:

• An understanding of networking fundamentals.
• An understanding of basic AD DS concepts.
• An awareness and understanding of security best practices.
• Basic knowledge of server hardware.
• Experience working with, and configuring, Windows client operating systems, such as Windows 7 or Windows 8.

Additionally, students would benefit from having some previous Windows Server operating system experience.

All of the above prerequisites can be met by having knowledge equivalent to, or by attending, course 10967A: Fundamentals of a Windows Server Infrastructure because this course builds upon knowledge and skills covered in that course.

Course Outline

This module introduces students to the editions of Windows Server 2012 and the new Windows Server 2012 management tools. It also covers how to install Windows Server 2012, how to perform post-deployment tasks, and how to perform basic administrative tasks.

Lessons

• Windows Server 2012 Overview
• Installing Windows Server 2012
• Post-Installation Configuration of Windows Server 2012
• Overview of Windows Server 2012 Management
• Introduction to Windows PowerShell

Lab: Deploying and Managing Windows Server 2012

• Deploying Windows Server 2012
• Configuring Windows Server 2012 Server Core
• Managing Servers
• Using Windows PowerShell to Manage Servers

After completing this module, students will be able to:

• Describe Windows Server 2012.
• Install Windows Server 2012.
• Perform post-installation configuration of Windows Server 2012.
• Describe the management tools available in Windows Server 2012.
• Perform basic administrative tasks using Windows PowerShell.

Module 2: Introduction to Active Directory Domain Services.
This module covers the structure of Active Directory Domain Services (AD DS) and its various components, such as forest, domain, and organizational units (OUs). It also gives an overview of domain controllers, in addition to choices that are available with Windows Server 2012 for installing AD DS on a server.

Lessons
• Overview of AD DS
• Overview of Domain Controllers
• Installing a Domain Controller

Lab: Installing Domain Controllers
• Installing a Domain Controller
• Installing a Domain Controller by Using IFM

After completing this module, students will be able to:
• Describe the structure of AD DS.
• Describe the purpose of domain controllers.
• Install a domain controller.

Module 3: Managing Active Directory Domain Services Objects.
This module describes how to manage user accounts and computer accounts, including how to manage various consumer devices that employees use. The module also covers how to manage an enterprise network by managing groups, and how to delegate administrative tasks to designated users or groups.

Lessons
• Managing User Accounts
• Managing Groups
• Managing Computer Accounts
• Delegating Administration

Lab: Managing Active Directory Domain Services Objects
• Delegating Administration for a Branch Office
• Creating and Configuring User Accounts in AD DS
• Managing Computer Objects in AD DS

After completing this module, students will be able to:
• Manage user accounts with graphical tools.
• Manage group accounts with graphical tools.
• Manage computer accounts.
• Delegate permissions to perform AD DS administration.

Module 4: Automating Active Directory Domain Services Administration.
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons
• Using Command-line Tools for AD DS Administration
• Using Windows PowerShell for AD DS Administration
• Performing Bulk Operations with Windows PowerShell

Lab: Automating AD DS Administration by Using Windows PowerShell
• Creating User Accounts and Groups by Using Windows PowerShell
• Using Windows PowerShell to Create User Accounts in Bulk
• Using Windows PowerShell to Modify User Accounts in Bulk
After completing this module, students will be able to:

- Use command-line tools for AD DS administration.
- Use Windows PowerShell cmdlets for AD DS administration.
- Perform bulk operations by using Windows PowerShell.

Module 5: Implementing IPv4
This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks.
In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

Lab: Implementing IPv4

- Identifying Appropriate Subnets
- Troubleshooting IPv4

After completing this module, students will be able to:

- Describe the TCP/IP protocol suite.
- Describe IPv4 addressing.
- Determine a subnet mask necessary for supernetting or subnetting.
- Configure IPv4 and troubleshoot IPv4 communication.

This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Lab: Implementing DHCP

- Implementing DHCP
- Implementing a DHCP Relay Agent (Optional Exercise)

After completing this module, students will be able to:

- Explain the DHCP server role.
- Configure DHCP scopes.
- Manage a DHCP database.
- Secure and monitor the DHCP server role.

Module 7: Implementing DNS. This module describes name resolution for Windows operating system clients and Windows Server servers.
It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Lab: Implementing DNS

- Installing and Configuring DNS
- Creating Host Records in DNS
- Managing the DNS Server Cache
After completing this module, students will be able to:

- Describe name resolution for Windows operating system clients and Windows Server servers.
- Install and manage a DNS Server.
- Manage DNS zones.

Module 8: Implementing IPv6
This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Lab: Implementing IPv6

- Configuring an IPv6 Network
- Configuring an ISATAP Router

After completing this module, students will be able to:

- Describe the features and benefits of IPv6.
- Describe IPv6 addressing.
- Describe IPv6 coexistence with IPv4.
- Describe IPv6 transition technologies.

Module 9: Implementing Local Storage
This module introduces several different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Lab: Implementing Local Storage

- Installing and Configuring a New Disk
- Resizing Volumes
- Configuring a Redundant Storage Space

After completing this module, students will be able to:

- Describe various storage technologies.
- Explain how to manage disks and volumes.
- Explain how to implement Storage Spaces.

Module 10: Implementing File and Print Services
This module discusses how to provide file and print resources with Windows Server 2012. It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.

Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

Lab: Implementing File and Print Services

- Creating and Configuring a File Share
- Configuring Shadow Copies
- Enabling and Configuring Work Folders
- Creating and Configuring a Printer Pool

After completing this module, students will be able to:
• Secure shared files and folders.
• Protect shared files and folders by using shadow copies.
• Configure the Work Folders role service.
• Configure network printing.

Module 11: Implementing Group Policy. This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

• Overview of Group Policy
• Group Policy Processing
• Implementing a Central Store for Administrative Templates

Lab: Implementing Group Policy

• Configuring a central store
• Creating GPOs

After completing this module, students will be able to:

• Create and manage Group Policy Objects (GPOs).
• Describe Group Policy processing.
• Implement a Central Store for Administrative Templates.

This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

• Security Overview for Windows Operating Systems
• Configuring Security Settings
• Restricting Software

• Configuring Windows Firewall with Advanced Security

Lab: Increasing Security for Server Resources

• Using Group Policy to Secure Member Servers
• Auditing File System Access
• Auditing Domain Logons

Lab: Configuring AppLocker and Windows Firewall

• Configuring AppLocker Policies
• Configuring Windows Firewall

After completing this module, students will be able to:

• Describe Windows Server operating system security.
• Configure security settings by using Group Policy.
• Increase security for server resources.
• Restrict unauthorized software from running on servers and clients.
• Configure Windows Firewall with Advanced Security.

Module 13: Implementing Server Virtualization with Hyper-V.
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

• Overview of Virtualization Technologies
• Implementing Hyper-V
• Managing Virtual Machine Storage
• Managing Virtual Networks
Lab: Implementing Server Virtualization with Hyper-V

- Installing the Hyper-V Role onto a Server
- Configuring Virtual Networking
- Creating and Configuring a Virtual Machine
- Using Virtual Machine Checkpoints

After completing this module, students will be able to:

- Describe virtualization technologies.
- Implement Hyper-V.
- Manage virtual machine storage.
- Manage virtual networks.
About this Course

Get hands-on instruction and practice administering Windows Server 2012, including Windows Server 2012 R2, in this five-day Microsoft Official Course. This course is part two in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment. The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on the administration tasks necessary to maintain a Windows Server 2012 infrastructure such as configuring and troubleshooting name resolution, user and group management with Active Directory Domain Services (AD DS) and Group Policy, implementing Remote Access solutions such as Direct Access, VPNs and Web Application Proxy, implementing Network Policies and Network Access Protection, Data Security, deployment and maintenance of server images, as well as update management and monitoring of Windows Server 2012 environments. This course maps directly to and is the preferred choice for hands-on preparation for Microsoft Certified Solutions Associate (MCSA): Exam 411: Administering Windows Server 2012, which is the second of three exams required for MCSA: Windows Server 2012 credential. Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment. The key focus for students is to broaden the initial deployment of Windows Server 2012 services and infrastructure and provide the skills necessary to manage and maintain a domain based Windows Server 2012 environment, providing skills in areas such as User and Group management, Network Access and Data Security. Candidates typically interested in attending this course would be:


- IT Professionals who are looking to take the 411, Administering Windows Server 2012 exam
- IT professional wishing to take the Microsoft Certified Solutions Expert (MCSE) exams in Data Center, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the Microsoft Certified Solutions Associate (MCSA) exams, which are a pre-requisite for their individual specialties.
After completing this course, students will be able to:

- Configure and Troubleshoot Domain Name System
- Maintain Active Directory Domain Services
- Manage User and Service Accounts
- Implement Group Policy Infrastructure
- Manage User Desktops using Group Policy
- Install, Configure and Troubleshoot Network Policy Server
- Implement Network Access Protection
- Implement Remote Access
- Optimize File Services
- Configure Encryption and Advanced Auditing
- Deploy and Maintain Server Images
- Implement Update Managements
- Monitor Windows Server 2012

Before attending this course, students must have:

- Knowledge and skills concerning the initial implementation and configuration of core Windows Server services including Active Directory Domain Services (AD DS), Networking Services and Microsoft Hyper-V.

The course pre-requisites can be met by having knowledge equivalent to, or by attendance at, course 20410D: Installing and Configuring Windows Server 2012, as this course will build upon that knowledge and skills covered in that course.

### Course Outline

**Module 1: Configuring and Troubleshooting Domain Name System**

This module explains how to configure and troubleshoot DNS, including DNS replication and caching.

**Lessons**

- Lessons
Module 1: Configuring the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Lab: Configuring and Troubleshooting DNS
- Configuring DNS Resource Records
- Configuring DNS Conditional Forwarding
- Installing and Configuring DNS Zones
- Troubleshooting DNS

After completing this module, students will be able to:
- Install and configure the DNS server role.
- Create and configure DNS zones.
- Configure DNS zone transfers.
- Manage and troubleshoot DNS.

Module 2: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons
- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODCs
- Administering AD DS
- Managing the AD DS Database

Lab: Maintaining AD DS
- Installing and Configuring a RODC
- Configuring AD DS Snapshots
- Configuring the Active Directory Recycle Bin

Module 3: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts.
It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons
- Configuring Password Policy and User Account Lockout Settings
- Configuring Managed Service Accounts

Lab: Managing User and Service Accounts
- Configuring Password Policy and Account Lockout Settings
- Creating and Associating a Managed Service Account

After completing this module, students will be able to:
- Configure password policy and user account lockout settings.
- Configure managed service accounts.

Module 4: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform
common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

- Introducing Group Policy
- Implementing and Administering GPOs
- Group Policy Scope and Group Policy Processing
- Troubleshooting the Application of GPOs

Lab : Implementing a Group Policy Infrastructure

- Creating and Configuring Group Policy Objects
- Managing GPO Scope
- Verify GPO Application
- Managing GPOs

After completing this module, students will be able to:

- Explain what Group Policy is.
- Implement and administer Group Policy Objects (GPOs).
- Manage Group Policy scope and Group Policy processing.
- Troubleshoot the application of GPOs.

Module 5: Managing User Desktops with Group Policy

This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Lab : Managing User Desktops with Group Policy

- Implement Settings by Using Group Policy Preferences
- Managing Office 2013 by using Administrative Templates
- Deploying Software by using Group Policy
- Configuring Folder Redirection

After completing this module, students will be able to:

- Configure folder redirection and scripts by using GPOs.
- Describe and implement Administrative Templates.
- Configure GPO preferences.
- Deploy software by using GPOs.

Module 6: Installing, Configuring, and Troubleshooting the Network Policy Server Role

This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describe NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons

- Installing and Configuring a Network Policy Server
- Configuring RADIUS Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a Network Policy Server

Lab : Installing and Configuring a Network Policy Server

- Installing and Configuring NPS to Support
RADIUS
  • Configuring and Testing a RADIUS Client

After completing this module, students will be able to:
  • Install and configure a Network Policy Server (NPS).
  • Configure clients and servers with the Remote Authentication Dial-In User Service (RADIUS) protocol.
  • Explain NPS authentication methods.
  • Monitor and troubleshoot NPS.

Module 7: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons
  • Overview of Network Access Protection
  • Overview of NAP Enforcement Processes
  • Configuring NAP
  • Configuring IPSec Enforcement for NAP
  • Monitoring and Troubleshooting NAP

Lab : Implementing Network Access Protection
  • Configuring NAP Components
  • Configuring Virtual Private Network Access
  • Configuring the Client Settings to Support NAP

After completing this module, students will be able to:
  • Describe how NAP can help to protect your network.
  • Describe the various NAP enforcement processes.
  • Configure NAP.
  • Monitor and troubleshoot NAP.

Module 8: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons
  • Overview of Remote Access
  • Implementing DirectAccess by Using the Getting Started Wizard
  • Implementing and Managing an Advanced DirectAccess Infrastructure
  • Implementing VPN
  • Implementing Web Application Proxy

Lab : Implementing DirectAccess by Using the Getting Started Wizard
  • Verifying Readiness for a DirectAccess Deployment
  • Configuring DirectAccess
  • Validating the DirectAccess Deployment

Lab : Deploying an Advanced DirectAccess Solution
  • Preparing the Environment for DirectAccess
  • Implementing the Advanced DirectAccess Infrastructure
  • Validating the DirectAccess Deployment

Lab : Implementing VPN
  • Implementing VPN
  • Validating the VPN Deployment

Lab : Implementing Web Application Proxy
  • Implementing Web Application Proxy
  • Validating the Web Application Proxy
Deployment

After completing this module, students will be able to:

- Install and manage the Remote Access role in Windows Server 2012 operating system.
- Implement DirectAccess by using the Getting Started Wizard.
- Implement and manage an advanced DirectAccess Infrastructure.
- Implement VPN access.
- Implement Web Application Proxy.

Module 9: Optimizing File Services

This module describes FSRM, configure quotas, file screening and storage reports and implement classification management and file management tasks. It describes the components of the DFS. I also explain how to configure DFS namespaces and DFS replication.

Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of DFS
- Configuring DFS Namespaces
- Configuring and Troubleshooting DFS Replication

Lab: Configuring Quotas and File Screening Using File Server Resource Manager

- Configuring File Server Resource Manager Quotas
- Configuring File Screening and Storage Reports

Lab: Implementing Distributed File System

- Installing the DFS role service

- Configuring a DFS Namespace
- Configuring DFS Replication

After completing this module, students will be able to:

- Describe the File Server Resource Manager (FSRM) in the Windows Server 2012 operating system.
- Use FSRM to manage quotas, file screens, and storage reports.
- Implement classification and file management tasks.
- Describe Distributed File System (DFS).
- Configure DFS namespaces.
- Configure and troubleshoot DFS Replication.

Module 10: Configuring Encryption and Advanced Auditing

This module explains how to encrypt files using EFS and configure advanced auditing features.

Lessons

- Encrypting Drives by Using BitLocker
- Encrypting Files by Using EFS
- Configuring Advanced Auditing

Lab: Configuring Encryption and Advanced Auditing

- Using Windows BitLocker Drive Encryption to Secure Data Drives
- Encrypting and Recovering Files
- Configuring Advanced Auditing

After completing this module, students will be able to:

- Secure data by using BitLocker Drive Encryption.
- Encrypt files by using Encrypting File System (EFS).
- Configure advanced auditing.
Module 11: Deploying and Maintaining Server Images
This module explains how to create and manage server images by using Windows Deployment Services.

Lessons
- Overview of Windows Deployment Services
- Managing Images
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services

Lab: Using Windows Deployment Services to Deploy Windows Server 2012
- Installing and Configuring Windows Deployment Services
- Creating Operating System Images with Windows Deployment Services
- Configuring Custom Computer Naming
- Deploying Images with Windows Deployment Services

After completing this module, students will be able to:

- Describe the important features and functionality of Windows Deployment Services (Windows DS).
- Manage images by using Windows Assessment and Deployment Kit (Windows ADK) Tools.
- Perform deployments with Windows Deployment Services.

Module 12: Implementing Update Management
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

Lessons
- Overview of WSUS
- Deploying Updates with WSUS

Lab: Implementing Update Management
- Implementing the WSUS Server Role
- Configuring Update Settings
- Approving and Deploying an Update by using WSUS

After completing this module, students will be able to:

- Describe the role of WSUS.
- Describe the WSUS update management process.
- Deploy updates with WSUS.

Module 13: Monitoring Windows Server 2012
This module explains the monitoring tools available in Windows Server 2012. It also explains how to use Performance Monitor and monitor events.

Lessons
- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

Lab: Monitoring Windows Server 2012
- Establishing a Performance Baseline
- Identifying the Source of a Performance Problem
- Viewing and Configuring Centralized Event Logs

After completing this module, students will be able to:

- Describe the monitoring tools for the
Windows Server 2012 operating system.

- Use Performance Monitor to view and analyze performance statistics of programs that are running on their servers.
- Monitor event logs to view and interpret the recorded events.
Configuring Advanced Windows Server 2012 Services

Course 20412D

About this Course

Get hands-on instruction and practice configuring advanced Windows Server 2012, including Windows Server 2012 R2, services in this five-day Microsoft Official Course. This course is part three in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment.

The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on advanced configuration of services necessary to deploy, manage and maintain a Windows Server 2012 infrastructure, such as advanced networking services, Active Directory Domain Services (AD DS), Active Directory Rights Management Services (AD RMS), Active Directory Federation Services (AD FS), Network Load Balancing, Failover Clustering, business continuity and disaster recovery services as well as access and information provisioning and protection technologies such as Dynamic Access Control (DAC), and Web Application Proxy integration with AD FS and Workplace Join.

This course maps directly to and is the preferred choice for hands-on preparation for Microsoft Certified Solutions Associate (MCSA): Exam 412: Configuring Advanced Windows Server 2012 Services, which is the third of three exams required for MCSA: Windows Server 2012 credential.

Note: Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for Information Technology (IT) Professionals with hands on experience implementing, managing and maintaining a Windows Server 2012 or Windows Server 2012 R2 environment who wish to acquire the skills and knowledge necessary to perform advanced management and provisioning of services within that Windows Server 2012 environment. Candidates who would typically be interested in attending this course will be:

- Experienced Windows Server Administrators who have real world experience working in a Windows Server 2008 or Windows Server 2012 enterprise environment.
- IT Professionals who are looking to take the exam 412: Configuring Advanced Windows Server 2012 Services.
- IT Professionals wishing to take the Microsoft Certified Solutions Expert (MCSE) exams in Datacenter, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the MCSA exams, which are a pre-requisite for their individual specialties.
At Course Completion

After completing this course, students will be able to:

• Configure advanced features for Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), and configure IP Address Management (IPAM) with Windows Server 2012.
• Configure and manage iSCSI, BranchCache and FSRM.
• Configure DAC to manage and audit access to shared files.
• Plan and implement an AD DS deployment that includes multiple domains and forests.
• Plan and implement an AD DS deployment that includes locations.
• Implement and configure an Active Directory Certificate Services (AD CS) deployment.
• Implement an AD RMS deployment.
• Implement an AD FS deployment.
• Provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).
• Implement and validate high availability and load balancing for web-based applications by implementing NLB.
• Provide high availability for network services and applications by implementing failover clustering.
• Implement a failover cluster, and configure and validate a highly available network service.
• Deploy and manage Hyper-V virtual machines in a failover cluster.
• Implement a backup and disaster recovery solution based on business and technical requirements.

Prerequisites

Before attending this course, students must have:

• Experience working with Windows Server 2008 or Windows Server 2012 servers day to day in an Enterprise environment.

The course pre-requisites can be met by having knowledge equivalent to, or by attendance at, courses 20410C: Installing and Configuring Windows Server 2012 and 20411C: Administering Windows Server 2012 as this course will build upon the knowledge and skills covered in those courses.

Course Outline

Module 1: Implementing Advanced Network Services
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

• Configuring Advanced DHCP Features
20412D: Configuring Advanced Windows Server 2012 Services

COURSE OUTLINE

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- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

Lab : Implementing Advanced Network Services

- Configuring Advanced DHCP Settings
- Configuring Advanced DNS Settings
- Configuring IPAM

After completing this module, students will be able to:

- Configure advanced features in DHCP with Windows Server 2012.
- Configure the advanced DNS settings in Windows Server 2012.
- Implement IP Address Management in Windows Server 2012.

Module 2: Implementing Advanced File Services
In this module students will be able to configure file services to meet advanced business requirements.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Lab : Implementing Advanced File Services

- Configuring iSCSI Storage
- Configuring the File Classification Infrastructure

Lab : Implementing BranchCache

- Configuring the Main Office Servers for BranchCache
- Configuring the Branch Office Servers for BranchCache
- Configuring Client Computers for BranchCache

- Monitoring BranchCache

After completing this module, students will be able to:

- Learn how to configure and manage iSCSI.
- Implement Windows Server 2012 features that optimize storage utilization.

Module 3: Implementing Dynamic Access Control
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

Lab : Implementing Secure Data Access

- Preparing for DAC deployment
- Implementing DAC
- Validating and Remediating DAC
- Implementing Work Folders

After completing this module, students will be able to:

- Describe DAC.
- Implement and configure components of DAC.
- Implement DAC on file servers.
- Describe and implement access-denied assistance.
- Implement the integration of Work Folders with DAC.
Module 4: Implementing Distributed Active Directory Domain Services Deployments
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Lab: Implementing Distributed AD DS Deployments

- Implementing Child Domains in AD DS
- Implementing Forest Trusts

After completing this module, students will be able to:

- Describe the components of a highly complex AD DS deployment.
- Implement a complex AD DS deployment.
- Configure AD DS trusts.

Module 5: Implementing Active Directory Domain Services Sites and Replication
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons

- AD DS Replication Overview
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Lab: Implementing AD DS Sites and Replication

- Modifying the Default Site

Module 6: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons

- Using Certificates in a Business Environment
- PKI Overview
- Deploying CAs
- Deploying and Managing Certificate Templates
- Implementing Certificate Distribution and Revocation
- Managing Certificate Recovery

Lab: Deploying and Configuring CA Hierarchy

- Deploying a Stand-Alone Root CA
- Deploying an Enterprise Subordinate CA

Lab: Deploying and Managing Certificates

- Configuring Certificate Templates
- Configuring Certificate Enrollment
- Configuring Certificate Revocation
- Configuring Key Recovery

After completing this module, students will be able to:

- Describe how replication works in a Windows Server 2012 AD DS environment.
- Configure AD DS sites in order to optimize AD DS network traffic.
- Configure and monitor AD DS replication.
• Describe and use certificates in business environments.
• Describe the Public Key Infrastructure (PKI) components and concepts, and describe the options for implementing a certification authority infrastructure.
• Plan and implement an AD CS certification authority infrastructure.
• Plan and implement a certificate template deployment using an AD CS certification authority.
• Plan and implement certificate distribution and revocation.
• Configure and manage key archival and recovery.

Module 7: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons
• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Lab : Implementing AD RMS
• Installing and Configuring AD RMS
• Configuring AD RMS Templates
• Implementing the AD RMS Trust Policies
• Verifying AD RMS on a Client

After completing this module, students will be able to:
• Describe what AD RMS is, and how it can be used to achieve content protection.
• Deploy and manage an AD RMS infrastructure.

Module 8: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons
• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Lab : Implementing AD FS
• Installing and Configuring AD FS
• Configuring an Internal Application for AD FS

Lab : Implementing AD FS for External Partners and Users
• Configuring AD FS for a Federated Business Partner
• Configuring Web Application Proxy

After completing this module, students will be able to:
• Describe the identity federation business scenarios and how AD FS can be used to address the scenarios.
• Configure the AD FS prerequisites and deploy the AD FS services.
• Implement AD FS to enable SSO in a single organization.
• Implement AD FS to enable SSO between federated partners.
• Implement the Web Application Proxy and describe WorkPlace Join integration with AD FS.

Module 9: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Lab: Implementing NLB

• Implementing an NLB Cluster
• Configuring and Managing the NLB Cluster
• Validating High Availability for the NLB Cluster

After completing this module, students will be able to:

• Describe how NLB works.
• Configure an NLB cluster.
• Plan an NLB implementation.

Module 10: Implementing Failover Clustering
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster

Lab: Implementing Failover Clustering

• Configuring a Failover Cluster
• Deploying and Configuring a Highly Available File Server
• Validating the Deployment of the Highly Available File Server
• Configuring CAU on the Failover Cluster

After completing this module, students will be able to:

• Explain failover clustering features in Windows Server 2012.
• Describe how to implement a failover cluster.
• Explain how to configure highly available applications and services on a failover cluster.
• Explain how to maintain a failover cluster and how to use new maintenance features.
• Describe how to implement multi-site failover cluster.

Module 11: Implementing Failover Clustering with Hyper-V
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement

Lab: Implementing Failover Clustering with Hyper-V

• Configuring Hyper-V Replicas
• Configuring a Failover Cluster for Hyper-V
• Configuring a Highly Available Virtual Machine

After completing this module, students will be able to:

• Explain options for making virtual machines highly available.
• Describe how to implement virtual machines in a failover cluster deployed on a host.
• Explain options for moving a virtual machine or its storage.
• Explain a high level overview of Microsoft System Center 2012- Virtual Machine Manager (VMM) 2012.

Module 12: Implementing Business Continuity and Disaster Recovery

In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements

Lessons

• Data Protection Overview
• Implementing Windows Server Backup
• Implementing Server and Data Recovery

Lab : Implementing Windows Server Backup and Restore

• Backing Up Data on a Windows Server 2012 R2 Server
• Restoring Files Using Windows Server Backup

After completing this module, students will be able to:

• Describe the considerations that must be included when you are implementing a disaster recovery solution.
• Plan and implement a backup solution for Windows Server 2012.
Implementing Data Models & Reports with Microsoft SQL Server
Course#: MS20466

Length: 5 Days
Audience: BI Developers
Technology: Microsoft SQL Server
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course
The focus of this five-day instructor-led course is on creating managed enterprise BI solutions. It describes how to implement multidimensional and tabular data models, deliver reports with Microsoft SQL Server Reporting Services, create dashboards with Microsoft SharePoint Server PerformancePoint Services, and discover business insights by using data mining.

Audience Profile
This course is intended for database professionals who need to fulfill a Business Intelligence Developer role to create analysis and reporting solutions. Primary responsibilities include:

- Implementing analytical data models, such as OLAP cubes.
- Implementing reports, and managing report delivery.
- Creating business performance dashboards.
- Supporting data mining and predictive analysis.

At Course Completion
After completing this course, students will be able to:

- Describe the components, architecture, and nature of a BI solution.
- Create a multidimensional database with Analysis Services.
- Implement dimensions in a cube.
- Implement measures and measure groups in a cube.
- Use MDX Syntax.
- Customize a cube.
- Implement a Tabular Data Model in SQL Server Analysis Services.
- Use DAX to enhance a tabular model.
- Create reports with Reporting Services.
- Enhance reports with charts and parameters.
- Manage report execution and delivery.
- Implement a dashboard in SharePoint Server with PerformancePoint Services.
- Use Data Mining for Predictive Analysis.

Prerequisites
This course requires that you meet the following prerequisites:

- At least 2 years’ experience of working with relational databases, including:
- Designing a normalized database.
Course Outline

Module 1: Introduction to Business Intelligence and Data Modeling
As a SQL Server database professional, you may be required to participate in, or perhaps even lead, a project with the aim of implementing an effective enterprise BI solution. Therefore, it is important that you have a good understanding of the various elements that comprise a BI solution, the business and IT personnel typically involved in a BI project, and the Microsoft products that you can use to implement the solution.

Lessons
- Elements of an Enterprise BI Solution
- The Microsoft Enterprise BI Platform
- Planning an Enterprise BI Project

Lab: Exploring a BI Solution
- Exploring the Data Warehouse
- Exploring the Analysis Services Data Model
- Exploring Reports

After completing this module, you will be able to:
- Describe the elements of a typical BI solution.
- Select appropriate Microsoft technologies for a BI solution.
- Describe key considerations for planning a BI project.

Module 2: Creating Multidimensional Databases
This module provides an introduction to multidimensional databases and introduces the core components of an Online Analytical Processing (OLAP) cube.

Lessons
- Introduction to Multidimensional Analysis
- Creating Data Sources and Data Source Views
- Creating a Cube
- Overview of Cube Security

Lab: Creating a Multidimensional Database
- Creating a Data Source
- Creating and Modifying a Data Source View
- Creating and Modifying a Cube
- Adding a Dimension

After completing this module, you will be able to:
- Describe the considerations for a multidimensional database
- Create data sources and data source views
- Create a cube
- Implement security in a multidimensional database

Module 3: Working with Cubes and Dimensions
This module describes how to create and configure dimensions and dimension hierarchies in an Analysis Services multidimensional data model.

Lessons
- Configuring Dimensions
- Defining Attribute Hierarchies
- Sorting and Grouping Hierarchies

Lab: Defining Dimensions
- Configuring Dimensions and Attributes
- Creating Hierarchies
Module 4: Working with Measures and Measure Groups

This module describes measures and measure groups. It also explains how you can use them to define fact tables and associate dimensions with measures.

Lessons
- Working with Measures
- Working with Measure Groups

Lab: Configuring Measures and Measure Groups
- Configuring Measures
- Defining a Regular Relationship
- Configuring Measure Group Storage

After completing this module, you will be able to:
- Configure measures
- Configure measure groups

Module 5: Introduction to MDX

This module describes the fundamentals of MDX and explains how to build calculations, such as calculated members and named sets.

Lessons
- MDX Fundamentals
- Adding Calculations to a Cube
- Using MDX to Query a Cube

Lab: Using MDX
- Creating Calculated Members

Module 6: Enhancing a Cube

This module describes how to enhance a cube with Key Performance Indicators (KPIs), actions, perspectives, and translations.

Lessons
- Working with Key Performance Indicators
- Working with Actions
- Working with Perspectives
- Working with Translations

Lab: Customizing a Cube
- Implementing an Action
- Implementing Perspectives
- Implementing a Translation

After completing this module, you will be able to:
- Implement Key Performance Indicators
- Implement Actions
- Implement Perspectives
- Implement Translations

Module 7: Implementing an Analysis Services Tabular Data Model

This module describes Analysis Services tabular data models and explains how to develop a tabular data model using the SQL Server Data Tools for Business Intelligence (BI) add-in for Visual Studio.

Lessons
- Introduction to Analysis Services Tabular Data Models
- Creating a Tabular Data Model
- Using an Analysis Services Tabular Data Model in the Enterprise
Lab: Implementing an Analysis Services Tabular Data Model

- Creating an Analysis Services Tabular Data Model Project
- Configuring Columns and Relationships
- Deploying an Analysis Services Tabular Data Model

After completing this module, you will be able to:

- Describe Analysis Services tabular data model projects
- Implement an Analysis Services tabular data model
- Use an Analysis Services tabular data model

Module 8: Introduction to DAX
This module explains the fundamentals of the DAX language. It also explains how you can use DAX to create calculated columns and measures, and how you can use them in your tabular data models.

Lessons

- DAX Fundamentals
- Enhancing a Tabular Data Model with DAX

Lab: Using DAX to Enhance a Tabular Data Model

- Creating Calculated Columns
- Creating Measures
- Creating a KPI
- Implementing a Parent-Child Hierarchy

After completing this module, you will be able to:

- Describe the fundamentals of DAX
- Use DAX to create calculated columns and measures

Module 9: Implementing Reports with SQL Server Reporting Services
This module introduces Microsoft SQL Server Reporting Services and discusses the tools and techniques that a professional BI developer can use to create and publish reports.

Lessons

- Introduction to Reporting Services
- Creating a Report with Report Designer
- Grouping and Aggregating Data in a Report
- Publishing and Viewing a Report

Lab: Creating a Report with Report Designer

- Creating a Report
- Grouping and Aggregating Data
- Publishing a Report

After completing this module, you will be able to:

- Describe the key features of Reporting Services
- Use Report Designer to create a report
- Group and aggregate data in a report
- Publish and view a report

Module 10: Enhancing Reports with SQL Server Reporting Services
This module describes how to enhance a SQL Server reporting Services report with charts and other visualizations, and how to use parameters to filter data in a report.

Lessons

- Showing Data Graphically
- Filtering Reports by Using Parameters

Lab: Enhancing a Report

- Adding a Chart to a Report
- Adding Parameters to a Report
- Using Data Bars and Sparklines
- Using a Map

After completing this module, you will be able to:

- Use charts and other visualizations to show data graphically in a report
- Use parameters to filter data in a report
Module 11: Managing Report Execution and Delivery
This module describes how to apply security and report execution settings, and how to create subscriptions to deliver reports.

Lessons
- Managing Report Security
- Managing Report Execution
- Subscriptions and Data Alerts
- Troubleshooting Reporting Services

Lab: Configuring Report Execution and Delivery
- Configuring Report Execution
- Implementing a Standard Subscription
- Implementing a Data-Driven Subscription

After completing this module, you will be able to:
- Configure security settings for a report server.
- Configure report execution settings to optimize performance.
- Use subscriptions and alerts to automate report and data delivery.
- Troubleshoot reporting issues

Module 12: Delivering BI with SharePoint PerformancePoint Services
This module introduces Microsoft SharePoint Server as a platform for BI, and then focuses on building BI dashboards and scorecards with PerformancePoint Services.

Lessons
- Introduction to SharePoint Server as a BI Platform
- Introduction to PerformancePoint Services
- PerformancePoint Data Sources and Time Intelligence
- Reports, Scorecards, and Dashboards

Lab: Implementing a SharePoint Server BI Solution
- Creating a SharePoint Server Site for BI
- Configuring PerformancePoint Data Access
- Creating PerformancePoint Reports
- Creating a PerformancePoint Scorecard
- Creating a PerformancePoint Dashboard

After completing this module, you will be able to:
- Describe SharePoint Server as a BI platform
- Use PerformancePoint Services to deliver BI functionality
- Configure PerformancePoint Data Sources
- Create Reports, Scorecards, and Dashboards

Module 13: Performing Predictive Analysis with Data Mining
This module introduces data mining, describes how to create a data mining solution, how to validate data mining models, how to use the Data Mining Add-ins for Microsoft Excel, and how to incorporate data mining results into Reporting Services reports.

Lessons
- Overview of Data Mining
- Creating a Data Mining Solution
- Validating a Data Mining Model
- Consuming Data Mining Data

Lab: Using Data Mining to Support a Marketing Campaign
- Using Table Analysis Tools
- Creating a Data Mining Structure
- Adding a Data Mining Model to a Data Mining Structure
- Validating a Data Mining Model
- Using a Data Mining Model in a Report

After completing this module, you will be able to:
- Describe the key data mining concepts and use the Data Mining Add-ins for Excel
- Create a data mining solution
- Validate data mining models
- Use data mining data in a report
About this Course

This five-day instructor-led course teaches students how to implement self-service Business Intelligence (BI) and Big Data analysis solutions using the Microsoft data platform. The course discusses the rationale for self-service BI, and describes how to use Microsoft SQL Server Reporting Services, Microsoft Excel, Microsoft SharePoint Server, and Microsoft Office 365 Power BI to create self-service data models and reports. The course then goes on to describe how to use Windows Azure HDInsight to perform Big Data analysis.

Audience Profile

The primary audience for this course is database and business intelligence (BI) professionals who are familiar with data warehouses and enterprise BI solutions built with SQL Server technologies. Experienced data analysts who want to learn how to use Microsoft technologies for self-service analysis and reporting will also benefit from attending this course.

At Course Completion

After completing this course, students will be able to:

- Describe key features and benefits of self-service BI.
- Use SQL Server Reporting Services to implement a self-service reporting solution.
- Use PowerPivot in Microsoft Excel to create analytical data models.
- Use Power Query in Microsoft Excel to import data into a data model.
- Use Power View in Microsoft Excel to create interactive data visualizations.
- Use Power Map in Microsoft Excel to create geographic data visualizations.
- Use Microsoft SharePoint Server to implement collaborative self-service BI solutions.
- Find and use public data in the Windows Azure Marketplace.
- Use Microsoft Office 365 Power BI to implement cloud-based self-service BI solutions.
- Provision and use a Windows Azure HDInsight cluster for Big Data analysis.
- Use Pig and Hive to analyze big data in Windows Azure HDInsight.
- Design and implement Big Data processes to support self-service BI.

Prerequisites

This course requires that you meet the following prerequisites:

- Knowledge of data warehousing and data modeling principles.
- Familiarity with Microsoft Excel and Microsoft SharePoint Server 2013.
Module 1: Introduction to Self-Service Business Intelligence
This module introduces self-service BI.

Lessons
- Extending Enterprise BI
- Microsoft Self-Service BI and Big Data Technologies

Lab: Exploring an Enterprise BI Solution
- Viewing Reports
- Analyzing Data in a Data Model
- Analyzing Data from Multiple Sources

After completing this module, you will be able to:
- Describe ways in which an enterprise BI solution can be extended.
- Identify Microsoft technologies for self-service BI and Big Data analysis.

Module 2: Self-Service Reporting
This module describes how to use Report Builder as a tool for self-service Microsoft SQL Server Reporting Services report authoring.

Lessons
- Introduction to Self-Service Reporting
- Shared Data Sources and Datasets
- Report Parts

Lab: Implementing Self-Service Reporting
- Using Report Builder
- Simplifying Data Access for Business Users
- Using Report Parts

After completing this module, you will be able to:

Module 3: Self-Service Data Modeling with PowerPivot
This module describes how to use PowerPivot in Microsoft Excel to create self-service data models for analysis.

Lessons
- Creating Data Models in Excel with PowerPivot
- Using DAX in a PowerPivot Data Model

Lab: Self-Service Data Modeling with PowerPivot
- Creating a Data Model with PowerPivot
- Enhancing a Data Model
- Extending a Data Model

After completing this module, you will be able to:
- Use PowerPivot to create tabular data models in Excel.
- Enhance data models with custom DAX expressions.

Module 4: Importing Data with Power Query
This lesson describes how to use Power Query in Microsoft Excel to find and import data.

Lessons
- Introduction to Power Query
- Using Power Query to Import Data

Lab: Using Power Query
- Importing data with Power Query
- Merging Queries
- Adding a Query to a Data Model

After completing this module, you will be able to:
• Enable Power Query and use it to search for data online
• Use Power Query to import data from multiple data sources into an Excel data model

Module 5: Visualizing Data with Power View in Microsoft Excel
This module describes how to use Power View in Microsoft Excel to create interactive data visualizations.

Lessons
• Introduction to Power View
• Creating Dynamic Data Visualizations

Lab: Visualizing Data with Power View
• Using Power View

After completing this module, you will be able to:
• Describe the features of Power View
• Use Power View to create interactive data visualizations in Excel

Module 6: Visualizing Geographic Data with Power Map
This module describes how to use Power Map in Microsoft Excel to create geographic data visualizations.

Lessons
• Introduction to Power Map
• Using Power Map

Lab: Visualizing Geographic Data with Power Map
• Creating a Power Map Tour
• Visualizing Data Over Time

After completing this module, you will be able to:
• Describe the features and usage scenarios of Power Map

Module 7: Collaborative BI with Microsoft SharePoint Server
This module describes how to use Microsoft SharePoint Server in an enterprise environment to enable users to share PowerPivot workbooks and Power View reports.

Lessons
• Sharing PowerPivot Workbooks
• Managing PowerPivot Services in SharePoint Server
• Using Power View in SharePoint Server

Lab: Using SharePoint Server for BI Collaboration
• Sharing a PowerPivot Workbook
• Managing PowerPivot Data Refresh
• Using Power View in SharePoint Server

After completing this module, you will be able to:
• Share a PowerPivot workbook in SharePoint Server
• Manage PowerPivot services in SharePoint Server
• Use Power View to create interactive data visualizations in SharePoint Server

Module 8: The Windows Azure Marketplace Data Market
This module describes how to find and use datasets in the Windows Azure Marketplace.

Lessons
• Introduction to the Windows Azure Marketplace
• Using Windows Azure Marketplace Data in Microsoft Excel

Lab: Using the Windows Azure Marketplace
MODULE 9: CLOUD COLLABORATION WITH POWER BI FOR MICROSOFT OFFICE 365
This module introduces Power BI for Microsoft Office 365, and describes how to use it for cloud-based, collaborative self-service BI.

Lesson
- Introduction to Power BI
- Natural Language Queries with Q&A
- Sharing Queries
- The Data Management Gateway

Lab: Using Power BI
- Provisioning Power BI
- Viewing Reports and Querying Data in Power BI
- Sharing Queries
- Cloud-Enabling a Data Source

After completing this module, you will be able to:
- Find data in the Windows Azure Marketplace
- Import Windows Azure Marketplace data into Microsoft Excel

MODULE 10: INTRODUCTION TO BIG DATA AND WINDOWS AZURE HDINSIGHT
This module introduces Big Data concepts and describes the key features of Windows Azure HDInsight.

Lesson
- Introduction to Big Data
- Windows Azure HDInsight

Lab: Using Windows Azure HDInsight
- Provisioning a Windows Azure HDInsight Cluster
- Processing Data with HDInsight
- Analyzing Big Data in Microsoft Excel

After completing this module, you will be able to:
- Describe key features of Big Data.
- Use Windows Azure HDInsight to process Map/Reduce jobs

MODULE 11: PROCESSING BIG DATA WITH PIG AND HIVE
This module introduces Pig and Hive, and describes how you can use them to process Big Data in Windows Azure HDInsight.

Lesson
- Processing Big Data with Pig
- Processing Big Data with Hive

Lab: Processing Big Data with Pig and Hive
- Processing Big Data with Pig
- Processing Big Data with Hive

After completing this module, you will be able to:
- Use Pig to process Big Data
- Use Hive to process Big Data

MODULE 12: IMPLEMENTING BIG DATA PROCESSING SOLUTIONS WITH WINDOWS AZURE HDINSIGHT
This module introduces key Windows Azure HDInsight technologies that enable you to design and implement automated, repeatable Big Data processing solutions that support self-service BI.

Lesson
• Automating Big Data Processing Tasks
• Integrating Windows Azure HDInsight with Enterprise Data

Lab: Creating a Big Data Solution

• Using HCatalog to Abstract Storage Locations
• Using Oozie to Coordinate a Workflow
• Using Sqoop to Export Data

After completing this module, you will be able to:

• Design and implement an automated Big Data processing solution
• Integrate Windows Azure HDInsight with Self-Service BI Solutions
About this Course

This one-day instructor-led course provides students with the skills to analyze alternative data sets, create dynamic worksheets by using PivotTables, create charts and graphics, automate repetitive tasks, work with other Microsoft Office programs, and collaborate on workbooks.

Audience Profile

This course is intended for novice information workers who want to learn advanced-level Excel 2010 skills.

At Course Completion

After completing this course, students will be able to:

- Define an alternative data set.
- Define multiple alternative data sets.
- Vary your data to get a desired result by using Goal Seek.
- Find optimal solutions by using Solver.
- Analyze data by using descriptive statistics.
- Analyze data dynamically by using PivotTables.
- Filter, show, and hide PivotTable data.
- Edit PivotTables.
- Format PivotTables.
- Create PivotTables from external data.
- Create charts.
- Customize the appearance of charts.
- Find trends in your data.
- Summarize your data by using spark lines.
- Create dynamic charts by using Pivot Charts.
- Create diagrams by using SmartArt.
- Create shapes and mathematical equations.
- Enable and examine macros.
- Create and modify macros.
- Run macros when a button is clicked.
- Run macros when a workbook is opened.
- Include Office documents in workbooks.
- Store workbooks as parts of other Office documents.
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

- Create hyperlinks.
- Paste charts into other documents.
- Share workbooks.
- Manage comments.
- Track and manage colleagues’ changes.
- Protect workbooks and worksheets.
- Authenticate workbooks.
- Save workbooks for the Web.

Prerequisites

Before attending this course, students must have:

- Basic computer knowledge, such as keyboard and mouse skills.
- Basic file-management skills. The student should know how to navigate to folders and files on a computer running Windows 7.

Course Outline

Module 1: Analyze Alternative Data Sets
This module explains how to use alternative data sets to analyze the results of changes to your data.

Lessons

- Defining an Alternative Data Set
- Defining Multiple Alternative Data Sets
- Varying Your Data to Get a Desired Result by Using Goal Seek
- Finding Optimal Solutions by Using Solver
- Analyzing Data by Using Descriptive Statistics

Lab: Defining an Alternative Data Set

- Create a scenario

Lab: Defining Multiple Alternative Data Sets

- Create and view multiple scenarios; summarize scenario results in a separate worksheet

Lab: Varying Your Data to Get a Desired Result by Using Goal Seek

- Use Goal Seek to determine a solution

Lab: Finding Optimal Solutions by Using Solver

- Use Solver to determine a solution

Lab: Analyzing Data by Using Descriptive Statistics

- Use the Analysis Tool Pak to generate statistics

After completing this module, students will be able to:
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

- Define alternative data sets.
- Determine the necessary inputs to make a calculation produce a particular result.

Module 2: Create Dynamic Worksheets by Using PivotTables
This module explains how to use PivotTables to create worksheets that can be sorted, filtered, and rearranged dynamically to emphasize different aspects of the data.

Lessons
- Analyzing Data Dynamically by Using PivotTables
- Filtering, Showing, and Hiding PivotTable Data
- Editing PivotTables
- Formatting PivotTables
- Creating PivotTables from External Data

Lab: Analyzing Data Dynamically by Using PivotTables
- Create, edit, and pivot a PivotTable

Lab: Filtering, Showing, and Hiding PivotTable Data
- Filter a PivotTable by using multiple methods; show and hide details in a PivotTable

Lab: Editing PivotTables
- Rename and reconfigure a PivotTable; create a formula that references PivotTable data

Lab: Formatting PivotTables
- Apply a number format, PivotTable style, banded rows, and conditional formatting; create a custom PivotTable style

Lab: Creating PivotTables from External Data
- Create a PivotTable based on data you import from a text file

After completing this module, students will be able to:
- Create and edit PivotTables from an existing worksheet.
- Focus PivotTable data using filters and Slicers.
- Format PivotTables.
- Create a PivotTable with data from a text file.

Module 3: Create Charts and Graphics
This module explains how to show trends in data by creating charts to summarize a worksheet's data visually, and to use sparklines to summarize the data in a single cell. It also discusses changing the appearance of charts by changing formatting; creating a PivotChart dynamic view of data; adding shapes and mathematical equations; and creating diagrams.

Lessons
- Creating Charts
- Customizing the Appearance of Charts
- Finding Trends in Your Data
- Summarizing Your Data by Using Sparklines
- Creating Dynamic Charts by Using PivotCharts
- Creating Diagrams by Using SmartArt
- Creating Shapes and Mathematical Equations

Lab: Creating Charts
- Create, modify, and move a chart

Lab: Customizing the Appearance of Charts
- Modify the layout and style of a chart; format chart values; create and apply a chart template
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

Lab: Finding Trends in Your Data
- Add a trendline to a chart

Lab: Summarizing Your Data by Using Sparklines
- Create, format, and clear Line, Column, and Win/Loss sparklines

Lab: Creating Dynamic Charts by Using PivotCharts
- Create, update, modify, and filter a PivotChart

Lab: Creating Diagrams by Using SmartArt
- Create, modify, and format an organization chart

Lab: Creating Shapes and Mathematical Equations
- Create, format, reorder, and align shapes; add text and equations to shapes

After completing this module, students will be able to:
- Create a chart and customize its elements.
- Find trends in overall data.
- Summarize data using sparklines.
- Create dynamic charts.
- Create and format shapes, diagrams, and shapes containing mathematical equations.

Module 4: Automate Repetitive Tasks by Using Macros
This module explains how to run and edit macros; make frequently used macros more accessible by assigning them to a new button on the Quick

Access Toolbar; and create macros that run when a workbook is opened.

Lessons
- Enabling and Examining Macros
- Creating and Modifying Macros
- Running Macros When a Button is Clicked
- Running Macros When a Workbook is Opened

Lab: Enabling and Examining Macros
- Examine, step through, and run a macro

Lab: Creating and Modifying Macros
- Record, edit, save, and run a macro

Lab: Running Macros When a Button Is Clicked
- Add macro buttons to the Quick Access Toolbar; assign a macro to a shape; run a macro

Lab: Running Macros When a Workbook Is Opened
- Create and test a macro that runs automatically

After completing this module, students will be able to:
- Open, run, create, and modify macros.
- Create Quick Access Toolbar buttons and shapes in order to run macros with a single mouse click.
- Define macro security settings.
- Run a macro when a workbook is opened.

Module 5: Work with Other Microsoft Office Programs
### Course 50546

**Learn Microsoft Excel 2010 Step by Step, Level 3**

#### COURSE OUTLINE

This module explains how to include Office documents in Excel workbooks, include Excel workbooks in documents, and create hyperlinks in files.

**Lessons**

- Including Office Documents in Workbooks
- Storing Workbooks as Parts of Other Office Documents
- Creating Hyperlinks
- Pasting Charts into Other Documents

**Lab: Including Office Documents in Workbooks**

- Link a presentation to an Excel workbook and edit the presentation from within Excel

**Lab: Storing Workbooks as Parts of Other Office Documents**

- Embed an Excel workbook in a PowerPoint presentation

**Lab: Creating Hyperlinks**

- Create internal and external hyperlinks

**Lab: Pasting Charts into Other Documents**

- Paste an image of a chart into a PowerPoint presentation

After completing this module, students will be able to:

- Include an Office 2010 document in a worksheet.
- Store an Excel workbook as part of another Office document.
- Create hyperlinks.
- Paste and Excel chart into another document.

**Module 6: Collaborate with Colleagues**

This module explains how to make workbooks available to other people; manage their comments; manage changes to workbooks from multiple users; add password protection; digitally sign a workbook; and save a workbook as a Web page.

**Lessons**

- Sharing Workbooks
- Managing Comments
- Tracking and Managing Colleagues' Changes
- Protecting Workbooks and Worksheets
- Authenticating Workbooks
- Saving Workbooks for the Web

**Lab: Sharing Workbooks**

- Share a workbook via e-mail

**Lab: Managing Comments**

- Add, display, review, and delete comments

**Lab: Tracking and Managing Colleagues' Changes**

- Track and accept changes; create a History worksheet

**Lab: Protecting Workbooks and Worksheets**

- Password-protect a workbook, a worksheet, and a range of cells; hide a formula

**Lab: Authenticating Workbooks**

- Create a digital certificate and digitally sign a workbook

**Lab: Saving Workbooks for the Web**

- Include an Office 2010 document in a worksheet.
- Store an Excel workbook as part of another Office document.
- Create hyperlinks.
- Paste and Excel chart into another document.
Course 50546

Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

• Save a workbook as a Web page; publish a PivotTable to the Web

After completing this module, students will be able to:

• Share a workbook.
• Manage comments in workbook cells.
• Track and manage changes made by colleagues.
• Protect workbooks and worksheets.
• Digitally sign workbooks.
• Save workbooks for the Web.
Windows 7, Enterprise Desktop Support Technician
Course#: MS 50331

About this Course
This five-day instructor-led course provides students with the knowledge and skills needed to isolate, document and resolve problems on a Windows 7 desktop or laptop computer. It will also help test takers prepare for the 70-685 and 70-682 exams.

Audience Profile
This course is intended for Windows 7 desktop support technicians who resolve Tier 1 and 2 problems on desktop computers. A minimum of three years of experience configuring and supporting desktop or laptop operating systems is recommended.

At Course Completion
After completing this course, students will be able to:

- Identify and Resolve Desktop Application Issues
- Identify the Cause of and Resolve Networking Issues
- Manage and Maintain Systems That Run Windows 7
- Support Mobile Users
- Identify the Cause of and Resolve Security Issues

Prerequisites
Before attending this course, students must have:
- TCP/IP Troubleshooting skills
- Experience working in a domain environment
- Experience using desktop and command-line troubleshooting tools
- Experience installing and troubleshooting desktop application problems
- Experience configuring registry and group policy settings

Course Outline

Module 1: Identify and Resolve New Software Installation Issues
This module explains how to fix problems that occur during the installation of new software.

Lessons
- Overview
Module 2: Resolve Software Configuration Issues

This module explains how to fix application install problems caused by older programs or new features and options.

Lessons

- Overview
- Change Default Settings on the Image
- Enable and Disable Features
- Pointing to a Network Resource
- Configuring Updates

Module 3: Resolve Software Failure

This module explains how to fix problems with applications that have problems after being installed.

Lessons

- Overview
- Event Viewer
- Event Forwarding
- Application Compatibility Toolkit
- Windows Troubleshooting Platform
- Windows Experience Index
- Testing Compatibility with Safe Mode
- System Restore
- Resolve Software Failure
- Review
Lab : Resolve Software Failure

- Install applications written for older versions of Windows
- Use the Program Compatibility Tool to configure settings for older applications
- Use PowerShell scripts to configure Network Adapters
- Use the Troubleshooter to enable the network adapter
- Install Windows 7 SDK
- Create a Troubleshooting Pack with the SDK
- Configure Event Forwarding
- Use System Restore

After completing this module, students will be able to:

- Configure Event Forwarding
- Use System Restore to fix desktop problems.
- Create a Windows 7 Troubleshooter

Module 4: Identify and Resolve Logon Issues

This module explains how to fix logon problems and configure local and roaming logon profiles.

Lessons

- Overview
- Authentication Process
- Machine Accounts
- Trust Relationships
- Network Services
- User Account Properties
- User Profiles
- Resolve Logon Issues
- Review

Lab : Identify and Resolve Logon Issues

- Join a computer to the domain
- Install Remote Server Administration Tools (RSAT)

Module 5: Identify and Resolve Network Connectivity Issues

This module explains how to troubleshoot connectivity and network problems for client computers.

Lessons

- Overview
- Scope of the Problem
- Hardware Issues
- TCP/IP Configuration
- Network Routing
- IPSec Configuration
- Network Connectivity Tools
- Branch Cache
- Resolve Network Connectivity Issues
- Review

Lab : Identify and Resolve Network Connectivity Issues

- Use command-line tools to identify and fix network connectivity problems
- Fix connectivity problems caused by problem scripts

After completing this module, students will be able to:

- Create Roaming and Mandatory User Profiles
- Configure Machine Accounts in Active Directory
- Configure User Account Properties in Active Directory
COURSE OUTLINE

to:

- Use command-line tools to troubleshoot connectivity problems.
- Use the Windows Troubleshooters to fix configuration issues.
- Configure Advanced TCP/IP options on a client computer

Module 6: Identify and Resolve Name Resolution Issues

This module explains how to use network services and local computer files to resolve computer names.

Lessons

- Overview
- DNS Name Resolution
- Using a Hosts files
- WINS Configuration
- Using LMHOSTS files
- Name Resolution Order
- Manual vs DHCP Configuration
- Resolve Name Resolution Issues
- Review

Lab: Identify and Resolve Name Resolution Issues

- Configure and Test DNS Resolution
- Configure and Test Hosts File Resolution
- Configure and Test NetBIOS Resolution

After completing this module, students will be able to:

- Configure records on a DNS Server
- Configure HOSTS records
- Using command-line and scripting tools to configure TCP/IP settings

Module 7: Identify and Resolve Network Printer Issues

This module explains how to configure printer settings and security.

Lessons

- Overview
- Connecting to a Network Printer
- Managing the Print Spooler
- Setting Printer Priorities
- Creating Printer Pools
- Configuring Drivers
- Printer Schedules
- Printer Permissions
- Manage Printers with Group Policy Settings
- Resolve Network Printer Issues
- Review

Lab: Identify and Resolve Network Printer Issues

- Install local and network printers
- Create and use a separator page
- Configure Printer Redirection and Printer Pooling
- Move the Print Spooler Directory

After completing this module, students will be able to:

- Optimize the performance of the Print Spooler
- Redirect Print Jobs from non-functioning Printers
- Manage Active Directory registration of Printers
- Manage Printer Permissions

Module 8: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons
Module 9: Identify and Resolve Performance Issues

Lab: Identify and Resolve Performance Issues

After completing this module, students will be able to:

- Configure automatic responses to Service failure
- Manage the use of Processing resources by applications
- View and control active connections to a computer
- Optimize Hard-Disk performance.

Module 9: Identify and Resolve Hardware Failure Issues

This module explains how to diagnose hardware problems on a computer.

Lessons

- Overview
- Diagnosing Memory Failure Issues
- Hard Drive Issues
- Network Card Issues
- Power Supply Issues

Lab: Identify and Resolve Hardware Failure Issues

After completing this module, students will be able to:

- Use the Windows Memory Diagnostics Tool
- Fix Hard Disk Errors
- Use the Reliability Monitor
- Use Event Viewer to Find Hardware Information

Module 10: Identify and Resolve Wireless Connectivity Issues

This module explains how to configure reliable and secure wireless connectivity for client computers.

Lessons

- Overview
- Signal Strength
- Wireless Security
- Wireless Profiles
- Management Options for Wireless Devices
- Resolve Wireless Connectivity Issues
- Review

Lab: Identify and Resolve Wireless Connectivity Issues

After completing this module, students will be able to:

- Understand the encryption options available
Module 11: Identify and Resolve Remote Access Issues

This module explains how to configure remote network connections for client computers.

Lessons
- Overview
- Remote Access Methods
- Dial-up Configuration
- VPN Configuration
- DirectAccess Configuration
- Authentication Protocols
- Resolve Remote Access Issues
- Review

Lab: Identify and Resolve Remote Access Issues
- Configure Remote Access settings for a domain user account
- Create and Test a VPN Connection

After completing this module, students will be able to:
- Understand the security options available when creating remote access connections
- Understand the new capabilities of VPN connections that use DirectAccess
- Resolve connectivity problems for VPN and Dial-Up connections

Module 12: Manage File Synchronization

This module explains how to allow end-users to work with network files that are being synchronized on their local desktops or laptops.

Lessons
- Overview
- Configuring Offline File Access
- Synchronization Settings
- Transparent Caching
- Roaming Profiles
- Restoring Network Files
- Resolve File Synchronization Problems
- Review

Lab: Manage File Synchronization
- Configure and Test Offline Files
- Restore the Previous Version of a File

After completing this module, students will be able to:
- Configure Transparent Caching
- Restore deleted network files

Module 13: Identify and Resolve Internet Explorer Security Issues

This module explains how to configure the security features in Internet Explorer to protect user information and privacy.

Lessons
- Overview
- Configure Security Zone
- Configure Security Levels
- Configure Privacy Settings
- Managing Add-ons
- Configure Smart Screen Filter
- Other Security Issues
- Resolve Internet Explorer Security Issues
- Review

Lab: Identify and Resolve Internet Explorer Security Issues
- Configure Trusted Security Zone
Module 14: Identify and Resolve Firewall Issues

This module explains how to configure Windows Firewall to secure network traffic and applications on a computer.

Lessons

- Overview
- Securing Network Applications and Features
- Program and Port Exceptions
- Configuring Notifications and Logging
- Network Security Tools
- Resolve Firewall Issues
- Review

Lab: Identify and Resolve Firewall Issues

- Configure and Test Firewall Rules for an application
- Fix Application Problems Caused by Firewall Rules

After completing this module, students will be able to:

- Block applications from communicating over the network

Module 15: Identify and Resolve Issues Due To Malicious Software

This module explains how to restore a computer system after an attack by viruses or other malicious software.

Lessons

- Overview
- Proactive Malware Protection
- Protecting Internet Explorer
- Windows and Anti-Virus Updates
- Recovering From Malware Infection
- Resolve Issues Due To Malicious Software
- Review

Lab: Identify and Resolve Issues Due To Malicious Software

- Use the Action Center to manage UAC settings
- Use System File Checker
- Use the Malicious Software Removal Tool
- Install Microsoft Security Essentials

After completing this module, students will be able to:

- Identify problems caused by viruses and other malware.
- Fix Application Problems Caused by Firewall Rules
- Fix Application Problems Caused by Firewall Rules
- Install and configure Microsoft Security Essentials
Module 16: Identify and Resolve Encryption Issues

This module explains how to fix problems caused by using encryption on a Windows computer.

Lessons

- Overview
- Configuring a Recovery Agent
- Using EFS
- Using BitLocker
- Encryption Tools
- Resolve Encryption Issues
- Review

Lab: Identify and Resolve Encryption Issues

- Encrypt Files using EFS
- Configure EFS Sharing
- Configure a Recovery Agent

After completing this module, students will be able to:

- Recover from lost encryption keys
- How to encrypt individual files using EFS
- Use BitLocker to protect laptops and insecure computers

Module 17: Identify and Resolve Software Update Issues

This module explains how to enable and use the software update features available in Windows 7.

Lessons

- Overview
- Types of Windows Updates
- Using Windows Update
- Using Microsoft Update
- Resolve Software Update Issues
- Review

Lab: Identify and Resolve Software Update Issues

- Configure Windows Updates using desktop settings
- Configure Windows Updates using Group Policy settings

After completing this module, students will be able to:

- Configure client computers to get updates from the local network instead of the Internet
- Understand the different options available when updating the operating system
- Understand how to configure automatic updates for Microsoft applications
Windows 7, Enterprise Desktop Support Technician

Course#: MS 50331

Length: 5 Days  
Audience: IT Professionals  
Technology: Windows 7  
Type: Hands-On Course  
Delivery Method: Instructor-led Classroom

About this Course

This five-day instructor-led course provides students with the knowledge and skills needed to isolate, document and resolve problems on a Windows 7 desktop or laptop computer. It will also help test takers prepare for the 70-685 and 70-682 exams.

Audience Profile

This course is intended for Windows 7 desktop support technicians who resolve Tier 1 and 2 problems on desktop computers. A minimum of three years of experience configuring and supporting desktop or laptop operating systems is recommended.

At Course Completion

After completing this course, students will be able to:

- Identify and Resolve Desktop Application Issues
- Identify the Cause of and Resolve Networking Issues
- Manage and Maintain Systems That Run Windows 7
- Support Mobile Users
- Identify the Cause of and Resolve Security Issues

Prerequisites

Before attending this course, students must have:

- TCP/IP Troubleshooting skills
- Experience working in a domain environment
- Experience using desktop and command-line troubleshooting tools
- Experience installing and troubleshooting desktop application problems
- Experience configuring registry and group policy settings

Course Outline

Module 1: Identify and Resolve New Software Installation Issues

This module explains how to fix problems that occur during the installation of new software.

Lessons

- Overview
COURSE OUTLINE

- Planning New Software Deployment
- Multilingual Deployment
- Using Group Policy to install software
- Using Software Restriction Policies
- Digitally Signing Software
- Using WMI
- Using Applocker
- Using Virtualization for Testing
- Resolve Software Installation Issues
- Review

Lab : Identify and Resolve New Software Installation Issues

- Create a Repair Disk and Installation Partitions
- Install and Configure Windows 7
- Install Programs and test Applocker
- Configure Compatibility Settings

After completing this module, students will be able to:

- Understand the different installation options for Windows 7
- Understand the different installation options for Windows 7 applications
- Resolve Windows 7 installation problems
- Prevent users from running unapproved applications

Module 2: Resolve Software Configuration Issues

This module explains how to fix application install problems caused by older programs or new features and options.

Lessons

- Overview
- Change Default Settings on the Image
- Enable and Disable Features
- Pointing to a Network Resource
- Configuring Updates
- Resolve Configuration Issues with Group Policy
- Driver Updates
- Problem Steps Recorder
- Resolve Software Configuration Issues
- Review

Lab : Resolve Software Configuration Issues

- Install the Windows Automated Installation Kit
- Create a Windows PE bootable image
- Create a VHD disk
- Install Windows 7 on a VHD
- Boot Windows 7 from a VHD
- Use the Problem Steps Recorder

After completing this module, students will be able to:

- Create a Windows 7 VHD disk
- Configure operating system features
- Understand the impact of Driver Updates
- Fix software configuration problems
- Use the Problem Steps Recorder tool

Module 3: Resolve Software Failure

This module explains how to fix problems with applications that have problems after being installed.

Lessons

- Overview
- Event Viewer
- Event Forwarding
- Application Compatibility Toolkit
- Windows Troubleshooting Platform
- Windows Experience Index
- Testing Compatibility with Safe Mode
- System Restore
- Resolve Software Failure
- Review
Lab : Resolve Software Failure

- Install applications written for older versions of Windows
- Use the Program Compatibility Tool to configure settings for older applications
- Use PowerShell scripts to configure Network Adapters
- Use the Troubleshooter to enable the network adapter
- Install Windows 7 SDK
- Create a Troubleshooting Pack with the SDK
- Configure Event Forwarding
- Use System Restore

After completing this module, students will be able to:

- Configure Event Forwarding
- Use System Restore to fix desktop problems.
- Create a Windows 7 Troubleshooter

Module 4: Identify and Resolve Logon Issues

This module explains how to fix logon problems and configure local and roaming logon profiles.

Lessons

- Overview
- Authentication Process
- Machine Accounts
- Trust Relationships
- Network Services
- User Account Properties
- User Profiles
- Resolve Logon Issues
- Review

Lab : Identify and Resolve Logon Issues

- Join a computer to the domain
- Install Remote Server Administration Tools (RSAT)

Module 5: Identify and Resolve Network Connectivity Issues

This module explains how to troubleshoot connectivity and network problems for client computers.

Lessons

- Overview
- Scope of the Problem
- Hardware Issues
- TCP/IP Configuration
- Network Routing
- IPSec Configuration
- Network Connectivity Tools
- Branch Cache
- Resolve Network Connectivity Issues
- Review

Lab : Identify and Resolve Network Connectivity Issues

- Use command-line tools to identify and fix network connectivity problems
- Fix connectivity problems caused by problem scripts

After completing this module, students will be able to:

- Create Roaming and Mandatory User Profiles
- Configure Machine Accounts in Active Directory
- Configure User Account Properties in Active Directory
MS 50331
Windows 7, Enterprise Desktop Support Technician

COURSE OUTLINE

Module 6: Identify and Resolve Name Resolution Issues

This module explains how to use network services and local computer files to resolve computer names.

Lessons

- Overview
- DNS Name Resolution
- Using a Hosts files
- WINS Configuration
- Using LMHOSTS files
- Name Resolution Order
- Manual vs DHCP Configuration
- Resolve Name Resolution Issues
- Review

Lab: Identify and Resolve Name Resolution Issues

- Configure and Test DNS Resolution
- Configure and Test Hosts File Resolution
- Configure and Test NetBIOS Resolution

After completing this module, students will be able to:

- Configure records on a DNS Server
- Configure HOSTS records
- Using command-line and scripting tools to configure TCP/IP settings

Module 7: Identify and Resolve Network Printer Issues

This module explains how to configure printer settings and security.

Lessons

- Overview
- Connecting to a Network Printer
- Managing the Print Spooler
- Setting Printer Priorities
- Creating Printer Pools
- Configuring Drivers
- Printer Schedules
- Printer Permissions
- Manage Printers with Group Policy Settings
- Resolve Network Printer Issues
- Review

Lab: Identify and Resolve Network Printer Issues

- Install local and network printers
- Create and use a separator page
- Configure Printer Redirection and Printer Pooling
- Move the Print Spooler Directory

After completing this module, students will be able to:

- Optimize the performance of the Print Spooler
- Redirect Print Jobs from non-functioning Printers
- Manage Active Directory registration of Printers
- Manage Printer Permissions

Module 8: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons

- Overview
- Monitoring System Performance
- Controlling Application Resources
- Performance Optimization
- Review

This module explains how to configure printer settings and security.

Lessons

- Overview
- Connecting to a Network Printer
- Managing the Print Spooler
- Setting Printer Priorities
- Creating Printer Pools
- Configuring Drivers
- Printer Schedules
- Printer Permissions
- Manage Printers with Group Policy Settings
- Resolve Network Printer Issues
- Review

Lab: Identify and Resolve Network Printer Issues

- Install local and network printers
- Create and use a separator page
- Configure Printer Redirection and Printer Pooling
- Move the Print Spooler Directory

After completing this module, students will be able to:

- Optimize the performance of the Print Spooler
- Redirect Print Jobs from non-functioning Printers
- Manage Active Directory registration of Printers
- Manage Printer Permissions

Module 8: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.
Module 9: Identify and Resolve Performance Issues

Lab : Identify and Resolve Performance Issues

- Schedule and Perform a Disk Defragmentation
- Using Task Manager
- Using Resource Monitor
- Display a message when a Service stops

After completing this module, students will be able to:

- Configure automatic responses to Service failure
- Manage the use of Processing resources by applications
- View and control active connections to a computer
- Optimize Hard-Disk performance.

Module 9: Identify and Resolve Hardware Failure Issues

This module explains how to diagnose hardware problems on a computer.

Lessons

- Overview
- Diagnosing Memory Failure Issues
- Hard Drive Issues
- Network Card Issues
- Power Supply Issues
- Windows Hardware Diagnostic Tools
- Resolve Hardware Failure Issues
- Review

Lab : Identify and Resolve Hardware Failure Issues

- Use the Windows Memory Diagnostics Tool
- Fix Hard Disk Errors
- Use the Reliability Monitor
- Use Event Viewer to Find Hardware Information

After completing this module, students will be able to:

- Understand how to be proactive in dealing with hardware problems
- Use Windows 7 hardware diagnostic tools

Module 10: Identify and Resolve Wireless Connectivity Issues

This module explains how to configure reliable and secure wireless connectivity for client computers.

Lessons

- Overview
- Signal Strength
- Wireless Security
- Wireless Profiles
- Management Options for Wireless Devices
- Resolve Wireless Connectivity Issues
- Review

Lab : Identify and Resolve Wireless Connectivity Issues

- No Lab Exercises

After completing this module, students will be able to:

- Understand the encryption options available
for wireless networks
- Use Windows 7 Wireless security options
- Fix client connectivity problems

**Module 11: Identify and Resolve Remote Access Issues**

This module explains how to configure remote network connections for client computers.

**Lessons**
- Overview
- Remote Access Methods
- Dial-up Configuration
- VPN Configuration
- DirectAccess Configuration
- Authentication Protocols
- Resolve Remote Access Issues
- Review

**Lab: Identify and Resolve Remote Access Issues**
- Configure Remote Access settings for a domain user account
- Create and Test a VPN Connection

After completing this module, students will be able to:
- Understand the security options available when creating remote access connections
- Understand the new capabilities of VPN connections that use DirectAccess
- Resolve connectivity problems for VPN and Dial-Up connections

**Module 12: Manage File Synchronization**

This module explains how to allow end-users to work with network files that are being synchronized on their local desktops or laptops.

**Lessons**
- Overview
- Configuring Offline File Access
- Synchronization Settings
- Transparent Caching
- Roaming Profiles
- Restoring Network Files
- Resolve File Synchronization Problems
- Review

**Lab: Manage File Synchronization**
- Configure and Test Offline Files
- Restore the Previous Version of a File

After completing this module, students will be able to:
- Configure Transparent Caching
- Restore deleted network files

**Module 13: Identify and Resolve Internet Explorer Security Issues**

This module explains how to configure the security features in Internet Explorer to protect user information and privacy.

**Lessons**
- Overview
- Configure Security Zone
- Configure Security Levels
- Configure Privacy Settings
- Managing Add-ons
- Configure Smart Screen Filter
- Other Security Issues
- Resolve Internet Explorer Security Issues
- Review

**Lab: Identify and Resolve Internet Explorer Security Issues**
- Configure Trusted Security Zone
Module 14: Identify and Resolve Firewall Issues

This module explains how to configure Windows Firewall to secure network traffic and applications on a computer.

Lessons

- Overview
- Securing Network Applications and Features
- Program and Port Exceptions
- Configuring Notifications and Logging
- Network Security Tools
- Resolve Firewall Issues
- Review

Lab: Identify and Resolve Firewall Issues

- Configure and Test Firewall Rules for an application
- Fix Application Problems Caused by Firewall Rules

After completing this module, students will be able to:

- Block applications from communicating over the network

Module 15: Identify and Resolve Issues Due To Malicious Software

This module explains how to restore a computer system after an attack by viruses or other malicious software.

Lessons

- Overview
- Proactive Malware Protection
- Protecting Internet Explorer
- Windows and Anti-Virus Updates
- Recovering From Malware Infection
- Resolve Issues Due To Malicious Software
- Review

Lab: Identify and Resolve Issues Due To Malicious Software

- Use the Action Center to manage UAC settings
- Use System File Checker
- Use the Malicious Software Removal Tool
- Install Microsoft Security Essentials

After completing this module, students will be able to:

- Identify problems caused by viruses and other malware.
- How to protect Internet Explorer and E-mail applications from malware attack
- How to prevent data loss and fix a computer after a malware attack
- Install and configure Microsoft Security Essentials
Module 16: Identify and Resolve Encryption Issues

This module explains how to fix problems caused by using encryption on a Windows computer.

Lessons

- Overview
- Configuring a Recovery Agent
- Using EFS
- Using BitLocker
- Encryption Tools
- Resolve Encryption Issues
- Review

Lab : Identify and Resolve Encryption Issues

- Encrypt Files using EFS
- Configure EFS Sharing
- Configure a Recovery Agent

After completing this module, students will be able to:

- Recover from lost encryption keys
- How to encrypt individual files using EFS
- Use BitLocker to protect laptops and insecure computers

Module 17: Identify and Resolve Software Update Issues

This module explains how to enable and use the software update features available in Windows 7.

Lessons

- Overview
- Types of Windows Updates
- Using Windows Update
- Using Microsoft Update
- Resolve Software Update Issues
- Review

Lab : Identify and Resolve Software Update Issues

- Configure Windows Updates using desktop settings
- Configure Windows Updates using Group Policy settings

After completing this module, students will be able to:

- Configure client computers to get updates from the local network instead of the Internet
- Understand the different options available when updating the operating system
- Understand how to configure automatic updates for Microsoft applications
About this Course

This two-day instructor-led course is designed for the site owner/”power user” of a SharePoint site who needs to know how to create sites and lists, manage user access and customize lists and pages. This class uses the SharePoint Server 2010 version of SharePoint. While it is of equal value for users of SharePoint Foundation, it does include a few features not found in Foundation.

Audience Profile

This course is designed for the site owner/ “power user” of a SharePoint site, who needs to know how to create sites and lists, manage user access and customize lists and pages.

At Course Completion

After completing this course, students will be able to:

- Manage Sites and Site Collections.
- Add users and groups and manage site, list, folder and item security.
- Add and configure web parts.
- Configure sites; include themes, title, description and icon.
- Configure site navigation.
- View site activity reports.
- Customize lists and libraries.
- Work with Site Columns and Site Content Types.
- Create Forms libraries.
- Configure Check out/in, Content Approval and Versioning.
- Create and modify pages and web part pages.

Prerequisites

Before attending this course, students must have:

- Working knowledge of SharePoint 2010 and know how to navigate a SharePoint site and SharePoint lists.
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<td><strong>Module 8: Activity</strong></td>
<td>- Site Collection Web Analytics Reports</td>
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</table>
Microsoft SharePoint 2010 Site Collection and Site Administration  
Course#: MS50547

Length: 5 Days  
Audience: IT Professionals  
Technology: Microsoft SharePoint  
Type: Hands-On course  
Delivery Method: Instructor-led Classroom

About this Course

This five-day instructor-led Site Collection and Site Administrator course gives students who have SharePoint 2010 Owner permissions for a site the ability to manage, administer and modify a SharePoint 2010 site based on business needs and objectives. This course also provides the IT Business Analyst the necessary information to advise business units on which features are a best fit for their business processes. The course will provide students necessary information on SharePoint 2010 features and capabilities including how to implement and Best Practices for implementing the feature. The course will also focus on different aspects of Governance, Office 2010 integration, workflows, web parts and much more, helping students to understand the depth and breadth of SharePoint 2010.

Audience Profile

This course is intended for SharePoint Administrators, SharePoint Developers, Site Collection, Site Administrators and SharePoint Power Users who are tasked with working within the SharePoint environment.

At Course Completion

After completing this course, students will be able to:

- Create and modify SharePoint 2010 objects.
- Understand SharePoint 2010 governance at the site collection and site levels.
- Understand SharePoint 2010 planning principals.
- Understand Office 2010 and SharePoint 2010 integration.
- Modify SharePoint 2010 to improve the built-in search.

Prerequisites

This course requires that you meet the following prerequisites:

- At least 2 years’ experience of working with relational databases, including:
  - Designing a normalized database.
  - Creating tables and relationships.
  - Querying with Transact-SQL.
  - Some basic knowledge of data warehouse schema topology (including star and snowflake schemas).
  - Some exposure to basic programming constructs (such as looping and branching).
  - An awareness of key business priorities such as revenue, profitability, and financial accounting is desirable.
Module 1: SharePoint 2010 General Overview
The SharePoint 2010 family of tools has expanded to include a wider variety of functionality that offers organizations a streamlined process and central location for document management, collaboration and information management. Module 1 provides an overview of the versions and functionalities. It also explains the site collection and site administrator roles.

Lessons
- SharePoint 2010 Site Collection and Site Administrator Roles
- SharePoint 2010 Wheel
- Comparing SharePoint 2010 Versions
- Expanded Browser Capabilities

After completing this module, students will be able to:
- Understand the role of the SharePoint 2010 Site Collection and Site Administrator.
- Understand the SharePoint 2010 Wheel.
- Understand the differences between SharePoint Foundations 2010 and SharePoint 2010.
- Understand the expanded browser capabilities.

Module 2: SharePoint 2010 Environment – Getting Started
This module will cover basic information for Site Collection and Site Administrators. Having a basic set of terminology and getting the “lay of the land” will help to understand the rest of the course.

Lessons
- SharePoint 2010 Environment
- Navigation
- SharePoint 2010 Ribbon
- Adding and Editing Content in SharePoint 2010
- Using Your Name Menu

Module 3: Organization and Development of SharePoint 2010 Sites
For organizations that are implementing or continuing to improve SharePoint 2010, the majority of the work is not found in the day-to-day activities of creating and managing SharePoint 2010 objects. It falls within the realm of governance and establishing best practices for how SharePoint 2010 is used within the organization. Without establishing these principals within the organization, SharePoint 2010 will fail.

Lessons
- Governance and Best Practices
- Information Architecture
- Site Structure
- User Education
- Resources

After completing this module, students will be able to:
- Understand Governance and Best Practices within SharePoint 2010.
- Understand Information Architecture.
- Understand how site structure can help within SharePoint 2010.
- Understand how user education can help with SharePoint 2010.

Module 4: Site Collections, Top Level Sites and Sites
The first major milestone after Governance is the creation of sites within a site collection. Understanding the types of sites available within SharePoint 2010, as well as the process of creating and understanding navigation, is the foundation for site collection and site managers.

Lessons

• Overview of SharePoint 2010 Hierarchy
• SharePoint 2010 Site Inventory
• Creating Sites and Subsites
• Modifying Site Navigation
• Specialty Sites
• Sites and Navigation Best Practices

Lab : Site Collections, Top Level Sites and Sites

• Exercise 1: Create a New Top Level Site
• Exercise 2: Create New Sub-Sites called New and Current Projects and Sales
• Exercise 3: Configure Navigation between the Learning Lake Site
• Exercise 4: Create a Records Center
• Exercise 5: Create a Projects Web Database site for Sales
• Exercise 6: Create and Configure a Visio Process Repository
• Exercise 7: Create a Document Workspace

After completing this module, students will be able to:

• Understand the different types of SharePoint 2010 sites available.
• Know how to create SharePoint 2010 sites.
• Know how to modify site navigation.

Module 5: Creating and Modifying Libraries and Lists

Most of the administrating within SharePoint 2010 is done at the list or library level. This module will dig deeper into both lists and libraries and will help organizations determine what works best for a given situation.

Lessons

• Overview of Libraries
• Creating a Library in SharePoint 2010
• Library Inventory
• Overview of Lists
• Creating a List in SharePoint 2010
• List Inventory
• Library and List Best Practices

Lab : Creating and Modifying Libraries and Lists

• Exercise 1: Create a Custom List
• Exercise 2: Create a New Product Survey
• Exercise 3: Create a List from Excel
• Exercise 4: Create a Document Library
• Exercise 5: Create an Asset Library
• Exercise 6: Create a Wiki Page Library

After completing this module, students will be able to:

• Understand the purpose of lists and libraries.
• Understand the differences between the different lists and libraries.
• Create a list or library using multiple methods.
• Customize a list form using InfoPath 2010.

Module 6: Managing Permissions for Users and Groups

This module will explain how permissions work within a site collection and the tools within SharePoint 2010 that are used to manage and maintain them. Being able to create and manage permissions within SharePoint 2010 is one of the more crucial elements that SharePoint 2010 Site Collection and Site Administrators need to know.

Lessons

• Overview of Permissions and Security in SharePoint 2010
• Permissions within SharePoint 2010
• Managing Permissions within SharePoint 2010
• Stop Inheriting Permissions
• Creating a New SharePoint 2010 Group
• Managing Users and Groups
• Other Permissions Management Tools
Permissions Best Practices

Lab: Managing Permissions for Users and Groups

- Exercise 1: View Permissions of SharePoint 2010 Objects
- Exercise 2: Add Users and Groups to SharePoint 2010 Objects
- Exercise 3: Create a New Managers Group with Customized Permissions
- Exercise 4: Stop Inheriting Permissions between SharePoint 2010 Objects

After completing this module, students will be able to:

- Understand how permissions work within SharePoint 2010.
- Manage permissions within the site collection and site.
- Understand the tools for permissions within SharePoint 2010.

Module 7: Site/Content Management and Collaboration

When a new site is created, the site administrators will need to decide how content is managed within the site. They will also need to consider how sites flow between each other, how information is portrayed, especially at the Welcome Page level, and how content is managed within the site.

Lessons

- Overview of Site and Content Management
- Content Management
- Records Management with the Records Center
- Setting up Alerts and Real Simple Syndication
- Targeting Audiences with Content
- Site and Content Management Best Practices

Lab: Site and Content Management

- Exercise 1: Modify the Current Welcome Page
- Exercise 2: Enable Content Management
- Exercise 3: Enable Content Rating
- Exercise 4: Working with Records Center
- Exercise 5: Enabling and Configuring Audience Targeting

After completing this module, students will be able to:

- Understand the concept of Site and Content Management.
- Implement aspects of Site and Content Management.
- Understand and implement Records Management through Records Center.
- Setup Alerts and Real Simple Syndication feeds.
- Implement Targeting Information for Users.

Module 8: Office 2010 Integration with SharePoint 2010

The heavy integration of Microsoft Office 2010 is one of the main benefits of using SharePoint 2010. There are a myriad of ways to connect SharePoint 2010 to Microsoft Office 2010, whether it is connecting a SharePoint 2010 document library to Microsoft Outlook, linking an Access database or an Excel spreadsheet to a list in SharePoint 2010, using Microsoft InfoPath to build SharePoint 2010 lists, publishing a Visio diagram to be displayed in the web, or managing Microsoft PowerPoint slides in a SharePoint 2010 slide library.

Since a majority of SharePoint 2010 users work out of Outlook most of the day, this integration with SharePoint 2010 helps to focus activities in one or two locations instead of four or five locations. All of these options provide significant improvements over using the products on their own. This module will cover the different ways in which SharePoint 2010 and the Office 2010 Suite work together to expose the full functionality of the products.

Lessons

- Overview of Office 2010 and Office Web App
- Collaborating Using Outlook 2010
- Connecting and Collaborating with Office 2010 Backstage
Connecting, Managing and Editing Documents
Collaborating with PowerPoint 2010
Take Information Offline with SharePoint Workspace 2010
Integration of Visio 2010
Integration of Access 2010
Using InfoPath 2010 with SharePoint 2010
Office 2010 Integration Best Practices

Lab: Office 2010 Integration with SharePoint 2010

Exercise 1: Connect Outlook 2010 with SharePoint 2010
Exercise 2: Collaborate with PowerPoint 2010
Exercise 3: Connect Visio 2010 to Visio Process Repository
Exercise 4: Working with Information Offline with Workspace 2010

After completing this module, students will be able to:

- Understand the integration features between Office 2010 and SharePoint 2010.
- Understand how Office Web Apps works between the two products.
- Understand the collaboration features available with Outlook 2010.
- Understand how Excel and Word interact with SharePoint 2010.
- Understand how PowerPoint can expand collaboration and presentations.
- Understand how SharePoint 2010 can be taken offline with Workspace 2010.
- Understand the integration of Visio and Access with SharePoint 2010.
- Have a basic understanding of how InfoPath 2010 works with SharePoint 2010.

Module 9: Creating Consistency Across Sites
When developing SharePoint 2010, it is necessary to create a consistent feel across sites within the site collection. This objective fits in to the Governance aspects of Module 3: Organization and Development of SharePoint 2010 Sites.

Lessons
- Site Columns
- Site Content Types
- Implementing Document Sets
- Show/Hide the Server Ribbon
- SharePoint Site Themes
- Overview of SharePoint Templates
- Managing Through Site Templates
- Managing Through List and Library Templates
- Page Layout and Site Template Settings
- Consistency Best Practices

Lab: Creating Consistency Across Sites

Exercise 1: Modify the SharePoint 2010 Site Theme
Exercise 2: Create a Site Content Type
Exercise 3: Create Document Set for Learning Lake
Exercise 4: Create a Site Template
Exercise 5: Create a List and Libraries Template
Exercise 6: Designate a Specific Page Layout and Site Templates

After completing this module, students will be able to:

- Understand and use Site Content Types and Columns.
- Understand and Implement Document Sets.
- Implement and Customize SharePoint Site Themes.

Module 10: Finding Information Using Search and Views
One common complaint within organizations is the difficulty finding documents in a timely manner. Many hours are wasted searching for a specific document. This module will show methods for searching and configuring views in order to assist SharePoint 2010 users in finding what they need in much less time.
### Lessons

<table>
<thead>
<tr>
<th>Overview of Views</th>
<th>Implementing Managed Metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adding Columns to Lists and Libraries</td>
<td>Overview of Search</td>
</tr>
<tr>
<td>Creating Views in Lists and Libraries</td>
<td>Implementing Managed Keywords and Best Bets</td>
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<tr>
<td>Configuring Per-Location View</td>
<td>Using SharePoint Search</td>
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<tr>
<td>Overview of Metadata and Taxonomy for SharePoint 2010</td>
<td>Configuring Search Scope</td>
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<td>Configuring Search Visibility</td>
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<td></td>
<td>View and Search Best Practices</td>
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</tbody>
</table>

**Lab: Finding Information Using Search and Views**

<table>
<thead>
<tr>
<th>Exercise 1: Use Sorting and Grouping to Modify a View</th>
<th>Exercise 2: Create a New View for Project Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise 3: Create Calendar and Gantt Chart Views</td>
<td>Exercise 4: Create and Implement Managed Keywords and Best Bets</td>
</tr>
<tr>
<td>Exercise 5: Optimize Project Documents for Search</td>
<td>Exercise 6: Test Search to Find Information</td>
</tr>
</tbody>
</table>

After completing this module, students will be able to:

- Understand and configure multiple types of Views.
- Understand and configure Per-location Views.
- Understand and implement Metadata within SharePoint 2010.
- See how Search and Faceted Search work.
- Configure Search Scopes and Visibility within SharePoint 2010.

### Module 11: Displaying Data with Web Parts in SharePoint 2010

One important feature within SharePoint 2010 is the many different Web Parts. Most of the SharePoint 2010 Web Parts can be customized. This module will cover the different types of Web Parts that are available and the process of embedding and configuring them.

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<thead>
<tr>
<th>Overview of Web Parts</th>
<th>Web Part Inventory</th>
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<tbody>
<tr>
<td>Web Part Inventory</td>
<td>Managing a Web Part on a Page</td>
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<td>Managing a Web Part</td>
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<td>Web Part Maintenance</td>
<td>Web Parts Best Practices</td>
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</tbody>
</table>

**Lab: Displaying Data with Web Parts in SharePoint 2010**

<table>
<thead>
<tr>
<th>Exercise 1: Create and Modify a Web Part Page</th>
<th>Exercise 2: Implement and Configure a Link List Web Part</th>
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</thead>
<tbody>
<tr>
<td>Exercise 3: Direct Tasks to Individuals using Task List Web Part</td>
<td>Exercise 4: Implement and Configure a List View Web Part</td>
</tr>
<tr>
<td>Exercise 5: Connect Web Parts to Display Information</td>
<td>Exercise 6: Use a Content Query Web Part</td>
</tr>
<tr>
<td>Exercise 7: Display Visio Diagrams using Visio Web Access</td>
<td>Exercise 8: Use a Chart Web Part to Display Data</td>
</tr>
</tbody>
</table>

After completing this module, students will be able to:

- Understand the different types of Web Parts.
- Understand how to display Web Parts within a SharePoint 2010 page.
- Understand basic properties used to configure Web Parts.
- Understand how to maintain Web Parts.
Module 12: Document Management through Workflows
An integral part of SharePoint 2010 for document and information management is the ability to configure Workflows. By default, SharePoint 2010 comes with built-in Workflows to help organizations in a variety of different ways, including; approving a new item or document, collecting feedback from multiple users, or disposing of documents based on compliance policies.

Lessons
- Overview of SharePoint 2010 Workflows
- Approval - SharePoint 2010 Workflow
- Three-State Workflow
- Collect Feedback - SharePoint 2010 Workflow
- Collect Signatures - SharePoint 2010 Workflow
- Disposition Workflow
- Managing Workflows in SharePoint 2010

Lab: Document Management through SharePoint 2010 Workflows
- Exercise 1: Create a Workflow to Approve New Projects
- Exercise 2: Create a Feedback Workflow
- Exercise 3: Create a Disposition Approval Workflow

After completing this module, students will be able to:
- Understand Workflows within SharePoint 2010.
- Implement and Configure the Approval – SharePoint 2010 Workflow.
- Implement and Configure the Three-State Workflow.
- Implement and Configure the Collect Feedback – SharePoint 2010 Workflow.
- Implement and Configure the Collect Signatures – SharePoint 2010 Workflow.
- Implement and Configure the Disposition Workflow.
- Understand how to Manage Workflows after created.

Module 13: SharePoint 2010 Social Computing and Collaboration
An important advancement within SharePoint 2010 is the inclusion of Social Computing concepts. Many organizations have similar challenges when working with internal talent management, also known as knowledge management. One common challenge is finding an individual with the specific skills and knowledge needed to complete a task or project. SharePoint 2010 offers a viable platform to help organizations with talent or knowledge management.

Lessons
- Overview of Social Computing
- Using My Sites for Knowledge Management
- Configuring My Profile
- Using Social Tags and Note Boards
- SharePoint 2010 My Site Blog
- SharePoint 2010 Social Computing Best Practices

After completing this module, students will be able to:
- Understand the different components of SharePoint 2010 My Sites.
- Understand how to configure SharePoint 2010 My Profile.
- Understand how Social Tags and Note Boards are integrated into SharePoint 2010.
- Understand how to implement and configure My Site Blogs.

Module 14: Administrating a SharePoint 2010 Site Collection and Site
This module covers SharePoint 2010 topics that Site Collection or Site administrators will work with as part of their day to day activities.

Lessons
• Overview of Administrating of SharePoint 2010
• Additional Settings for Site Administration
• Additional Settings for Site Collection Administration

After completing this module, students will be able to:

• Understand Governance for Site Administration.
• Understand additional settings available for Site Administrators.
• Understand additional settings available for Site Collection Administrators.
Module 1: Introduction to Business Intelligence and Data Modeling
As a SQL Server database professional, you may be required to participate in, or perhaps even lead, a project with the aim of implementing an effective enterprise BI solution. Therefore, it is important that you have a good understanding of the various elements that comprise a BI solution, the business and IT personnel typically involved in a BI project, and the Microsoft products that you can use to implement the solution.

Lessons
- Elements of an Enterprise BI Solution
- The Microsoft Enterprise BI Platform
- Planning an Enterprise BI Project

Lab: Exploring a BI Solution
- Exploring the Data Warehouse
- Exploring the Analysis Services Data Model
- Exploring Reports

After completing this module, you will be able to:
- Describe the elements of a typical BI solution.
- Select appropriate Microsoft technologies for a BI solution.
- Describe key considerations for planning a BI project.

Module 2: Creating Multidimensional Databases
This module provides an introduction to multidimensional databases and introduces the core components of an Online Analytical Processing (OLAP) cube.

Lessons
- Introduction to Multidimensional Analysis
- Creating Data Sources and Data Source Views
- Creating a Cube
- Overview of Cube Security

Lab: Creating a Multidimensional Database
- Creating a Data Source
- Creating and Modifying a Data Source View
- Creating and Modifying a Cube
- Adding a Dimension

After completing this module, you will be able to:
- Describe the considerations for a multidimensional database
- Create data sources and data source views
- Create a cube
- Implement security in a multidimensional database

Module 3: Working with Cubes and Dimensions
This module describes how to create and configure dimensions and dimension hierarchies in an Analysis Services multidimensional data model.

Lessons
- Configuring Dimensions
- Defining Attribute Hierarchies
- Sorting and Grouping Hierarchies

Lab: Defining Dimensions
- Configuring Dimensions and Attributes
- Creating Hierarchies
- Creating a Hierarchy with Attribute Relationships
- Creating a Ragged Hierarchy
- Browsing Dimensions and Hierarchies in a Cube

After completing this module, you will be able to:
Module 4: Working with Measures and Measure Groups
This module describes measures and measure groups. It also explains how you can use them to define fact tables and associate dimensions with measures.

Lessons
- Working with Measures
- Working with Measure Groups

Lab: Configuring Measures and Measure Groups
- Configuring Measures
- Defining a Regular Relationship
- Configuring Measure Group Storage

After completing this module, you will be able to:
- Configure measures
- Configure measure groups

Module 6: Enhancing a Cube
This module describes how to enhance a cube with Key Performance Indicators (KPIs), actions, perspectives, and translations.

Lessons
- Working with Key Performance Indicators
- Working with Actions
- Working with Perspectives
- Working with Translations

Lab: Customizing a Cube
- Implementing an Action
- Implementing Perspectives
- Implementing a Translation

After completing this module, you will be able to:
- Implement Key Performance Indicators
- Implement Actions
- Implement Perspectives
- Implement Translations

Module 5: Introduction to MDX
This module describes the fundamentals of MDX and explains how to build calculations, such as calculated members and named sets.

Lessons
- MDX Fundamentals
- Adding Calculations to a Cube
- Using MDX to Query a Cube

Lab: Using MDX
- Creating Calculated Members
- Querying a Cube by Using MDX

After completing this module, you will be able to:
- Describe MDX
- Add calculations to a cube
- Describe how to use MDX in client applications

Module 7: Implementing an Analysis Services Tabular Data Model
This module describes Analysis Services tabular data models and explains how to develop a tabular data model using the SQL Server Data Tools for Business Intelligence (BI) add-in for Visual Studio.

Lessons
- Introduction to Analysis Services Tabular Data Models
- Creating a Tabular Data Model
- Using an Analysis Services Tabular Data Model in the Enterprise

Lab: Implementing an Analysis Services Tabular Data Model
- Creating an Analysis Services Tabular Data Model Project
- Configuring Columns and Relationships
- Deploying an Analysis Services Tabular Data Model
Module 8: Introduction to DAX
This module explains the fundamentals of the DAX language. It also explains how you can use DAX to create calculated columns and measures, and how you can use them in your tabular data models.

Lessons
- DAX Fundamentals
- Enhancing a Tabular Data Model with DAX

Lab: Using DAX to Enhance a Tabular Data Model
- Creating Calculated Columns
- Creating Measures
- Creating a KPI
- Implementing a Parent-Child Hierarchy

Module 9: Implementing Reports with SQL Server Reporting Services
This module introduces Microsoft SQL Server Reporting Services and discusses the tools and techniques that a professional BI developer can use to create and publish reports.

Lessons
- Introduction to Reporting Services
- Creating a Report with Report Designer
- Grouping and Aggregating Data in a Report
- Publishing and Viewing a Report

Lab: Creating a Report with Report Designer
- Creating a Report
- Grouping and Aggregating Data
- Publishing a Report

Module 10: Enhancing Reports with SQL Server Reporting Services
This module describes how to enhance a SQL Server reporting Services report with charts and other visualizations, and how to use parameters to filter data in a report.

Lessons
- Showing Data Graphically
- Filtering Reports by Using Parameters

Lab: Enhancing a Report
- Adding a Chart to a Report
- Adding Parameters to a Report
- Using Data Bars and Sparklines
- Using a Map

Module 11: Managing Report Execution and Delivery
This module describes how to apply security and report execution settings, and how to create subscriptions to deliver reports.

Lessons
- Managing Report Security
- Managing Report Execution
- Subscriptions and Data Alerts
• Troubleshooting Reporting Services

Lab: Configuring Report Execution and Delivery

• Configuring Report Execution
• Implementing a Standard Subscription
• Implementing a Data-Driven Subscription

After completing this module, you will be able to:

• Configure security settings for a report server.
• Configure report execution settings to optimize performance.
• Use subscriptions and alerts to automate report and data delivery.
• Troubleshoot reporting issues

Module 12: Delivering BI with SharePoint PerformancePoint Services

This module introduces Microsoft SharePoint Server as a platform for BI, and then focuses on building BI dashboards and scorecards with PerformancePoint Services.

Lessons

• Overview of Data Mining
• Creating a Data Mining Solution
• Validating a Data Mining Model
• Consuming Data Mining Data

Lab: Using Data Mining to Support a Marketing Campaign

• Using Table Analysis Tools
• Creating a Data Mining Structure
• Adding a Data Mining Model to a Data Mining Structure
• Validating a Data Mining Model
• Using a Data Mining Model in a Report

Module 13: Performing Predictive Analysis with Data Mining

This module introduces data mining, describes how to create a data mining solution, how to validate data mining models, how to use the Data Mining Add-ins for Microsoft Excel, and how to incorporate data mining results into Reporting Services reports.

Lessons

• Describe SharePoint Server as a BI platform
• Create reports, scorecards, and dashboards

Lab: Implementing a SharePoint Server BI Solution

• Creating a SharePoint Server Site for BI
• Configuring PerformancePoint Data Access
• Creating PerformancePoint Reports
• Creating a PerformancePoint Scorecard
• Creating a PerformancePoint Dashboard

After completing this module, you will be able to:

• Describe SharePoint Server as a BI platform
• Use PerformancePoint Services to deliver BI functionality
• Configure PerformancePoint Data Sources
About this Course

This five-day instructor-led course is intended for power users, who are tasked with working within the SharePoint 2013 environment. This course will provide a deeper, narrowly-focused training on the important and popular skills needed to be an administrator for SharePoint site collections and sites. SharePoint deployment or farm administration skills and tasks, which are required for IT professionals to manage SharePoint 2013, are available in separate Microsoft Official Courseware.

Audience Profile

This course is intended for SharePoint site collection administrators, site administrators and power users who are tasked with working within the SharePoint environment.

At Course Completion

After completing this course, students will be able to:

- Design and implement a company portal structure using SharePoint 2013 objects including sites, libraries, lists and pages
- Explain the role of security and permissions throughout SharePoint 2013
- Implement guidelines for consistency in building a company portal to aid in the day-to-day administration of content in SharePoint 2013
- Enhance the design of and content on a company portal using SharePoint 2013 themes and web parts
- Explain the importance of governance for the planning and managing future growth of the SharePoint 2013 implementation
- Identify options to integrate data from other systems as well as preserve existing data
- Explain the role of social networking in SharePoint 2013 and its impact on collaboration

Prerequisites

Before attending this course, students must have:

- Windows client operating system – either Windows XP, Windows 7 or Windows 8
- Microsoft Office 2007, Office 2010 or Office 2013
- Microsoft Internet Explorer 7, 8 or 9

It is recommended students have familiarity with previous versions of SharePoint, though it is not a required prerequisite.
Module 1: Getting Started with SharePoint 2013
This module introduces SharePoint 2013 concepts to site collection and site administrators. Once administrators can explain basic terminology and how to navigate around SharePoint, they have a solid foundation for the rest of the course.

Lessons
- Exploring SharePoint 2013 Site Collection and Site Administrator Roles
- Defining SharePoint Terminology
- Navigating a SharePoint Site
- Interacting with the Ribbon
- Creating and Editing Basic Content

After completing this module, students will be able to:
- Define SharePoint 2013 roles and terminology
- Navigate SharePoint 2013
- Utilize functions available in the Microsoft ribbon
- Create and add basic content to SharePoint

Module 2: Planning a Company Portal Using SharePoint 2013
Governance in SharePoint plays a critical role in determining the potential success of a SharePoint deployment. When a greater emphasis is placed on governance, it gives organizations a better chance to succeed in the deployment and maintenance of SharePoint. Each organization must ensure that the proper policies and procedures are in place to keep SharePoint aligned with the overall business goals, even as business needs change. This module introduces the concept of governance and highlights best practices.

Lessons
- Defining SharePoint Governance

Module 3: Creating a Company Portal
The first major milestone, after planning the company portal, is executing and building the site structure. The site structure includes the components for storing and presenting information namely sites, lists and libraries and apps, which are new to SharePoint 2013. Because the site structure provides the framework for the entire portal, it is essential that site collection administrators have a firm grasp of creating sites, document libraries and lists, as well as managing navigation.

Lessons
- Creating a Site Structure
- Defining SharePoint Apps
- Customizing Lists and Libraries
- Explaining Views on Lists and Libraries
- Creating Views on Lists and Libraries
- Modifying Navigation

Lab: Creating a Structured Company Portal
- Creating a New Main Department Site
- Creating a New Child Department Site
- Create New Apps for Documents and Lists
- Modifying Columns on an Existing List or Library
- Adding Columns to an Existing List or Library
- Working with Versioning and Content Approval
Module 4: Creating Consistency across Sites
When setting up a SharePoint site collection, it will often involve repeating a certain number of tasks. Site collection administrators can reduce the effort of duplication by creating reusable objects in a central location by using the tools provided. When defining these in a single spot, site collection administrators can more efficiently manage their site collections as well as maintain consistency throughout the site.

Lessons
- Defining Site Columns
- Defining Content Types
- Implementing a Taxonomy
- Configuring the Content Organizer
- Using Templates to Promote Consistency

Lab : Creating Custom Columns and Content Types
- Creating a Content Type
- Applying Content Types to Libraries

Lab : Implementing a Taxonomy
- Designing a Taxonomy
- Adding Managed Metadata Columns

Lab : Configuring the Content Organizer
- Setting Column Default Values

Module 5: Securing a Company Portal
This module explains how permissions work within a site collection, and how the tools within SharePoint 2013 are used to manage and maintain them. It is crucial that SharePoint 2013 site collection and site administrators are able to create and manage permissions within SharePoint 2013.

Lessons
- Explaining Permissions and Security in SharePoint
- Creating SharePoint Groups
- Managing Permissions within SharePoint
- Sharing versus Traditional Security

Lab : Managing Permissions in SharePoint
- Viewing Permissions of SharePoint Objects
- Adding Users and Groups to SharePoint Objects
- Creating a New SharePoint Group with Custom Permissions
- Creating New SharePoint Objects with Unique Permissions

After completing this module, students will be able to:
- Create new site columns
- Design and implement content types
- Implement a taxonomy using the Managed Metadata Service
- Implement the Content Organizer
- Define site and list templates
- Define best practices around creating consistency
• Explain the concept of sharing
• Design and implement security
• Define best practices around SharePoint 2013 security

Module 6: Customizing the Look of a Portal
This module explains how to design a company portal using out-of-the-box web parts and themes in SharePoint 2013.

Lessons
• Changing the Appearance of the Portal
• Editing a Page
• Working with Web Parts and App Parts
• Targeting Audiences with Content

Lab: Adding and Configuring Web Parts
• Creating the Content Type
• Applying the Content Type
• Creating a List Template
• Adding Content to a List
• Creating a Managed Property
• Adding the Content Search Web Part

Lab: Connecting Web Parts
• Creating a Project Site
• Creating an Issue Tracking List
• Updating the Home Page
• Testing the Home Page

Lab: Applying Themes to Your Company Portal
• Adjusting the Theme
• Changing the Logo

After completing this module, students will be able to:
• Implement themes and add a logo
• Add web parts to pages

• Leverage audiences for targeting content

Module 7: Extending a Company Portal
This module covers how companies can extend their SharePoint 2013 environment to include data from other line of business applications using SharePoint Designer 2013. It also explores how companies can leverage SharePoint for records management and eDiscovery.

Lessons
• Creating External Content Types
• Setting up an eDiscovery Center
• Exploring other Records Management Options

Lab: Accessing External Data
• Create the External Content Type
• Creating the Lists and Forms
• Testing the External List
• Working with Business Data Web Parts

Lab: Leveraging Records Management to Preserve Data
• Using a Records Center
• Using an eDiscovery Center

After completing this module, students will be able to:
• Define external content types
• Define and implement records management
• Define and implement an eDiscovery center

Module 8: Leveraging Web Content Management
This module defines the process for using the publishing features of SharePoint 2013 to create rich content pages.

Lessons
MS 53033
SharePoint 2013 Site Collection and Site Administration

COURSE OUTLINE

- Enabling Web Content Management
- Managing the Structure of Web Content
- Navigating a Site Using Managed Metadata
- Configuring a Published Approval Workflow

Lab : Creating a Rich Publishing Site

- Creating a Web Content Management Site
- Creating a News Site
- Setting the Default Page Layout
- Configuring Image Renditions
- Creating News Pages

Lab : Configuring a Published Approval Process

- Adding a Publishing Approval Workflow
- Testing the Workflow

Lab : Implementing a Managed Navigation Site

- Enabling the Managed Metadata Navigation
- Creating Navigation Terms
- Creating Additional News Pages
- Controlling the Navigation and Page Structure

After completing this module, students will be able to:

- Enable web content management
- Create a Managed Metadata navigation site
- Implement image constraints
- Define the structure of pages
- Implement a publishing workflow

Module 9: Bridging the Social Gap
An important advancement in SharePoint 2013 is the expansion of social computing features. Many organizations have challenges when working with internal talent management, also known as knowledge management. For example, an organization may need to find an individual with the specific skills and knowledge to assist in completing a task or project.

SharePoint 2013 offers a viable platform to help organizations with talent or knowledge management.

Lessons

- Configuring Social Features in SharePoint 2013
- Creating a Community Site

Lab : Designing a Social Experience in SharePoint 2013

- Enabling Content Ratings
- Configuring RSS Feeds
- Enabling Social Features in My Profile

Lab : Creating a Community Site

- Creating the Community Site
- Configuring the Community Site
- Creating a Discussion
- Replying to a Discussion
- Managing a Discussion

After completing this module, students will be able to:

- Describe the role of social computing in SharePoint 2013
- Describe best practices for implementing social collaboration
- Design a social experience
- Implement a community site leveraging the social computing features of SharePoint 2013

Module 10: Finding Information Using Search
It is often challenging for many organizations to find information quickly and easily. Users can use the search function within SharePoint 2013 to search across a variety of content sources including documents, people and line of business applications with little to no additional configuration. With a small amount of effort, however, organizations can create a
robust search experience that is in alignment with their business needs. In this module, students will learn how to leverage search within SharePoint 2013 to help users more quickly find the information they need.

Lessons

- Exploring the Search Features of SharePoint 2013
- Configuring the Search Settings

Lab: Configuring an Advanced Search Center

- Connecting to a Search Center
- Creating a Managed Property
- Creating a Result Source
- Configuring the Search Center
- Updating the Refinement Panel
- Updating Search Navigation

After completing this module, students will be able to:

- Create an enterprise Search Center
- Customize the Search Center

Module 12: Administering a Company Portal Built on SharePoint 2013

This module covers other tools and settings in SharePoint 2013. Site collection administrators or site administrators work as part of their day-to-day activities.

Lessons

- Exploring Settings for Site Collection Administrators
- Exploring Settings for Site Administrators

After completing this module, students will be able to:

- Identify additional settings for site collection administrators
- Identify additional settings for site administrators

Module 11: Controlling and Planning for Growth

It is necessary to develop a formal governance plan and committee to maintain quality and consistency in SharePoint. Governance defines policies, procedures and guidelines for how SharePoint will be managed and outlines the roles, responsibilities and actions required to administer and support the SharePoint environment.

Lessons

- Reviewing Governance for Site Administration
- Discussing the Execution of Governance
Mastering Microsoft Project 2013
Course#: 55054A
Exam: 4-343

About this Course

This three-day, instructor-led course is intended for individuals who are interested in expanding their knowledge base and technical skills about Microsoft Project. The course begins with the basic concepts and leads students through all the functions they’ll need to plan and manage a small to medium-size project, including how to level resources and capture both cost and schedule progress.

This course will also help students prepare for Microsoft Project 2013 Exam 74-343 Managing Projects with Microsoft Project 2013.

Audience Profile

This course is intended for both novice and experienced project managers, managers, schedulers, and other project stakeholders who need to incorporate the discipline of project management with Microsoft Project 2013.

At Course Completion

After completing this course, students will be able to:

- Understand the discipline of project management as it applies to using Microsoft Project 2013
- Create a Work Breakdown Structure
- Identify Task Types & Relationships
- Define Resources within Project
- Make Work Package Estimates
- Create an Initial Schedule
- Create Projects from templates, Excel files
- Create Global templates
- Create formulas and graphical indicators
- The steps to record a macro
- Format Output and Print Reports
- Integrate Multiple Projects
- Set up a Project with a Calendar, State date, and Scheduling Method
- Understand Manually Schedule vs. Auto Schedule
- Manage multiple projects
- Be able to create a master project list with shared resources

Prerequisites

There are no prerequisites for attending the course. However, it is helpful to have taken an introductory project management course, such as Versatile’s Principles of Project Management.

Course Outline

Module 1: Introduction to Microsoft Project

This module provides an overview of how the features of Project relate to the job of the project manager. The module also teaches the student how to access different features by navigating through the ribbon.

Lessons

- Describe how Project relates to the discipline of Project Management
- Learn what the new features are in Project 2013
- Navigate to the primary views available using the Ribbon
- Choose Views that display task, resource, or assignment information
After completing this module, students will be able to:

- Select table within views to change the information that is available to see and edit
- Relate the features of Project to the 5 steps for building a plan in Project

**Lab: Introduction to Mastering Microsoft Project**

- Learn how to change views from a table to a chart
- Learn the different subcommands that are under each command group
- Learn what functions are under the format tab
- Learn how to access the backstage

After completing this module, students will be able to:

- Have a fundamental understanding of how Microsoft Project will help them track their projects
- Understand what is new in Project 2013 and how it will increase their productivity
- Learn how the ribbon will help them get the most out of this productivity tool
- Learn how to quickly change views and see what is going on with their projects
- Understand the 5 essential steps in building a successful project plan

**Module 2: A Quick and Easy Overview of Managing with Project**

This module demonstrates the required steps to create and use Microsoft Project 2031 through the life cycle of a project.

**Lessons**

- Create a new project and prepare it for data entry
- Enter project tasks
- Sequence the tasks
- Define resources
- Estimate Task duration and assign resources
- Baseline the project
- Task project progress

**Lab: Creating a Basic Project with a template**

- Learn how to create a project plan from a template
- Learn how to turn off the timeline
- Learn how to change the project start date
- Learn how to add holidays to the company calendar

**Lab: Creating a Basic Project**

- Learn how to add resources and their cost
- Learn how to switch views
- Learn how to insert summary tasks
- Learn how to link tasks and summary tasks

After completing this module, students will be able to:

- Prepare a new project plan and set the date and other basic information
- Enter detailed project information
- Understand how to sequence tasks
- Understand and define basic resource types

- Assign resources to tasks
- Understand the benefits of baselining a project for specific tasks
- Understand the basics of how to track project progress

**Module 3: Setting Up a Project**

This module explains how to create a new project and establish the basic constraints that Microsoft Project 2013 will use for its calculations

**Lessons**

- Use multiple methods to create a new project from an Excel file and a SharePoint Tasks list
- Establish one or more calendars to constrain resource availability
- Configure Project to calculate the schedule from the Start Date forward, or from the Finish Date backward

**Lab: Setting Up a Project**

- Learn how to add Holidays to the company calendar
- Learn how to make a custom calendar
- Learn how to set the Project Start date
- Learn how to set constraints

After completing this module, students will be able to:

- Create a new project using a template, Excel, a SharePoint Tasks List or a new Project file
- Establish one or more calendars to constrain resource availability
- Configure Microsoft Project to calculate the schedule from the Start Date forward or from the Finish Date backward

**Module 4: Manually Schedule vs. Auto Schedule**

This module explains how to manually schedule project tasks and how to leverage the auto schedule feature.

**Lessons**

- Students practice switching tasks between Manually Schedule and Auto Schedule modes. By switching modes, students learn the impact made on the project schedule and the individual tasks.

**Lab: Explore Task Modes**

- Describe which project functions are turned off for tasks using Manually Schedule mode
- Change the task mode from Manually Schedule to AutoSchedule and back
- Identify tasks that are in Manually Schedule mode by the task mode column and shape on the Gantt chart
- Describe situations that are particularly appropriate for using Manually Schedule
- Describe the limitations that a user must be aware of when using Manually Schedule mode.

After completing this module, students will be able to:

- Understand how to turn on Manually Schedule and Auto Schedule
- Understand when to use Manually Schedule
- Understand the limitations of Manually Scheduling.
Module 5: Creating a Work Breakdown Structure
This module explains how to create a useful work breakdown structure and enter it into Microsoft Project.

Lessons
• Build and use summary and subordinate tasks
• Understand and use milestones
• Develop WBS Outlines
• Assign completion criteria
• Evaluate the WBS
• Understand and use WBS templates

Lab: Manipulate a WBS
• Learn how to create and manipulate WBS
• Learn how to utilize an Outline
• Learn how to create notes within tasks

Lab: Supporting the Project Plan
• Learn how to hyperlink project artifacts to your project plan
• Learn how to create reoccurring tasks

After completing this module, students will be able to:
• Build and use summary and subordinate tasks
• Understand and use milestones
• Organize the WBS
• Format the WBS
• Develop WBS outlines
• Assign completion criteria
• Evaluate the WBS
• Understand and use WBS Outlines
• Understand how to link Project artifacts to their projects
• Understand how to create notes on tasks

Module 6: Identifying Task Relationships
This module explains the rules for establishing dependency links between tasks and how to use Project to display these dependencies.

Lessons
• Understand the different types of task relationships
• Understand and use various methods to create relationships
• Determine and display task sequence
• Understand and use lag, lad, and delay

Lab: Display the sequence
• Identify the different ways to create dependent relationships
• Format a Network
diagram
• Modifying dependency lines
• Modifying items to be shown on the critical path

After completing this module, students will be able to:
• Understand the different types of task relationships
• Understand and use various methods to create relationships

Module 7: Defining Resources within Project
This module explains how to enter resources and specific resource information in Microsoft Project and assign resources to specific tasks.

Lessons
• Define resource types
• Define individual resources that will be used on the project
• Record the cost(s) of using each type of resource
• Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Lab: Resource Calendar and Availability
• Add holidays to a standard calendar
• Applying different types of calendars to a project and analyzing the impact to the project schedule
• Applying vacation schedules to the calendar
• Replace resources based upon the resource’s calendar

After completing this module, students will be able to:
• Define the different types of resources
• Define individual resources that will be used on the project
• Record the cost(s) of using each type of resource
• Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Module 8: Making Work Package Estimates
This module explains how Microsoft Project calculates task duration, task work (effort) and task resources. Students will be able to choose among three task types as they enter task estimates and they will know which task type is appropriate for the type of estimate they are making.

Lessons
• Enter estimates for duration and costs for each task
• Distinguish between task types and describe when each is appropriate
• Describe the relationship between work, units and duration
• Describe the way Effort Driven scheduling is affected by work, units and duration
• Assign tasks to resources using the Team Planner view

Lab: Work, Duration and Labor
• Analyze the impact of duration, work and labor
• Create material resources and assigning cost to the resource
• Understand how to leverage Project statistics
• Apply a material resource to a task and examine the impact to project costs

After completing this module, students will be able to:
• Assign values for resources, duration and work
• Understand task types
• Understand Effort Driven scheduling
• Understand material resources and their costs to a project plan.

Module 9: Creating an Initial Schedule

This module explains how Project calculates a schedule based on task relationships and task duration. Students will understand the purpose of identifying critical path tasks and will be able to identify schedule float within the project.

Lessons
• Calculate float and identify a project’s critical path
• Understand and identify task constraints
• Create milestones
• Use the Task Inspector to troubleshoot the initial schedule

Lab: Calculating an Initial Schedule
• Reviewing changes that can have positive or negative impact on the project plan.

After completing this module, students will be able to:
• Identify the critical path
• Understand difference between slack and slippage
• Calculate float
• How to leverage constraints
• How to get the benefit from the Task Inspector, and the impact of changes on a project schedule

Module 10: Create a Resource Leveled Schedule

This module explains how over-allocated resources create unrealistic schedules and shows methods for rescheduling in order to create a realistic schedule based on resource availability.

Lessons
• Adjust a project schedule to account for limited people and other resources
• View the overall cost and schedule of a project
• Identify resources that have been overallocated for a project schedule
• Use multiple ways to adjust tasks and assignments to remove over allocation for any resource

Lab: Resource Leveling
• Evaluate the project’s resource plan using the resource views
• Adjust the schedule manually
• Adjust the schedule using the leveling feature

After completing this module, students will be able to:
• Adjust a project schedule to account for limited resources
• View the overall cost and schedule for a project
• Identify resources that are over-allocated for a project schedule
• Use multiple ways to adjust tasks and assignments to remove over-allocation for any resource

Module 11: Managing the Project

This module explains how to use Microsoft Project to control a project. Students will save their plan to a baseline and see how entering actual task performance data enables them to view differences between planned and actual performance.

Lessons
• Learn how to set a baseline
• Learn how to enter a track project performance data
• Learn how to apply different tracking methods
• Learn how to perform a variance analysis on a project

Lab: The Baseline
• Use Project Statistics to see the changes in a project plan
• Use the variance tables to understand the changes in a project plan
• Understand the value of baselining

Lab: Baselining & Tracking Performance
• Understand the value of Baselining a project
• Understand how to Enter Actuals and measuring their impact

Lab: Variance
• Understand how variance is calculated with cost, finish and work

After completing this module, students will be able to:
• Set a baseline
• Enter and manage project performance data
• Pick a tracking method
• Perform variance analysis
• Sync Projects results with SharePoint

Module 12: Formatting Output and Printing Reports

Participants will be able to control project output by creating and using Custom Fields, Sorting, Filtering and Grouping of the project data.

Lessons
• Print
• Views
• Formats
• Sorting
• Filtering
• Grouping
• Custom Fields
• Reporting
• Other File Formats

Lab: Using the Grouping Feature
• Create new fields to group
• Create new group fields
• Create new views

Lab: Create Reports in Project 2013
• Learn how to leverage Microsoft Project’s View Report features
• Learn how to create a Visual Report

After completing this module, students will be able to:
• Create standardized views, with the power of sorting, filtering and grouping.
• Customize a variety of standard reports
• Learn how to use Visual Reports
• Export reports in a variety of formats

Module 13: Managing Multiple Projects
This module explains how to view many projects as parts of one very large project in order to gain new views on resource availability and task relationships among projects.

Lessons
• Learn how to use common resources among multiple projects
• Learn how to link tasks between multiple projects
• Learn how to create a consolidated view of multiple projects

Lab: Identifying Overallocated Resources from a Resource Pool and Consolidated File
• Learn how to create a master project file
• Open Resource Pool
• Learn how to look for over-allocated resources

After completing this module, students will be able to:
• Use common resources among multiple projects
• Link tasks between multiple projects
• Create a consolidated view of multiple projects and share resources

Module 14: Advanced Topics
This module explains how to leverage some of the advanced features of Microsoft Project.

Lessons
• Learn how to customize the Ribbon and the Quick Access Toolbar
• Learn how to customize WBS numbering
• Learn the concepts of Formulas and Graphical indicators
• Learn the purpose of the Global template and Organizer
• Learn how to use Task Deadlines

Lab: Recording a Macro in Project 2013
• Learn how to create a macro that will automate a process

After completing this module, students will be able to:
• Take advantage of the advance features of Microsoft Project 2013
• Create a Macro
• Share common settings among all future projects

Module 15: Summary
This module provides an overview of the topics presented in the course and how to prepare for Microsoft’s exam 74-343 Microsoft Project 2013, Managing Projects with Project 2013

Lessons
• Learn how to access the Office App Store
• Learn what 74-343 Microsoft Project 2013, Managing Projects with Project 2013 exam will cover and what is in the objective domain
• A sample study guide to help students prepare for the Microsoft Project 2013 exam
Mastering Microsoft Project 2013
Course#: 55054A
Exam: 4-343

Length: 3 Days
Audience: IT Professionals
Level: 200
Technology: Microsoft Office 2013 suites
Type: Hands-on course
Delivery Method: Instructor-led classroom

About this Course

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Audience Profile

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Prerequisites

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Course Outline

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• Select table within views to change the information that is available to see and edit
• Relate the features of Project to the 5 steps for building a plan in Project

Lab: Introduction to Mastering Microsoft Project
• Learn how to change views from a table to a chart
• Learn the different subcommands that are under each command groups
• Learn what functions are under the format tab
• Learn how to access the backstage

After completing this module, students will be able to:
• Have a fundamental understanding of how Microsoft Project will help them track their projects
• Understand what is new in Project 2013 and how it will increase their productivity
• Learn how the ribbon will help them get the most out of this productivity tool
• Learn how to quickly change views and see what is going on with their projects
• Understand the 5 essential steps in building a successful project plan

Module 2: A Quick and Easy Overview of Managing with Project
This module demonstrates the required steps to create and use Microsoft Project 2031 through the life cycle of a project.

Lessons
• Create a new project and prepare it for data entry
• Enter project tasks
• Sequence the tasks
• Define resources
• Estimate Task duration and assign resources
• Baseline the project
• Task project progress

Lab: Creating a Basic Project with a template
• Learn how to create a project plan from a template
• Learn how to turn off the timeline
• Learn how to change the project start date
• Learn how to add holidays to the company calendar

Lab: Creating a Basic Project
• Learn how to add resources and their cost
• Learn how to switch views
• Learn how to insert summary tasks
• Learn how to link tasks and summary tasks

After completing this module, students will be able to:
• Prepare a new project plan and set the date and other basic information
• Enter detailed project information
• Understand how to sequence tasks
• Understand and define basic resource types

• Assign resources to tasks
• Understand the benefits of baselining a project for specific tasks
• Understand the basics of how to track project progress

Module 3: Setting Up a Project
This module explains how to create a new project and establish the basic constraints that Microsoft Project 2013 will use for its calculations

Lessons
• Use multiple methods to create a new project from an Excel file and a SharePoint Tasks list
• Establish one or more calendars to constrain resource availability
• Configure Project to calculate the schedule from the Start Date forward, or from the finish Date backward

Lab: Setting Up a Project
• Learn how to add Holidays to the company calendar
• Learn how to make a custom calendar
• Learn how to set the Project Start date
• Learn how to set constraints

After completing this module, students will be able to:
• Create a new project using a template, Excel, a SharePoint Tasks List or a new Project file
• Establish one or more calendars to constrain resource availability
• Configure Microsoft Project to calculate the schedule from the Start Date forward or from the Finish Date backward

Module 4: Manually Schedule vs. Auto Schedule
This module explains how to manually schedule project tasks and how to leverage the auto schedule feature.

Lessons
• Students practice switching tasks between Manually Schedule and Auto Schedule modes. By switching modes, students learn the impact made on the project schedule and the individual tasks.

Lab: Explore Task Modes
• Describe which project functions are turned off for tasks using Manually Schedule mode
• Change the task mode from Manually Schedule to Auto Schedule and back
• Identify tasks that are in Manually Schedule mode by the task mode column and shape on the Gantt chart
• Describe situations that are particularly appropriate for using Manually Schedule
• Describe the limitations that a user must be aware of when using Manually Schedule mode.

After completing this module, students will be able to:
• Understand how to turn on Manually Schedule and Auto Schedule
• Understand when to use Manually Schedule
• Understand the limitations of Manually Scheduling.
Module 5: Creating a Work Breakdown Structure

This module explains how to create a useful work breakdown structure and enter it into Microsoft Project.

Lessons
- Build and use summary and subordinate tasks
- Understand and use milestones
- Develop WBS Outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS templates

Lab: Manipulate a WBS
- Learn how to create and manipulate WBS
- Learn how to utilize an Outline
- Learn how to create notes within tasks

Lab: Supporting the Project Plan
- Learn how to hyperlink project artifacts to your project plan
- Learn how to create reoccurring tasks

After completing this module, students will be able to:
- Build and use summary and subordinate tasks
- Understand and use milestones
- Organize the WBS
- Format the WBS
- Develop WBS outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS Outlines
- Understand how to link Project artifacts to their projects
- Understand how to create notes on tasks

Module 6: Identifying Task Relationships

This module explains the rules for establishing dependency links between tasks and how to use Project to display these dependencies.

Lessons
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand and use lag, lad, and delay
- Understand the new feature of Task Paths

Lab: Display the sequence
- Identify the different ways to create dependent relationships
- Format a Network diagram
- Modifying dependency lines
- Modifying items to be shown on the critical path

After completing this module, students will be able to:
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand how to use Lag, Lead and Delay

Module 7: Defining Resources within Project

This module explains how to enter resources and specific resource information in Microsoft Project and assign resources to specific tasks.

Lessons
- Define resource types
- Define individual resrouces that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Lab: Resource Calendar and Availability
- Add holidays to a standard calendar
- Applying different types of calendars to a project and analyzing the impact to the project schedule
- Applying vacation schedules to the calendar
- Replace resources based upon the resource’s calendar

After completing this module, students will be able to:
- Define the different types of resources
- Define individual resources that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Module 8: Making Work Package Estimates

This module explains how Microsoft Project calculates task duration, task work (effort) and task resources. Students will be able to choose among three task types as they enter task estimates and they will know which task type is appropriate for the type of estimate they are making.

Lessons
- Enter estimates for duration and costs for each task
- Distinguish between task types and describe when each is appropriate
- Describe the relationship between work, units and duration
- Describe the way Effort Driven scheduling is affected by work, units and duration
- Assign tasks to resources using the Team Planner view

Lab: Work, Duration and Labor
- Analyze the impact of duration, work and labor
- Create material resources and assigning cost to the resource
- Understand how to leverage Project statistics
- Apply a material resource to a task and examine the impact to project costs

After completing this module, students will be able to:
- Assign values for resources, duration and work
- Understand task types
• Understand Effort Driven scheduling
• Understand material resources and their costs to a project plan.

Module 9: Creating an Initial Schedule

This module explains how Project calculates a schedule based on task relationships and task duration. Students will understand the purpose of identifying critical path tasks and will be able to identify schedule float within the project.

Lessons
• Calculate float and identify a project’s critical path
• Understand and identify task constraints
• Create milestones
• Use the Task Inspector to troubleshoot the initial schedule

Lab: Calculating an Initial Schedule
• Reviewing changes that can have positive or negative impact on the project plan.

After completing this module, students will be able to:
• Identify the critical path
• Understand difference between slack and slippage
• Calculate float
• How to leverage constraints
• How to get the benefit from the Task Inspector, and the impact of changes on a project schedule

Module 10: Create a Resource Leveled Schedule

This module explains how over-allocated resources create unrealistic schedules and shows methods for rescheduling in order to create a realistic schedule based on resource availability.

Lessons
• Adjust a project schedule to account for limited people and other resources
• View the overall cost and schedule of a project
• Identify resources that have been overallocated for a project schedule
• Use multiple ways to adjust tasks and assignments to remove over allocation for any resource

Lab: Resource Leveling
• Evaluate the project’s resource plan using the resource views
• Adjust the schedule manually
• Adjust the schedule using the leveling feature

After completing this module, students will be able to:
• Adjust a project schedule to account for limited resources
• View the overall cost and schedule for a project
• Identify resources that are over-allocated for a project schedule
• Use multiple ways to adjust tasks and assignments to remove over-allocation for any resource

Module 11: Managing the Project

This module explains how to use Microsoft Project to control a project. Students will save their plan to a baseline and see how entering actual task performance data enables them to view differences between planned and actual performance.

Lessons
• Learn how to set a baseline
• Learn how to enter a track project performance data
• Learn how to apply different tracking methods
• Learn how to perform a variance analysis on a project

Lab: The Baseline
• Use Project Statistics to see the changes in a project plan
• Use the variance tables to understand the changes in a project plan
• Understand the value of baselining

Lab: Baselining & Tracking Performance
• Understand the value of Baselining a project
• Understand how to Enter Actuals and measuring their impact

Lab: Variance
• Understand how variance is calculated with cost, finish and work

After completing this module, students will be able to:
• Set a baseline
• Enter and manage project performance data
• Pick a tracking method
• Perform variance analysis
• Sync Projects results with SharePoint

Module 12: Formatting Output and Printing Reports

Participants will be able to control project output by creating and using Custom Fields, Sorting, Filtering and Grouping of the project data.

Lessons
• Print
• Views
• Formats
• Sorting
• Filtering
• Grouping
• Custom Fields
• Reporting
• Other File Formats

Lab: Using the Grouping Feature
• Create new fields to group
• Create new group fields
• Create new views

Lab: Create Reports in Project 2013
• Learn how to leverage Microsoft Project’s View Report features
• Learn how to create a Visual Report

After completing this module, students will be able to:
• Create standardized views, with the power of sorting, filtering and grouping.
• Customize a variety of standard reports
• Learn how to use Visual Reports
• Export reports in a variety of formats

Module 13: Managing Multiple Projects
This module explains how to view many projects as parts of one very large project in order to gain new views on resource availability and task relationships among projects.

Lessons
• Learn how to use common resources among multiple projects
• Learn how to link tasks between multiple projects
• Learn how to create a consolidated view of multiple projects

Lab: Identifying Overallocated Resources from a Resource Pool and Consolidated File
• Learn how to create a master project file
• Open Resource Pool
• Learn how to look for over-allocated resources

After completing this module, students will be able to:
• Use common resources among multiple projects
• Link tasks between multiple projects
• Create a consolidated view of multiple projects and share resources

Module 14: Advanced Topics
This module explains how to leverage some of the advanced features of Microsoft Project.

Lessons
• Learn how to customize the Ribbon and the Quick Access Toolbar
• Learn how to customize WBS numbering
• Learn the concepts of Formulas and Graphical indicators
• Learn the purpose of the Global template and Organizer
• Learn how to use Task Deadlines

Lab: Recording a Macro in Project 2013
• Learn how to create a macro that will automate a process

After completing this module, students will be able to:
• Take advantage of the advance features of Microsoft Project 2013
• Create a Macro
• Share common settings among all future projects

Module 15: Summary
This module provides an overview of the topics presented in the course and how to prepare for Microsoft’s exam 74-343 Microsoft Project 2013, Managing Projects with Project 2013

Lessons
• Learn how to access the Office App Store
• Learn what 74-343 Microsoft Project 2013, Managing Projects with Project 2013 exam will cover and what is in the objective domain
• A sample study guide to help students prepare for the Microsoft Project 2013 exam
About this Course

This 3-day Instructor-Led course explores all the basic end user features of SharePoint 2013 including all basic lists and sites (aka “Apps”). Learn to assign basic and advanced permissions. Explore the new project and community sites as well as how to work with the new social features of My Sites. Building and sending search queries is also covered.

Audience Profile

Business users and anyone that works with SharePoint sites on a regular basis.

At Course Completion

After completing this course, students will be able to:

- Understand and work with SharePoint Lists, List Management tasks, Permissions and basic SharePoint Foundation sites, My Sites, Newsfeeds and Search queries.

Prerequisites

Before attending this course, students must have basic understanding of websites and SharePoint sites.

Course Outline

Module 1: SharePoint Introduction

In this module, we are going to answer the all important questions of What and Why should we be using SharePoint. We are also going to look at several of the new and exciting features of SharePoint 2013!

Lessons

- What is SharePoint?
- Why SharePoint?
- What’s New in SharePoint 2013?
- Driving End User Adoption

After completing this module, students will be able to:

- Describe the site topology components of SharePoint
- Describe the new features and capabilities of SharePoint 2013 as compared to older versions
- Describe what business problems SharePoint can address

Module 2: Collaboration Experience

In this module we take a look at the site creation process, common features of the basic team site, advanced features of a Team Site and the new features of SharePoint 2013. We will also take a look at the new features introduced in SharePoint 2013 from a collaboration and UI perspective.

Lessons

- Site Structure
- Basic SharePoint Features
- New SharePoint Features

Lab: SharePoint 2013 UI

- Explore 2013 UI Changes

After completing this module, students will be able to:

- Describe the new UI features of SharePoint 2013
- Understand how the Ribbon works
- Understand how to use the new callouts feature

Module 3: Lists

In this module, we are going to take a look at lists from an end user standpoint, but also very quickly from a database standpoint as well. We will talk about all the basic SharePoint Lists and the new lists in SharePoint 2013 and what things have changed when working with any type of list.

Lessons

- Lists
- List Views
- SharePoint 2013 Features
Lab: Document Library
- Create a document Library
- Create Documents and Folders
- Explore Callouts
- Uploading Documents
- Explorer View

Lab: Form Library
- Create a Form Library
- Create an InfoPath Form
- Publish a Form

Lab: Wiki Pages
- Create Wiki Page Library
- Add Wiki Pages
- Editing Wiki Pages
- History

Lab: Picture Library
- Create a Picture Library
- Upload Pictures
- Picture Views
- Referencing Pictures

Lab: Report Library
- Create a Report Library
- Create a Report
- Upload a Report
- Run a Report
- Reporthistory

Lab: Data connection Library
- Create a Data Connection Library
- Creat/Upload an Office Data Connection (ODC)
- Create/Upload a Universal Data Connection (UDC)

Lab: Asset Library
- Create an Asset Library

Lab: Surveys
- Create a Survey
- Create Questions
- Change question ordering
- Branching Logic
- Fill out the survey
- Anonymous Surveys?

Lab: Custom Lists
- Create a Custom List
- Add one of each column type

Lab: General Lists
- Create an Announcement List

- Create a contact List
- Create a Discussion Board
- Create a Links List
- Create a Calendar
- Create an Issue Tracking List

Lab: Promoted Links
- Creating Promoted Links APP
- Using the Promoted Links APP

Lab: Views
- Creating Views (Standard, DataSheet, Access)
- Adding/Ordering Columns
- Sorting Data
- Filtering Data
- Grouping Data
- Totalling Data
- Setting Style
- Item Limits
- Mobile
- Enabling View
- Datasheet Metadata Editing

Lab: Business Connectivity Services and External Content Types
- Explore External Content Types
- Create a new External Content Type
- Create an External List
- Setup and Configure Permissions for External List
- Add items to an External List

Lab: GeoLocation Field
- Adding a GeoLocation Field

After completing this module, students will be able to:
- Understand when to use a List and when to use a Database
- Create and use the various lists in SharePoint
- Add list columns to tag your content with metadata
- Create Document Sets
- Create External Content Type Lists

Module 4: List Management
We explored the types of lists that come out of the box in the last module.
In this module, we will explore how to manage those lists!

Lessons
- Basic List Management
- Advanced List Management

Lab: List Management
- RSS Feeds
- Check out/Check In
- Document/Item Properties
- Site Columns
Module 5: Permissions

In this module we take a look at SharePoint Permissions. We will learn about SharePoint groups, permission levels, permissions and explore the new Permission Finders.

Lessons
- SharePoint Permissions

Lab: SharePoint Permissions
- Review Default Groups
- Add users to a site
- Requests for access

Module 6: Foundation Site Definitions

In this module we are going to review the SharePoint Foundation site definitions.

Lessons
- Creating Sites
- SharePoint Foundation Sites

Lab: SharePoint Foundation Definitions
- Create Sub Sites (Team Sites)
- Create/Use a Blog Site
- Create/Use a Wiki Site
- Delete a Site
- Restore a Site

Lab: New SharePoint Sites
- Create a Project Site
- Create a Community site
- Work with Badges and Reputation
- Enable Offensive Content Reporting

After completing this module, students will be able to:
- Work with team, blog and wiki sites
- Understand how to create a project and community site.
- Work with a community site (reputation, content moderation, badges, etc)

Module 7: Office Integration

In this module we are going to take a look at how SharePoint and Office interact with each other and how they handle mobile devices.

Lessons
- Web Applications
- Office Integration
Lab: Office Integration
- Outlook offline document libraries
- Viewing calendars
- Syncing tasks
- Viewing contacts
- Excel data reporting
- Access data reporting
- SkyDrive Pro

Lab: Office Web Applications
- Explore Office Web Applications
- Create and edit Word documents in Browser
- Create and edit PowerPoint documents in Browser
- Create and edit OneNote documents in Browser
- Office Web Apps and Search
- Multi-User editing

Lab: Access Services
- Explore Access Services

Lab: Visio Services
- Explore Visio Services

Lab: Site Mailboxes
- Exchange setup
- Creating site mailboxes

Lab: My Tasks
- Understand work management task aggregation
- Explore My Site’s My Tasks
- Exchange Opt-In Task sync

Lab: Site Notebook
- Enable a Site Notebook
- Work with the Site Notebook

Lab: Information Rights Management
- Enable Information rights Management on a Library
- Test IRM

Lab: Machine Translation
- Use Machine Translation in Office Web Apps
- Use Machine Translation in Office Client

After completing this module, students will be able to:
- Describe how SharePoint integrates with Office apps (Outlook, Excel, Access)
- Work offline with documents

- Describe and use Office Web Applications (in browser editing, multi-user editing)
- Use Site Mailboxes and Site Notebooks
- Set up Information Rights Management (IRM)

Module 8: My Site
In this module we will review the new Social Computing features in Sharepoint 2013 and how My Sites has been completely redesigned to support social.

Lessons
- My Site
- What is Social Computing

Lab: My Site
- Create you’re my Site
- Newsfeeds
- Hashtags and Mentions
- Following
- User Profile
- Notification Settings
- Apps
- My Blog
- My Tasks

After completing this module, students will be able to:
- Describe what a My Site is
- Create and modify a My Site
- Work with My Site social networking features (Newsfeeds, Following, Hashtags and Mentions)
- Protect yourself in the Social Computing realm

Module 9: Search
In this module you will learn how to effectively query the Search Index to find items you are looking for.

Lessons
- Performing Queries

Lab: Performing Search Queries
- Performing simple KQL Queries
- Performing complex KQL Queries
- Performing People Searches

After completing this module, students will be able to:
- Perform effective Keyword Queries
- Perform effective People Searches
Microsoft SharePoint 2013 End User Level 1
Course#: MS55050

Length: 3 days
Audience: Information Workers
Level: 200
Technology: Microsoft SharePoint Server 2013
Type: Hands-on Course
Delivery Method: Instructor-led Classroom

About this Course

This 3-day Instructor-Led course explores all the basic end user features of SharePoint 2013 including all basic lists and sites (aka “Apps”). Learn to assign basic and advanced permissions. Explore the new project and community sites as well as how to work with the new social features of My Sites. Building and sending search queries is also covered.

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Microsoft SharePoint 2013 End User Level 2  
Course#: 55052

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About this Course
This 3-day Instructor-Led course explores several advanced topics of working with SharePoint 2013 sites. Topics include SharePoint Server site definitions (Business Intelligence, Document Center, eDiscovery, Education, Search Center, etc), in-depth coverage of Workflows, Site Administration, Site Customization and Site collection Administration.

Audience Profile
This course is intended for people responsible for managing SharePoint sites as Owners or Site Collection Owners. Business and everyday users wanting to learn more advanced tasks of SharePoit sites and site collections.

At Course Completion
After completing this course, students will be able to:

- Explore all the new site admin features exposed in SharePoint 2013. Learn to utilize Workflows, search schemas, site administration, site collection administration and site customization.

Prerequisites
Before attending this course, students must have previous SharePoint End User Level 1 course or several months of working with SharePoint sites.

Course Outline

Module 1: Server Site Definitions
In this module we will explore each of the site definitions that come with SharePoint Server.

Lessons
- SharePoint Server Site Definitions
- Business Intelligence Center
- Publishing
- SharePoint eDiscovery
- SharePoint Education

Lab: Server Site Definitions
- Use the Publishing Portal
- Edit Publishing pages
- Work with Reusable Content
- Review Page History
- Create new Pages
- Use the Records Center
- Setup Send to Connections
- Create Content Organizer Rules
- Submit Records
- Use the Search Center
- Use Business Intelligence Center

Lab: Managed Navigation
- Managed Navigation

Lab: Cross Site Publishing
- Cross site Publishing

Lab: Image Renditions
- Image Renditions

Lab: Embedded Code
- Embedded Code

Lab: SharePoint eDiscovery
- Create discovery Center
- Create a Case
- Create Discovery Sets
- Create Queries
- Explore eDiscovery Exchange Integration

Lab: SharePoint Education
- Explore the SharePoint Education Course Site
- Create and Assign Assignments
- Create Quizzes
Lab: Content Type Hub

- Configure Content Type Hub
- Configure Content Type Publishing

After completing this module, students will be able to:

- Describe each of the SharePoint Server site definitions
- Effectively use the SharePoint Server site definitions
- Utilize the Publishing site for intranet and internet sites (Create pages, content types, page layouts)
- Use the new cross site publishing (List catalogs), image renditions and code snippet features.
- Use Records Center to submit content
- Implement in-place records management
- Set up and use the eDiscovery Center
- Set up and use the SharePoint Education site

Module 2: Search

In this module you will learn how to navigate the basic Search Center provided by SharePoint 2013. You will then explore various ways to customize the Search Center using Search Pages, Web Parts and Result Types.

Lessons

- Search Center Introduction
- Customizing Search Center

Lab: Search Administration

- Search Result Sources
- Search Result Types
- Search Query Results
- Search Schema
- Search Configuration Export and Import
- Search and Offline Availability
- Searchable columns

Lab: Creating Refiners

- Creating Refiners (Custom)
- Creating Refiners (Managed Metadata)
- Configure item counts

Lab: Content Query Web Part

- Using Content Query Web Part
- Implementing Top Likes
- Implementing Most Viewed

After completing this module, students will be able to:

- Describe the Search Center features
- Enhance the Search experience with Site Collection and Site Search Schemas
- Add new search and results pages
- Customize the Search Center using Search Web Parts
- Create and use Result Types
- Create Refiners
  - Using the Content Search Web Part

Module 3: Workflows

In this module we will review the new workflow features of SharePoint 2013.

Lessons

- Workflows in SharePoint 2013

Lab: Built in Activities (2007)

- Use one of each Built-in Activity

Lab: Built in Activities (2010)

- Use one of each Built-in Activity

Lab: Reusable Workflows

- Create Reusable Workflows (Site/Global)
- Export a workflow to Visio
- Import a workflow from Visio
- Save as Template

Lab: Modify OOB Workflow

- Modify Out Of Box Workflows

Lab: Looping Workflow

- Create a looping set of workflows

Lab: Creating Simple 2013 Workflows

- Create a custom workflow using SharePoint Designer 2013
- Work with Stages
- Work with Loops
- Utilize new SharePoint activities

Lab: Creating Visio-based Workflows

- Create a workflow using Visio 2013

Lab: Out Of Box Workflows

- Create/Use Approval WF
- Create/Use Collect Feedback WF
- Create/Use Collect signatures WF
- Create/Use Disposition WF
- Create/Use Three-state WF

After completing this module, students will be able to:

- Build workflows with SharePoint Designer
- Utilize the new Windows Workflow 4.0 in SharePoint 2013
- Understand how to edit built in workflows
- Implement logging in your workflows
- Understand the difference between 2010 and 2013 workflows
- Use the new Stages to implement state machine workflows.

Module 4: Site Administration

In this module we are going to take a quick look at some basic site administration tasks. These are tasks that can be done by site owners.
Lessons
- Basic Site Administration

Lab: Site Administration
- Site Name, Description, Appearance
- Tree View
- Composed Looks and Site Theme
- Navigation
- Regional Settings
- User Alerts
- RSS Settings
- Workflow Settings
- Term store management
- Content and Structure
- Manage Site Features
- Reset to site definition
- Popularity Trends

Lab: Galleries
- Explore Site Column Gallery
- Explore Site Content types Gallery
- Explore Web Parts Gallery
- Explore List templates Gallery
- Explore Master Pages (and page layouts) Gallery
- Explore Solutions Gallery

Lab: Advanced Site Administration
- Site Features
- Hold Reports
- Discover and hold content
- Content Organizer settings
- Content Organizer rules

After completing this module, students will be able to:
- Understand what a Site Administrator is
- Describe all Site Administration tasks
- Administer SharePoint Sites

Module 5: Site Customization
In this module we will take a very brief look at some of the ways to customize your site via the browser and as an end user. There are many more ways at a developer level to customize SharePoint sites, but this module is focused at an end user level.

Lessons
- Using Web Parts
- Site Customization

Lab: Foundation Web Parts
- Web Parts Basics
- Add a web part
- Close a web part
- Delete a web part
- Media and Content Web Parts
- Content Rollup Web Parts
- Social Collaboration Web Parts

Lab: New 2013 Web Parts
- Timeline
- Search-Driven Content Web Parts

Lab: Server Web Parts
- Basic and Audience Targeting
- Business Data
- Office Client Applications

Lab: Filter Web Parts
- Use each of the Filter Web Parts

Lab: Master Page and CSS Customization
- Create a Master Page
- Modify a Master Page
- Custom CSS

Lab: Page Layouts
- Create a new Page Layout
- Create a new Page using a Page Layout

After completing this module, students will be able to:
- Modify the shared and personal view of a site
- Add, remove, close and move web parts to a web part page
- Understand some basic web part on a team site and portal sites
- Make simple changes to SharePoint master pages and CS
- Create page layouts and pages

Module 6: Site Collection Administration
In this module we take a look at all site collection settings and describe what a site collection administrator is, and what they can do.

Lessons
- Site Collection Administration

Lab: Site Collection Administration
- Recycle Bin
- Site Collection Features
- Site Hierarchy
- Site Collection Navigation
- Site engine optimization settings
- Site Collection Audit settings
- Audit Log Reports
- Portal site connection
- Content Type Policy Templates
- Storage Metrics
- Site collection app permissions
- Site policies
- Site collection cache profiles, object cache and output cache
- Suggested Content Browser Locations
Lab: Creating Variations
- Variation Settings
- Variation Labels
- Variation Logs

Lab: List Throttling
- Throttle Large Lists

After completing this module, students will be able to:
- Understand what a Site Collection Administrator is
- Understand where to find and configure site collection settings
- Describe what each of the site collection administration features are
- Be qualified to be a Site Collection Administrator
Ec-Council Certified Ethical Hacker
Exam: 312-50

Length: 5 Days
Audience: IT Professionals
Level: Advanced
Technology: Network Security
Type: Bootcamp
Delivery Method: Instructor-Led Classroom

About this Course

This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack, and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. Students will begin by understanding how perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed. Students then learn how intruders escalate privileges and what steps can be taken to secure a system. Students will also learn about Intrusion Detection, Policy Creation, Social Engineering, DDoSAttacks, Buffer Overflows, and Virus Creation.

Required Exam
CEH Exam 312-50

Audience Profile

This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

At Course Completion

After completing this course, students will have hands on understanding and experience in Ethical Hacking.

Legal Agreement

Ethical Hacking and Countermeasures course mission is to educate, introduce and demonstrate hacking tools for penetration testing purposes only. Prior to attending this course, you will be asked to sign an agreement stating that you will not use the newly acquired skills for illegal or malicious attacks and you will not use such tools in an attempt to compromise any computer system, and to indemnify EC-Council and ATG Learning with respect to the use or misuse of these tools, regardless of intent.

Prerequi sites

- A working knowledge of Linux is strongly recommended
- Strong Microsoft Windows skills and a good understanding of computer networking are required
- CompTIA Security+ and Network+ certification or equivalent knowledge
- At least one year of practical industry experience in networking is strongly recommended

Course Outline

Module 1: Intro To Ethical Hacking
- Internet Crime Current Report: IC3
- Data Breach Investigations Report
- Types of Data Stolen From the Organizations
- Essential Terminologies
- Elements of Information Security
- Authenticity and Non-Repudiation
- The Security, Functionality, and Usability Triangle
- Security Challenges
- Effects of Hacking
- Effects of Hacking on Business
- Who is a Hacker?
- Hacker Classes
- Hacktivism
- What Does a Hacker Do?
- Phase 1 - Reconnaissance
Module 2: Footprinting and Reconnaissance

- Footprinting Terminologies
- What is Footprinting?
- Objectives of Footprinting
- Footprinting Threats
- Finding a Company’s URL
- Locate Internal URLs
- Public and Restricted Websites
- Search for Company’s Information
- Tools to Extract Company’s Data
- Footprinting Through Search Engines
- Collect Location Information
- Satellite Picture of a Residence
- People Search
- People Search Using http://pipl.com
- People Search Online Services
- People Search on Social Networking Services
- Gather Information from Financial Services
- Footprinting Through Job Sites
- Monitoring Target Using Alerts
- Competitive Intelligence Gathering
- Competitive Intelligence-When Did this Company Begin? How Did it Develop?
- Competitive Intelligence-What are the Company’s Plans?
- Competitive Intelligence-What Expert Opinion Say About the Company?
- Competitive Intelligence Tools
- Competitive Intelligence Consulting Companies
- WHOIS Lookup
- WHOIS Lookup Result Analysis

Module 3: Scanning Networks

- Network Scanning
- Types of Scanning
- Checking for Live Systems – ICMP Scanning
- Ping Sweep
- Ping Sweep Tools
- Three-Way Handshake
- TCP Communication Flags
- Create Custom Packet using TCP Flags
- Hping2/Hping3
- Hping Commands
- Scanning Techniques
- TCP Connect/Full Open Scan
- Stealth Scan (Half-open Scan)
- Xmas Scan
- FIN Scan
- NULL Scan
- IDLE Scan
- IDLE Scan: Step1
- IDLE Scan: Step 2.1 (Open Port)
- IDLE Scan: Step 2.2 (Closed Port)
- IDLE Scan: Step 3
- ICMP Echo Scanning/List Scan
• SYN/FIN Scanning Using IP Fragments
• UDP Scanning
• Inverse TCP Flag Scanning
• ACK Flag Scanning
• Scanning: IDS Evasion Techniques
• IP Fragmentation Tools
• Scanning Tool: Nmap
• Scanning Tool: NetScan Tools Pro
• Scanning Tools
• Do Not Scan These IP Addresses (Unless you want to get into trouble)
• Scanning Countermeasures
• War Dialing
• Why War Dialing?
• War Dialing Tools
• War Dialing Countermeasures
• War Dialing Countermeasures: SandTrap Tool
• OS Fingerprinting
• Active Banner Grabbing Using Telnet
• Banner Grabbing Tool: ID Serve
• GET REQUESTS
• Banner Grabbing Tool: Netcraft
• Banner Grabbing Tools
• Banner Grabbing Countermeasures: Disabling or Changing Banner
• Hiding File Extensions
• Hiding file Extensions from Webpages
• Vulnerability Scanning
• Vulnerability Scanning Tool: Nessus
• Vulnerability Scanning Tool: SAINT
• Vulnerability Scanning Tool: GFI LANGuard
• Network Vulnerability Scanners
• LANsurveyor
• Network Mappers
• Proxy Servers
• Why Attackers Use Proxy Servers?
• Use of Proxies for Attack
• How Does MultiProxy Work?
• Free Proxy Servers
• Proxy Workbench
• Proxifier Tool: Create Chain of Proxy Servers
• SocksChain
• TOR (The Onion Routing)
• TOR Proxy Chaining Software
• HTTP Tunneling Techniques
• Why do I Need HTTP Tunneling?
• Super Network Tunnel Tool
• Http Tunnel for Windows
• Additional HTTP Tunneling Tools
• SSH Tunneling
• SSL Proxy Tool
• How to Run SSL Proxy?

• Proxy Tools
• Anonymizers
• Types of Anonymizers
• Case: Bloggers Write Ted Backwards to Bypass Web Filters in China
• Text Conversion to Avoid Filters
• Censorship Circumvention Tool: Psiphon
• How Psiphon Works?
• How to check if Your Website is Blocked in China or Not?
• G-Zapper
• Anonymizer Tools
• Spoofing IP Address
• IP Spoofing Detection Techniques: Direct TTL Probes
• IP Spoofing Detection Techniques: IP Identification Number
• IP Spoofing Detection Techniques: TCP Flow Control Method
• IP Spoofing Countermeasures
• Scanning Pen Testing

Module 4: Enumeration

• What is Enumeration?
• Techniques for Enumeration
• Netbios Enumeration
• NetBIOS Enumeration Tool: SuperScan
• NetBIOS Enumeration Tool: NetBIOS Enumerator
• Enumerating User Accounts
•Enumerating Systems Using Default Passwords
• SNMP (Simple Network Management Protocol) Enumeration
• Management Information Base (MIB)
• SNMP Enumeration Tool: OpUtilis Networking Monitoring Toolset
• SNMP Enumeration Tool: SolarWinds
• SNMP Enumeration Tools
• UNIX/Linux Enumeration
• Linux Enumeration Tool: Enum4linux
• LDAP Enumeration
• LDAP Enumeration Tool: JXplorer
• LDAP Enumeration Tool
• NTP Enumeration
• NTP Server Discovery Tool: NTP Server Scanner
• NTP Server: PresenTense Time Server
• NTP Enumeration Tools
• SMTP Enumeration
• SMTP Enumeration Tool: NetScan Tools Pro
• DNS Zone Transfer Enumeration Using nslookup
• DNS Analyzing and Enumeration Tool: The Men & Mice Suite
• Enumeration Countermeasures
• SMB Enumeration Countermeasures
• Enumeration Pen Testing

Module 5: System Hacking

• Information at Hand Before System Hacking Stage
• System Hacking: Goals
• CEH Hacking Methodology (CHM)
• Password Cracking
• Password Complexity
• Password Cracking Techniques
• Types of Password Attacks
• Passive Online Attacks: Wire Sniffing
• Password Sniffing
• Passive Online Attack: Man-in-the-Middle and Replay Attack
• Active Online Attack: Password Guessing
• Active Online Attack: Trojan/Spyware/Keylogger
• Active Online Attack: Hash Injection Attack
• Rainbow Attacks: Pre-Computed Hash
• Distributed Network Attack
• Elcomsoft Distributed Password Recovery
• Non-Electronic Attacks
• Default Passwords
• Manual Password Cracking (Guessing)
• Automatic Password Cracking Algorithm
• Stealing Passwords Using USB Drive
• Microsoft Authentication
• How Hash Passwords are Stored in Windows SAM?
• What is LAN Manager Hash?
• LM “Hash” Generation
• LM, NTLMv1, and NTLMv2
• NTLM Authentication Process
• Kerberos Authentication
• Salting
• PWdump7 and Fgdump
• L0phtCrack
• Ophcrack
• Cain & Abel
• RainbowCrack
• Password Cracking Tools
• LM Hash Backward Compatibility
• How to Disable LM HASH?
• How to Defend against Password Cracking?
• Implement and Enforce Strong Security Policy
• Privilege Escalation
• Escalation of Privileges
• Active@ Password Changer
• Privilege Escalation Tools
• How to Defend against Privilege Escalation?
• Executing Applications
• Alchemy Remote Executor
• RemoteExec
• Execute This!
• Keylogger
• Types of Keystroke Loggers
• Acoustic/CAM Keylogger
• Keylogger: Advanced Keylogger
• Keylogger: Spytech SpyAgent
• Keylogger: Perfect Keylogger

• Keylogger: Powered Keylogger
• Keylogger for Mac: Aobo Mac OS X KeyLogger
• Keylogger for Mac: Perfect Keylogger for Mac
• Hardware Keylogger: KeyGhost
• Keyloggers
• Spyware
• What Does the Spyware Do?
• Types of Spywares
• Desktop Spyware
• Desktop Spyware: Activity Monitor
• Email and Internet Spyware
• Email and Internet Spyware: eBLASTER
• Internet and E-mail Spyware
• Child Monitoring Spyware
• Child Monitoring Spyware: Advanced Parental Control
• Screen Capturing Spyware
• Screen Capturing Spyware: Spector Pro
• USB Spyware
• USB Spyware: USBDumper
• Audio Spyware
• Audio Spyware: RoboNanny, Stealth Recorder Pro and Spy Voice Recorder
• Video Spyware
• Video Spyware: Net Video Spy
• Print Spyware
• Print Spyware: Printer Activity Monitor
• Telephone/Cellphone Spyware
• Cellphone Spyware: Mobile Spy
• GPS Spyware
• GPS Spyware: GPS TrackMaker
• How to Defend against Keyloggers?
• Anti-Keylogger
• Anti-Keylogger: Zemana AntiLogger
• Anti-Keyloggers
• How to Defend against Spyware?
• Anti-Spyware: Spyware Doctor
• Rootkits
• Types of Rootkits
• How Rootkit Works?
• Rootkit: Fu
• Detecting Rootkits
• Steps for Detecting Rootkits
• How to Defend against Rootkits?
• Anti-Rootkit: RootkitRevealer and McAfee Rootkit Detective
• NTFS Data Stream
• How to Create NTFS Streams?
• NTFS Stream Manipulation
• How to Defend against NTFS Streams?
• NTFS Stream Detector: ADS Scan Engine
• NTFS Stream Detectors
• What is Steganography?
Module 6: Trojans and Backdoors

- What is a Trojan?
- Overt and Covert Channels
- Purpose of Trojans
- What Do Trojan Creators Look For?
- Indications of a Trojan Attack
- Common Ports used by Trojans
- How to Infect Systems Using a Trojan?
- Wrappers
- Wrapper Covert Programs
- Different Ways a Trojan can Get into a System
- How to Deploy a Trojan?
- Evading Anti-Virus Techniques
- Types of Trojans
- Command Shell Trojans
- Command Shell Trojan: Netcat
- GUI Trojan: MoSucker
- GUI Trojan: Jumper and Biodox
- Document Trojans
- E-mail Trojans
- E-mail Trojans: RemoteByMail
- Defacement Trojans
- Defacement Trojans: Restorator
- Botnet Trojans
- Botnet Trojan: Illusion Bot
- Botnet Trojan: NetBot Attacker

- Proxy Server Trojans
- Proxy Server Trojan: W3bPrOxy Tr0j4nCr34t0r (Funny Name)
- FTP Trojans
- FTP Trojan: TinyFTPD
- VNC Trojans
- HTTP/HTTPS Trojans
- HTTP Trojan: HTTP RAT
- Shttpd Trojan - HTTPS (SSL)
- ICMP Tunneling
- ICMP Trojan: icmpsend
- Remote Access Trojans
- Remote Access Trojan: RAT DarkComet
- Remote Access Trojan: Apoclypse
- Covert Channel Trojan: CCTT
- E-banking Trojans
- Banking Trojan Analysis
- E-banking Trojan: ZeuS
- Destructive Trojans
- Notification Trojans
- Credit Card Trojans
- Data Hiding Trojans (Encrypted Trojans)
- BlackBerry Trojan: PhoneSnoop
- MAC OS X Trojan: DNSChanger
- MAC OS X Trojan: DNSChanger
- Mac OS X Trojan: Hell Raiser
- How to Detect Trojans?
- Scanning for Suspicious Ports
- Port Monitoring Tool: IceSword
- Port Monitoring Tools: CurrPorts and TCPView
- Scanning for Suspicious Processes
- Process Monitoring Tool: What's Running
- Process Monitoring Tools
- Scanning for Suspicious Registry Entries
- Registry Entry Monitoring Tools
- Scanning for Suspicious Device Drivers
- Device Drivers Monitoring Tools: DriverView
- Device Drivers Monitoring Tools
- Scanning for Suspicious Windows Services
- Windows Services Monitoring Tools: Windows Service Manager (SvcMan)
- Windows Services Monitoring Tools
- Scanning for Suspicious Startup Programs
- Windows7 Startup Registry Entries
- Startup Programs Monitoring Tools: Starter
- Startup Programs Monitoring Tools: Security AutoRun
- Startup Programs Monitoring Tools
- Scanning for Suspicious Files and Folders
- Files and Folder Integrity Checker: FastSum and WinMD5
- Files and Folder Integrity Checker
- Scanning for Suspicious Network Activities
- Detecting Trojans and Worms with Capsa Network Analyzer
Module 7: Viruses and Worms

- Trojan Countermeasures
- Backdoor Countermeasures
- Trojan Horse Construction Kit
- Anti-Trojan Software: TrojanHunter
- Anti-Trojan Software: Emsisoft Anti-Malware
- Anti-Trojan Softwares
- Pen Testing for Trojans and Backdoors

- Worm Maker: Internet Worm Maker Thing
- What is Sheep Dip Computer?
- Anti-Virus Sensors Systems
- Malware Analysis Procedure
- String Extracting Tool: Bintext
- Compression and Decompression Tool: UPX
- Process Monitoring Tools: Process Monitor
- Log Packet Content Monitoring Tools: NetResident
- Debugging Tool: Ollydbg
- Virus Analysis Tool: IDA Pro
- Online Malware Testing:
  - Sunbelt CWsandbox
- VirusTotal
- Online Malware Analysis Services
- Virus Detection Methods
- Virus and Worms Countermeasures
- Companion Antivirus: Immunet Protect
- Anti-virus Tools
- Penetration Testing for Virus

Module 8: Sniffers

- Lawful Intercept
- Benefits of Lawful Intercept
- Network Components Used for Lawful Intercept
- Wiretapping
- Sniffing Threats
- How a Sniffer Works?
- Hacker Attacking a Switch
- Types of Sniffing: Passive Sniffing
- Types of Sniffing: Active Sniffing
- Protocols Vulnerable to Sniffing
- Tie to Data Link Layer in OSI Model
- Hardware Protocol Analyzers
- SPAN Port
- MAC Flooding
- MAC Address/CAM Table
- How CAM Works?
- What Happens When CAM Table is Full?
- Mac Flooding Switches with macof
- MAC Flooding Tool: Yersinia
- How to Defend against MAC Attacks?
- How DHCP Works?
- DHCP Request/Reply Messages
- IPv4 DHCP Packet Format
- DHCP Starvation Attack
- Rogue DHCP Server Attack
- DHCP Starvation Attack Tool: Gobbler
- How to Defend Against DHCP Starvation and Rogue Server Attack?
- What is Address Resolution Protocol (ARP)?
- ARP Spoofing Attack
- How Does ARP Spoofing Work?
Module 9: Social Engineering

- What is Social Engineering?
- Behaviors Vulnerable to Attacks
- Factors that Make Companies Vulnerable to Attacks
- Why is Social Engineering Effective?
- Warning Signs of an Attack
- Phases in a Social Engineering Attack
- Impact on the Organization
- Command Injection Attacks
- Common Targets of Social Engineering

- Threats of ARP Poisoning
- ARP Poisoning Tool: Cain and Abel
- ARP Poisoning Tool: WinArpAttacker
- ARP Poisoning Tool: Ufasoft Snif
- How to Defend Against ARP Poisoning? Use DHCP Snooping Binding Table and Dynamic ARP Inspection
- Configuring DHCP Snooping and Dynamic ARP Inspection on Cisco Switches
- MAC Spoofing/Duplicating
- Spoofing Attack Threats
- MAC Spoofing Tool: SMAC
- How to Defend Against MAC Spoofing? Use DHCP Snooping Binding Table, Dynamic ARP Inspection and IP Source Guard
- DNS Poisoning Techniques
- Intranet DNS Spoofing
- Internet DNS Spoofing
- Proxy Server DNS Poisoning
- DNS Cache Poisoning
- How to Defend Against DNS Spoofing?
- Sniffing Tool: Wireshark
- Follow TCP Stream in Wireshark
- Display Filters in Wireshark
- Additional Wireshark Filters
- Sniffing Tool: CACE Pilot
- Sniffing Tool: Tcpcap/Windump
- Discovery Tool: NetworkView
- Discovery Tool: The Dude Sniffer
- Password Sniffing Tool: Ace
- Packet Sniffing Tool: Capsa Network Analyzer
- OmniPeek Network Analyzer
- Network Packet Analyzer: Observer
- Session Capture Sniffer: NetWitness
- Email Message Sniffer: Big-Mother
- TCP/IP Packet Crafter: Packet Builder
- Additional Sniffing Tools
- How an Attacker Hacks the Network Using Sniffers?
- How to Defend Against Sniffing?
- Sniffing Prevention Techniques
- How to Detect Sniffing?
- Promiscuous Detection Tool: PromiQuery
- Promiscuous Detection Tool: PromiScan

Module 10: Denial of Service

- What is a Denial of Service?
- What is a Distributed Denial of Service Attack?
- How are Distributed Denial of Service Attacks Executed?
- Symptoms of a DoS Attack?
- Cyber Criminals
- Organized Cyber Crime: Organizational Chart
- Internet Chat Query (ICQ)
- Internet Relay Chat (IRC)
- Anti-Phishing Toolbar: PhishTank
- Identity Theft Countermeasures
- Social Engineering Countermeasures
- Social Engineering Pen Testing
- Social Engineering Pen Testing: Using Mobile Devices
- Social Engineering Pen Testing: Using Phone Numbers
- Social Engineering Pen Testing: In Person

- Common Targets of Social Engineering: Office Workers
- Types of Social Engineering
- Human-Based Social Engineering
- Technical Support Example
- Authority Support Example
- Human-based Social Engineering: Dumpster Diving
- Computer-Based Social Engineering
- Computer-Based Social Engineering: Pop-Ups
- Computer-Based Social Engineering: Phishing
- Social Engineering Using SMS
- Social Engineering by a "Fake SMSSpying Tool"
- Insider Attack
- Disgruntled Employee
- Preventing Insider Threats
- Common Intrusion Tactics and Strategies for Prevention
- Social Engineering Through Impersonation on Social Networking Sites
- Social Engineering Example: LinkedIn Profile
- Social Engineering on Facebook
- Social Engineering on Twitter
- Risks of Social Networking to Corporate Networks
- Identity Theft Statistics 2010
- Identify Theft
- How to Steal an Identity?
- STEP 1
- STEP 2
- STEP 3
- Identity Theft - Serious Problem
- Social Engineering Countermeasures: Policies
- Social Engineering Countermeasures
- How to Detect Phishing Emails?
- Anti-Phishing Toolbar: Netcraft
- Anti-Phishing Toolbar: PhishTank
- Identity Theft Countermeasures
- Social Engineering Pen Testing
- Social Engineering Pen Testing: Using Mobile Devices
- Social Engineering Pen Testing: Using Phone Numbers
- Social Engineering Pen Testing: In Person
Module 11: Session Hijacking

- What is Session Hijacking?
- Dangers posed by Hijacking
- Why Session Hijacking is Successful?
- Key Session Hijacking Techniques
- Brute Forcing
- Brute Forcing Attack
- HTTP Referrer Attack
- Spoofing vs. Hijacking
- Session Hijacking Process
- Packet Analysis of a Local Session Hijack
- Types of Session Hijacking

- Session Hijacking in OSI Model
- Application Level Session Hijacking
- Session Sniffing
- Predictable Session Token
- How to Predict a Session Token?
- Man-in-the-Middle Attack
- Man-in-the-Browser Attack
- Steps to Perform Man-in-the-Browser Attack
- Client-side Attacks
- Cross-site Script Attack
- Session Fixation
- Session Fixation Attack
- Network Level Session Hijacking
- The 3-Way Handshake
- Sequence Numbers
- Sequence Number Prediction
- TCP/IP Hijacking
- IP Spoofing: Source Routed Packets
- RST Hijacking
- Blind Hijacking
- Man-in-the-Middle Attack using Packet Sniffer
- UDP Hijacking
- Session Hijacking Tools
- Paros
- Burp Suite
- Firesheep
- Countermeasures
- Protecting against Session Hijacking
- Methods to Prevent Session Hijacking: To be Followed by Web Developers
- Methods to Prevent Session Hijacking: To be Followed by Web Users
- Defending against Session Hijack Attacks
- Session Hijacking Remediation
- IPSec
- Modes of IPSec
- IPSec Architecture
- IPSec Authentication and Confidentiality
- Components of IPSec
- IPSec Implementation
- Session Hijacking Pen Testing

Module 12: Hijacking Webservers

- Webserver Market Shares
- Open Source Webserver Architecture
- IIS Webserver Architecture
- Website Defacement
- Case Study
- Why Web Servers are Compromised?
- Impact of Webserver Attacks
- Webserver Misconfiguration
- Example
Module 13: Hacking Web Applications

- Web Application Security Statistics

- Directory Traversal Attacks
- HTTP Response Splitting Attack
- Web Cache Poisoning Attack
- HTTP Response Hijacking
- SSH Bruteforce Attack
- Man-in-the-Middle Attack
- Webserver Password Cracking
- Webserver Password Cracking Techniques
- Web Application Attacks
- Webserver Attack Methodology
- Information Gathering
- Webserver Footprinting
- Webserver Footprinting Tools
- Mirroring a Website
- Vulnerability Scanning
- Session Hijacking
- Hacking Web Passwords
- Webserver Attack Tools
- Metasploit
- Metasploit Architecture
- Metasploit Exploit Module
- Metasploit Payload Module
- Metasploit Auxiliary Module
- Metasploit NOPS Module
- Wfeth
- Web Password Cracking Tool
- Brutus
- THC-Hydra
- Countermeasures
- Patches and Updates
- Protocols
- Accounts
- Files and Directories
- How to Defend Against Web Server Attacks?
- How to Defend against HTTP Response Splitting and Web Cache Poisoning?
- Patches and Hotfixes
- What is Patch Management?
- Identifying Appropriate Sources for Updates and Patches
- Installation of a Patch
- Patch Management Tool: Microsoft Baseline Security Analyzer (MBSA)
- Patch Management Tools
- Web Application Security Scanner: Sandcat
- Web Server Security Scanner: Wikto
- Webserver Malware Infection Monitoring Tool: HackAlert
- Webserver Security Tools
- Web Server Penetration Testing

Module 13: Hacking Web Applications

- Introduction to Web Applications
- Web Application Components
- How Web Applications Work?
- Web Application Architecture
- Web 2.0 Applications
- Vulnerability Stack
- Web Attack Vectors
- Web Application Threats - 1
- Web Application Threats - 2
- Unvalidated Input
- Parameter/Form Tampering
- Directory Traversal
- Security Misconfiguration
- Injection Flaws
- SQL Injection Attacks
- Command Injection Attacks
- Command Injection Example
- File Injection Attack
- What is LDAP Injection?
- How LDAP Injection Works?
- Hidden Field Manipulation Attack
- Cross-Site Scripting (XSS) Attacks
- How XSS Attacks Work?
- Cross-Site Scripting Attack Scenario: Attack via Email
- XSS Example: Attack via Email
- XSS Example: Stealing Users' Cookies
- XSS Example: Sending an Unauthorized Request
- XSS Attack in Blog Posting
- XSS Attack in Comment Field
- XSS Cheat Sheet
- Cross-Site Request Forgery (CSRF) Attack
- How CSRF Attacks Work?
- Web Application Denial-of-Service (DoS) Attack
- Denial of Service (DoS) Examples
- Buffer Overflow Attacks
- Cookie/Session Poisoning
- How Cookie Poisoning Works?
- Session Fixation Attack
- Insufficient Transport Layer Protection
- Improper Error Handling
- Insecure Cryptographic Storage
- Broken Authentication and Session Management
- Unvalidated Redirects and Forwards
- Web Services Architecture
- Web Services Attack
- Web Services Footprinting Attack
- Web Services XML Poisoning
- Footprint Web Infrastructure
- Footprint Web Infrastructure: Server Discovery
- Footprint Web Infrastructure: Server Identification/Banner Grabbing
- Footprint Web Infrastructure: Hidden Content Discovery
Module 14: SQL Injection

- SQL Injection is the Most Prevalent Vulnerability in 2010
- SQL Injection Threats
- What is SQL Injection?
- SQL Injection Attacks
- How Web Applications Work?
- Server Side Technologies
- HTTP Post Request
- Example 1: Normal SQL Query
- Example 1: SQL Injection Query
- Example 1: Code Analysis
- Example 2: BadProductList.aspx
- Example 2: Attack Analysis
- Example 3: Updating Table
- Example 4: Adding New Records
- Example 5: Identifying the Table Name
- Example 6: Deleting a Table
- SQL Injection Detection
- SQL Injection Error Messages
- SQL Injection Attack Characters
- Additional Methods to Detect SQL Injection
- SQL Injection Black Box Pen Testing
- Testing for SQL Injection
- Types of SQL Injection
- Simple SQL Injection Attack
- Union SQL Injection Example
- SQL Injection Error Based
- What is Blind SQL Injection?
- No Error Messages Returned
- Blind SQL Injection: WAITFOR DELAY YES or NO Response
- Blind SQL Injection - Exploitation (MySQL)
- Blind SQL Injection - Extract Database User
- Blind SQL Injection - Extract Database Name
Module 15: Hacking Wireless Networks

- Wireless Networks
- Wi-Fi Usage Statistics in the US
- Wi-Fi Hotspots at Public Places
- Wi-Fi Networks at Home
- Types of Wireless Networks
- Wireless Standards
- Service Set Identifier (SSID)
- Wi-Fi Authentication Modes

Wi-Fi Authentication Process - Extract Column Name
Wi-Fi Authentication Process - Extract Data from ROWS
SQL Injection Methodology
Information Gathering
Extracting Information through Error Messages
Understanding SQL Query
Bypass Website Logins Using SQL Injection
Database, Table, and Column Enumeration
Advanced Enumeration
Features of Different DBMSs
Creating Database Accounts
Password Grabbing
Grabbing SQL Server Hashes
Extracting SQL Hashes (In a Single Statement)
Transfer Database to Attacker's Machine
Interacting with the Operating System
Interacting with the File System
Network Reconnaissance Full Query
SQL Injection Tools
SQL Injection Tools: BSQHacker
SQL Injection Tools: Marathon Tool
SQL Injection Tools: SQL Power Injector
SQL Injection Tools: Havij
Evading IDS
Types of Signature Evasion Techniques
Evasion Technique: Sophisticated Matches
Evasion Technique: Hex Encoding
Evasion Technique: Manipulating White Spaces
Evasion Technique: In-line Comment
Evasion Technique: Char Encoding
Evasion Technique: String Concatenation
Evasion Technique: Obfuscated Codes
How to Defend Against SQL Injection Attacks?
How to Defend Against SQL Injection Attacks: Use Type-Safe SQL Parameters
SQL Injection Detection Tools
SQL Injection Detection Tool: Microsoft Source Code Analyzer
SQL Injection Detection Tool: Microsoft URIScan
SQL Injection Detection Tool: dotDefender
SQL Injection Detection Tool: IBM AppScan
Snort Rule to Detect SQL Injection Attacks

Wi-Fi Authentication Process Using a Centralized Authentication Server
Wi-Fi Authentication Process
Wireless Terminologies
Wi-Fi Chaking
Wi-Fi Chaking Symbols
Wi-Fi Hotspot Finder: jiwire.com
Wi-Fi Hotspot Finder: WeFi.com
Types of Wireless Antenna
Parabolic Grid Antenna
Types of Wireless Encryption
WEP Encryption
How WEP Works?
What is WPA?
How WPA Works?
Temporal Keys
What is WPA2?
How WPA2 Works?
WEP vs. WPA vs. WPA2
WEP Issues
Weak Initialization Vectors (IV)
How to Break WEP Encryption?
How to Break WPA/WPA2 Encryption?
How to Defend Against WPA Cracking?
Wireless Threats: Access Control Attacks
Wireless Threats: Integrity Attacks
Wireless Threats: Confidentiality Attacks
Wireless Threats: Availability Attacks
Wireless Threats: Authentication Attacks
Rogue Access Point Attack
Client Mis-association
Misconfigured Access Point Attack
Unauthorized Association
Ad Hoc Connection Attack
HoneySpot Access Point Attack
AP MAC Spoofing
Denial-of-Service Attack
Jamming Signal Attack
Wi-Fi Jamming Devices
Wireless Hacking Methodology
Find Wi-Fi Networks to Attack
Attackers Scanning for Wi-Fi Networks
Footprint the Wireless Network
Wi-Fi Discovery Tool: inSSIDer
Wi-Fi Discovery Tool: NetSurveyor
Wi-Fi Discovery Tool: NetStumbler
Wi-Fi Discovery Tool: Vistumbler
Wi-Fi Discovery Tool: WirelessMon
Wi-Fi Discovery Tools
GPS Mapping
GPS Mapping Tool: WIGLE
### Module 16: Evading IDS, Firewalls, and Honeypots

- Intrusion Detection Systems (IDS) and its Placement
- How IDS Works?
- Ways to Detect an Intrusion
- Types of Intrusion Detection Systems
- System Integrity Verifiers (SIV)
- General Indications of Intrusions
- General Indications of System Intrusions
- Firewall
- Firewall Architecture
- DeMilitarized Zone (DMZ)
- Types of Firewall
- Packet Filtering Firewall
- Circuit-Level Gateway Firewall
- Application-Level Firewall
- Stateful Multilayer Inspection Firewall
- Firewall Identification
- Port Scanning
- Firewalking
- Banner Grabbing
- Honeypot
- Types of Honeypots
- How to Set Up a Honeypot?
- Intrusion Detection Tool
- Snort
- Snort Rules
- Rule Actions and IP Protocols
- The Direction Operator and IP Addresses
- Port Numbers

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### GPS Mapping Tool: Skyhook
- How to Discover Wi-Fi Network Using Wardriving?
- Wireless Traffic Analysis
- Wireless Cards and Chipsets
- Wi-Fi USB Dongle: AirPcap
- Wi-Fi Packet Sniffer: Wireshark with AirPcap
- Wi-Fi Packet Sniffer: Wi-Fi Pilot
- Wi-Fi Packet Sniffer: OmniPeek
- Wi-Fi Packet Sniffer: CommView for Wi-Fi
- What is Spectrum Analysis?
- Wireless Sniffers
- Aircrack-ng Suite
- How to Reveal Hidden SSIDs
- Fragmentation Attack
- How to Launch MAC Spoofing Attack?
- Denial of Service: Deauthentication and Disassociation Attacks
- Man-in-the-Middle Attack
- MITM Attack Using Aircrack-ng
- Wireless ARP Poisoning Attack
- Rogue Access Point
- Evil Twin
- How to Set Up a Fake Hotspot (Evil Twin)?
- How to Crack WEP Using Aircrack?
- How to Crack WEP Using Aircrack? Screenshot 1/2
- How to Crack WEP Using Aircrack? Screenshot 2/2
- How to Crack WPA-PSK Using Aircrack?
- WPA Cracking Tool: KisMAC
- WEP Cracking Using Cain & Abel
- WPA Brute Forcing Using Cain & Abel
- WPA Cracking Tool: Elcomsoft Wireless Security Auditor
- WEP/WPA Cracking Tools
- Wi-Fi Sniffer: Kismet
- Wardriving Tools
- RF Monitoring Tools
- Wi-Fi Connection Manager Tools
- Wi-Fi Traffic Analyzer Tools
- Wi-Fi Raw Packet Capturing Tools
- Wi-Fi Spectrum Analyzing Tools
- Bluetooth Hacking
- Bluetooth Stack
- Bluetooth Threats
- How to BlueJack a Victim?
- Bluetooth Hacking Tool: Super Bluetooth Hack
- Bluetooth Hacking Tool: PhoneSnoop
- Bluetooth Hacking Tool: BlueScanner
- Bluetooth Hacking Tools
- How to Defend Against Bluetooth Hacking?
- How to Detect and Block Rogue AP?
- Wireless Security Layers
- How to Defend Against Wireless Attacks?
- Wireless Intrusion Prevention Systems

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### Module 16: Evading IDS, Firewalls, and Honeypots

- Wireless IPS Deployment
- Wi-Fi Security Auditing Tool: AirMagnet WiFi Analyzer
- Wi-Fi Security Auditing Tool: AirDefense
- Wi-Fi Security Auditing Tool: Adaptive Wireless IPS
- Wi-Fi Security Auditing Tool: Aruba RFProtect WIPS
- Wi-Fi Intrusion Prevention System
- Wi-Fi Predictive Planning Tools
- Wi-Fi Vulnerability Scanning Tools
- Wireless Penetration Testing
- Wireless Penetration Testing Framework
- Wi-Fi Pen Testing Framework
- Pen Testing LEAP Encrypted WLAN
- Pen Testing WPA/WPA2 Encrypted WLAN
- Pen Testing WEP Encrypted WLAN
- Pen Testing Unencrypted WLAN

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• Intrusion Detection Systems: Tipping Point
• Intrusion Detection Tools
• Firewall: Sunbelt Personal Firewall
• Firewalls
• Honeypot Tools
• KFSensor
Module 17: Buffer Overflow

- SPECTER
- Insertion Attack
- Evasion
- Denial-of-Service Attack (DoS)
- Obfuscating
- False Positive Generation
- Session Splicing
- Unicode Evasion Technique
- Fragmentation Attack
- Overlapping Fragments
- Time-To-Live Attacks
- Invalid RST Packets
- Urgency Flag
- Polymorphic Shellcode
- ASCII Shellcode
- Application-Layer Attacks
- Desynchronization
- Pre Connection SYN
- Post Connection SYN
- Other Types of Evasion
- IP Address Spoofing
- Attacking Session Token Generation Mechanism
- Tiny Fragments
- Bypass Blocked Sites Using IP Address in Place of URL
- Bypass Blocked Sites Using Anonymous Website Surfing Sites
- Bypass a Firewall using Proxy Server
- Bypassing Firewall through ICMP Tunneling Method
- Bypassing Firewall through ACK Tunneling Method
- Bypassing Firewall through HTTP Tunneling Method
- Bypassing Firewall through External Systems
- Bypassing Firewall through MITM Attack
- Detecting Honeypots
- Honeypot Detecting Tool: Send-Safe Honeypot Hunter
- Firewall Evasion Tools
- Traffic IQ Professional
- tcp-over-dns
- Firewall Evasion Tools
- Packet Fragment Generators
- Countermeasures
- Firewall/IDS Penetration Testing
- Firewall Penetration Testing
- IDS Penetration Testing

Module 18: Cryptography

- Shellcode
- No Operations (NOPs)
- Knowledge Required to Program Buffer Overflow Exploits
- Buffer Overflow Steps
- Attacking a Real Program
- Format String Problem
- Overflow using Format String
- Smashing the Stack
- Once the Stack is Smashed...
- Simple Uncontrolled Overflow
- Simple Buffer Overflow in C
- Code Analysis
- Exploiting Semantic Comments in C (Annotations)
- How to Mutate a Buffer Overflow Exploit?
- Identifying Buffer Overflows
- How to Detect Buffer Overflows in a Program?
- BOU (Buffer Overflow Utility)
- Testing for Heap Overflow Conditions: heap.exe
- Steps for Testing for Stack Overflow in OllyDbg Debugger
- Testing for Stack Overflow in OllyDbg Debugger
- Testing for Format String Conditions using IDA Pro
- BoF Detection Tools
- Defense Against Buffer Overflows
- Preventing BoF Attacks
- Programming Countermeasures
- Data Execution Prevention (DEP)
- Enhanced Mitigation Experience Toolkit (EMET)
- EMET System Configuration Settings
- EMET Application Configuration Window
- /GS http://microsoft.com
- BoF Security Tools
- BufferShield
- Buffer Overflow Penetration Testing

Module 17: Buffer Overflow

- Buffer Overflows
- Why are Programs And Applications Vulnerable?
- Understanding Stacks
- Stack-Based Buffer Overflow
- Understanding Heap
- Heap-Based Buffer Overflow
- Stack Operations

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• Cryptography Tool: Advanced Encryption Package
• Cryptography Tools
• Public Key Infrastructure (PKI)
• Certification Authorities
• Digital Signature
• SSL (Secure Sockets Layer)
• Transport Layer Security (TLS)
• Disk Encryption
• Disk Encryption Tool: TrueCrypt
• Disk Encryption Tools
• Cryptography Attacks
• Code Breaking Methodologies
• Brute-Force Attack
• Meet-in-the-Middle Attack on Digital Signature Schemes
• Cryptanalysis Tool: CrypTool
• Cryptanalysis Tools
• Online MD5 Decryption Tool

Module 19: Penetration Testing

• Introduction to Penetration Testing
• Security Assessments
• Vulnerability Assessment
• Limitations of Vulnerability Assessment
• Penetration Testing
• Why Penetration Testing?
• What Should be Tested?
• What Makes a Good Penetration Test?
• ROI on Penetration Testing
• Testing Points
• Testing Locations
• Types of Penetration Testing
• External Penetration Testing
• Internal Security Assessment
• Black-box Penetration Testing
• Grey-box Penetration Testing
• White-box Penetration Testing
• Announced / Unannounced Testing
• Automated Testing
• Manual Testing
• Common Penetration Testing Techniques
• Using DNS Domain Name and IP Address Information
• Enumerating Information about Hosts on Publicly-Available Networks

• Phases of Penetration Testing
• Pre-Attack Phase
• Attack Phase
• Activity: Perimeter Testing
• Enumerating Devices
• Activity: Acquiring Target
• Activity: Escalating Privileges
• Activity: Execute, Implant, and Retract
• Post-Attack Phase and Activities
• Penetration Testing Deliverable Templates
• Penetration Testing Methodology
• Application Security Assessment
• Web Application Testing - I
• Web Application Testing - II
• Web Application Testing - III
• Network Security Assessment
• Wireless/Remote Access Assessment
• Wireless Testing
• Telephony Security Assessment
• Social Engineering
• Testing Network-Filtering Devices
• Denial of Service Emulation
• Outsourcing Penetration Testing Services
• Terms of Engagement
• Project Scope
• Pen test Service Level Agreements
• Penetration Testing Consultants
• Evaluating Different Types of Pentest Tools
• Application Security Assessment Tool
• Webscarab
• Network Security Assessment Tool
• Angry IP scanner
• GFI LANguard
• Wireless/Remote Access Assessment Tool
• Kismet
• Telephony Security Assessment Tool
• Omnipoke
• Testing Network-Filtering Device Tool
• Traffic IQ Professional
CCNA/CCENT Certification Bootcamp
Course#: CS101
Exams: 640-822
640-816

Length: 5 Days
Audience: IT Professionals
Type: Certification Bootcamp
Delivery Method: Instructor-led (Classroom)

About this Course
This intense hands-on training course empowers participants with the networking technologies that are required in today’s IT and Telecom environments. In addition to LAN/WAN topics, the course covers routing and network construction and fully prepares participants for the Cisco CCNA/CCENT (Certified Cisco Network Associate/Cisco Certified Networking Technician, 2 separate exams.)

Prerequisites
Network+ or equivalent networking experience in the I.T. industry.

Course Outline

**Module 1: Building a Simple Network (ICND1)**
- Exploring the Functions of Networking
- Securing the Network
- Host-to-Host Communication Model
- TCP/IP’s Internet Layer
- TCP/IP’s Transport Layer
- Packet Delivery Process
- Understanding Ethernet
- Connecting to an Ethernet LAN

**Module 2: Ethernet LANs (ICND1)**
- Challenges of Shared LANs
- Solving Network Challenges with Switched LAN Technology
- Packet Delivery Process
- Operating Cisco IOS Software
- Starting the Switch
- Understanding Switch Security
- Maximizing the Benefits of Switching
- Troubleshooting Switch Issues

**Module 3: Wireless Local Area Networks (WLANS) (ICND1)**
- Exploring Wireless Networking
- Understanding WLAN Security
- Implementing a WLAN

**Module 4: LAN Connections (ICND1)**
- Functions of Routing
- Understanding Binary Basics
- Constructing a Network Addressing Scheme
- Starting a Router
- Configuring a Router
- Packet Delivery Process

**Module 5: Network Environment Management (ICND1)**
- Understanding Router Security
- Using Cisco Router and Security Device Manager
- Using a Router as a DHCP Server
- Accessing Remote Devices

**Module 6: Small Network Implementation (ICND2)**
- Review Lab: Review of a Small Network Environment

**Module 7: Medium-Sized Switched Network Construction (ICND2)**
- Implementing VLANs and Trunks
- Improving Performance with Spanning Tree
- Routing Between VLANs
- Securing the Expanded Network
- Troubleshooting Switched Networks

**Module 8: Wide Area Networks (WANs) (ICND1)**
- WAN Technologies
- Enabling the Internet Connection
- Enabling Static Routing
- Configuring Serial Encapsulation
- Enabling Routing Information Protocol (RIP)

**Module 9: LAN Extension into a WAN (ICND2)**
- Establishing a Point-to-Point WAN Connection with PPP
- Establishing a WAN Connection with Frame Relay
- Troubleshooting Frame Relay WANs
- Introducing VPN Solutions
Module 10: Medium-Sized Routed Network Construction (ICND2)
- Reviewing Routing Operations
- Implementing VLSM

Module 11: Single Area OSPF Implementation (ICND2)
- Implementing OSPF
- Troubleshooting OSPF

Module 12: EIGRP Implementation (ICND2)
- Implementing EIGRP
- Troubleshooting EIGRP

Module 13: Access Control Lists (ACLs) (ICND2)
- Introducing ACL Operation
- Configuring and Troubleshooting ACLs

Module 14: Address Space Management (ICND2)
- Scaling the Network with NAT and PAT
- Transitioning to IPv6
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking.

This primary goal of this course is to help each student pass the exams required to earn the A+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+ certification, students must pass two exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

While both exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure and troubleshoot networking
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
Course Outline

About the Outline
This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components
- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

Section 2: Storage Devices, Power Supplies, and Adapters
- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch

Section 3: Understanding Display Devices
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Section 4: Understanding Laptops and Portable Devices
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Section 5: Installing and Configuring Printers
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
- Printer Interfaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Section 6: Operating System Features and Interfaces
- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What's in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
Section 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
  - Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Section 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
Applying Proper Safety and Disposal Procedures
- Preventing Electrostatic Discharge
- Preventing Electromagnetic Interference
- Working in a Safe Environment
- Handling Equipment
- Following Disposal Procedures

Demonstrating Communication Skills and Professionalism
- Communicating with Customers
  - Using Appropriate Behavior
  - Putting It All in Perspective

Section 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal
  - Computer Components
  - Understanding and Navigating Directory Structures
  - Managing Temporary Files
  - Program Files
  - Understanding and Navigating Directory Structures
  - Managing Temporary Files
  - Program Files
  - Understanding Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Section 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems

Performing Preventive Maintenance
- Performing Scheduled Maintenance
- Using Cleaning Solutions
- Ensuring a Suitable Environment
- Using Recommended Supplies
- Installing Printer Upgrades

Section 16: Operating System Structures and Commands
- Using Operating Systems
  - Using the Command Prompt
  - Understanding and Navigating Directory Structures
- User File Locations
- System File Locations
- Font Files
  - Managing Temporary Files
- Program Files
- Offline Files
  - Windows Vista
  - Windows XP
  - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues
- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.iir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance
- System Performance and Optimization
  - Common Operational Problems
Section 18: Installing and Troubleshooting Networks
- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Section 19: System Security
- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
- Replay Attacks
- Password-Guessing Attacks
- Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
- TCP Attacks
- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools
- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting
- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
- General Rules for the Exam on Access Control
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+, Network+, and Security+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+, Network+, and Security+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ certification and the single exam required for Security+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
Use various network devices
Manage networks
Use network Tools
Understand and implement network security
Manage compliance and operational security
Identify various threats and vulnerabilities
Implement application, data and host security
Manage access control and identity management
Understand and implement cryptography

Prerequisites

Students should be familiar with PC hardware and networking fundamentals.

Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components

Section 2: Storage Devices, Power Supplies, and Adapters

Section 3: Understanding Display Devices

Section 4: Understanding Laptops and Portable Devices

Section 5: Installing and Configuring Printers

Section 6: Operating System Features and Interfaces

Section 7: Installing and Configuring Operating Systems

Section 8: Troubleshooting Theory and Preventive Maintenance

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops

Section 10: Understanding Networking

Section 11: Understanding Network Security Fundamentals

Section 12: Understanding Operational Procedures

Section 13: Installing, Maintaining, and Troubleshooting Hardware

Section 14: Installing, Configuring, and Troubleshooting Laptops

Section 15: Resolving Printer Problems

Section 16: Operating System Structures and Commands

Section 17: Operating System Utilities and Troubleshooting Issues

Section 18: Installing and Troubleshooting Networks

Section 19: System Security

Section 20 Network Technologies

Section 21 Network Media and Topologies

Section 22 Network Devices

Section 23 Network Management

Section 24 Network Tools

Section 25 Network Security

Section 26 Compliance and Operational Security

Section 27 Threats and Vulnerabilities

Section 28 Application, Data and Host Security

Section 29 Access Control and Identity Management

Section 30 Cryptography

Section 31 Cryptography
CompTIA Security+ Bootcamp
Course#: CT104
Exams: SY0-301

About this Course
CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

This primary goal of this course is to help each student pass the exams required to earn the Security+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams
To earn the CompTIA Security+ certification, students must pass exam SY0-301.

Audience Profile
This course is intended for students seeking to earn the CompTIA Security+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion
After completing this course, students will have passed exam SY0-301 required for the CompTIA Security+ certification. In addition, students will be able to:
- Understand and implement network security
- Manage compliance and operational security
- Identify various threats and vulnerabilities
- Implement application, data and host security
- Manage access control and identity management
- Understand and implement cryptography

Prerequisites
Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline
This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Module 1 - Measuring and Weighing Risk
- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
  - Risks Associated with Cloud Computing
  - Risks Associated with Virtualization
- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
  - Business Policies
  - Understanding Control Types, False Positives, and Change and Incident Management

Module 2 - Infrastructure and Connectivity
- Mastering TCP/IP 9
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
Module 4 - Threats and Vulnerabilities

- Understanding Encapsulation
- Working with Protocols and Services
- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements

Understanding Infrastructure Security

- Working with Hardware Components
- Working with Software Components

Understanding the Different Network Infrastructure Devices

- Firewalls
- Hubs
- Modems
- Remote Access Services
- Routers
- Switches
- Load Balancers
- Telecom/PBX Systems
- Virtual Private Networks
- Web Security Gateway
- Spam Filters

Understanding Remote Access

- Using Point-to-Point Protocol
- Working with Tunneling Protocols

Module 3 - Protecting Networks

- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems

Understanding Intrusion Detection Systems

- Working with a Network-Based IDS
- Working with a Host-Based IDS
- Working with NIPS
- Utilizing Honeypots
- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol

Understanding Network Protocols

Module 2 - Access Control and Identity Management

- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider

Understanding Remote Access Connectivity

- Using the Point-to-Point Protocol
- Working with Tunneling Protocols
- Working with RADIUS
- TACACS/TACACS+/XTACACS
- VLAN Management

Understanding Authentication Services

- LDAP
- Kerberos
- Single Sign-On Initiatives

Understanding Access Control

- Mandatory Access Control
- Discretionary Access Control
- Role-Based Access Control
- Rule-Based Access Control

Implementing Access Control Best Practices

- Smart Cards
- Access Control Lists
- Trusted OS
- Secure Router Configuration

Module 6 - Educating and Protecting the User

- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness

- Antivirus Software
- Calculating Attack Strategies
- Understanding Access Attack Types
- Recognizing Modification and Repudiation Attacks
- Identifying Denial-of-Service and Distributed Denial-of-Service Attacks
- Recognizing Botnets

Recognizing Common Attacks

- Backdoor Attacks
- Spoofing Attacks
- Phishing Attacks
- Pharming Attacks
- Phishing and Spear Phishing Attacks
- Man-in-the-Middle Attacks
- Replay Attacks
- Password-Guessing Attacks
- Privilege Escalation

Identifying TCP/IP Security Concerns

- Recognizing TCP/IP Attacks
Module 7 - Operating System and Application Security

- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
  - SQL Injection
  - LDAP Injection
  - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Antimalware
  - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Antimalware
  - Data Loss Prevention
  - Data Encryption
  - Hardware-Based Encryption Devices

Module 8 - Cryptography Basics

- An Overview of Cryptography
  - Understanding Non-mathematical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms
  - Wi-Fi Encryption
- Using Cryptographic Systems
  - Confidentiality
  - Integrity
  - Digital Signatures
  - Authentication
  - Non-repudiation
  - Access Control
  - Key Features
- Understanding Cryptography Standards and Protocols
  - The Origins of Encryption Standards
  - Public-Key Infrastructure X.509/Public-Key Cryptography Standards
  - X.509
  - SSL and TLS
  - Certificate Management Protocols
  - Secure Multipurpose Internet Mail Extensions
  - Secure Electronic Transaction
  - Secure Shell
  - Pretty Good Privacy
  - HTTP Secure
  - Secure HTTP
  - IP Security
  - Tunneling Protocols
  - Federal Information Processing Standard

Module 9 - Cryptography Implementation

- Using Public Key Infrastructure
  - Using a Certificate Authority
  - Working with Registration Authorities and Local Registration Authorities
  - Implementing Certificates
  - Understanding Certificate Revocation
  - Implementing Trust Models
- Preparing for Cryptographic Attacks
  - Ways to Attack Cryptographic Systems
  - Three Types of Cryptographic Attacks
Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys
- Renewing Keys
- Destroying Keys
- Identifying Key Usage

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
- EMI Shielding
  - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
  - Working with 802.1X
  - Flood Guards and Loop Protection
  - Preventing Network Bridging
  - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
  - Wireless Transport Layer Security
- Understanding Mobile Devices
  - Wireless Access Points
  - Extensible Authentication Protocol
  - Lightweight Extensible Authentication Protocol
  - Protected Extensible Authentication Protocol
- Wireless Vulnerabilities to Know

Module 13 - Disaster Recovery and Incident Response
- Understanding Business Continuity
  - Undertaking Business Impact Analysis
  - Utilities
  - High Availability
  - Disaster Recovery
  - Incident Response Policies
  - Understanding Incident Response
  - Succession Planning
- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
  - Mutual Authentication
  - Authentication Protection
- Backup Management
Baseline

Security
● Certificate Management
● Communications Security
  - Preauthentication
  - Remote Control/Remote Shell
  - Virtual Private Networks
● Directory Services Protection
● Disaster Planning
● Documenting Your Environment
● Email Issues
● File-Sharing Basics
● Working with IDSs and Honey Pots
● Incident Handling
● Internet Common Sense
● Key Management Conventions
● Preventing Common Malicious Events
  - Constructing a Line of Defense
  - Types of Attacks
  - Antivirus Protection
  - Making Stronger Passwords
● Managing Personnel
● Keeping Physical Security Meaningful
● Securing the Infrastructure
● Working with Security Zones
● Social Engineering Risks
● System Hardening Basics
● Securing the Wireless Environment
### About this Course

This intense hands-on training course empowers participants with the networking technologies that are required in today’s IT and Telecom environments. In addition to LAN/WAN topics, the course covers routing and network construction and fully prepares participants for the Cisco CCNA/CCENT (Certified Cisco Network Associate/Cisco Certified Networking Technician, 2 separate exams.)

### Prerequisites

Network+ or equivalent networking experience in the I.T. industry.

### Course Outline

#### Module 1: Building a Simple Network (ICND1)
- Exploring the Functions of Networking
- Securing the Network
- Host-to-Host Communication Model
- TCP/IP’s Internet Layer
- TCP/IP’s Transport Layer
- Packet Delivery Process
- Understanding Ethernet
- Connecting to an Ethernet LAN

#### Module 2: Ethernet LANs (ICND1)
- Challenges of Shared LANs
- Solving Network Challenges with Switched LAN Technology
- Packet Delivery Process
- Operating Cisco IOS Software
- Starting the Switch
- Understanding Switch Security
- Maximizing the Benefits of Switching
- Troubleshooting Switch Issues

#### Module 3: Wireless Local Area Networks (WLANS) (ICND1)
- Exploring Wireless Networking
- Understanding WLAN Security
- Implementing a WLAN

#### Module 4: LAN Connections (ICND1)
- Functions of Routing
- Understanding Binary Basics
- Constructing a Network Addressing Scheme
- Starting a Router
- Configuring a Router
- Packet Delivery Process

#### Module 5: Network Environment Management (ICND1)
- Understanding Router Security
- Using Cisco Router and Security Device Manager
- Using a Router as a DHCP Server
- Accessing Remote Devices

#### Module 6: Small Network Implementation (ICND2)
- Review Lab: Review of a Small Network Environment

#### Module 7: Medium-Sized Switched Network Construction (ICND2)
- Implementing VLANs and Trunks
- Improving Performance with Spanning Tree
- Routing Between VLANs
- Securing the Expanded Network
- Troubleshooting Switched Networks

#### Module 8: Wide Area Networks (WANs) (ICND1)
- WAN Technologies
- Enabling the Internet Connection
- Enabling Static Routing
- Configuring Serial Encapsulation
- Enabling Routing Information Protocol (RIP)

#### Module 9: LAN Extension into a WAN (ICND2)
- Establishing a Point-to-Point WAN Connection with PPP
- Establishing a WAN Connection with Frame Relay
- Troubleshooting Frame Relay WANs
- Introducing VPN Solutions
Module 10: Medium-Sized Routed Network Construction (ICND2)
- Reviewing Routing Operations
- Implementing VLSM

Module 11: Single Area OSPF Implementation (ICND2)
- Implementing OSPF
- Troubleshooting OSPF

Module 12: EIGRP Implementation (ICND2)
- Implementing EIGRP
- Troubleshooting EIGRP

Module 13: Access Control Lists (ACLs) (ICND2)
- Introducing ACL Operation
- Configuring and Troubleshooting ACLs

Module 14: Address Space Management (ICND2)
- Scaling the Network with NAT and PAT
- Transitioning to IPv6
The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking.

This primary goal of this course is to help each student pass the exams required to earn the A+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

**Required Exams**

To earn the CompTIA A+ certification, students must pass two exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

While both exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance.

**Audience Profile**

This course is intended for students seeking to earn the CompTIA A+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

**At Course Completion**

After completing this course, students will have passed the two required exams for the CompTIA A+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure and troubleshoot networking
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service

**Prerequisites**

Students should be familiar with pc hardware and networking fundamentals.
About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components

- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

Section 2: Storage Devices, Power Supplies, and Adapters

- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
  - AC Adapters as Power Supplies
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch

Section 3: Understanding Display Devices

- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Section 4: Understanding Laptops and Portable Devices

- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Section 5: Installing and Configuring Printers

- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
  - Printer Interfaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Section 6: Operating System Features and Interfaces

- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What’s in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
Section 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
  - Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Section 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
CT101: CompTIA A+ Bootcamp

COURSE OUTLINE

Applying Proper Safety and Disposal Procedures
- Preventing Electrostatic Discharge
- Preventing Electromagnetic Interference
- Working in a Safe Environment
- Handling Equipment
- Following Disposal Procedures

Demonstrating Communication Skills and Professionalism
- Communicating with Customers
- Using Appropriate Behavior
- Putting It All in Perspective

Section 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal Computer Components
  - Understanding Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Section 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems

Section 16: Operating System Structures and Commands
- Using Operating Systems
  - Using the Command Prompt
  - Understanding and Navigating Directory Structures
- User File Locations
  - System File Locations
  - Font Files
  - Managing Temporary Files
  - Program Files
  - Offline Files
  - Windows Vista
  - Windows XP
  - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues
- Performing Preventive Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.itr Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance
- System Performance and Optimization
  - Common Operational Problems
Section 18: Installing and Troubleshooting Networks

- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Section 19: System Security

- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools
- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting
- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
  - General Rules for the Exam on Access Control

- Replay Attacks
- Password-Guessing Attacks
- Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
- TCP Attacks
The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

**Required Exams**

To earn the CompTIA A+ and Network+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

**Audience Profile**

This course is intended for students seeking to earn the CompTIA A+ and Network+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

**At Course Completion**

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ exam certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
- Use various network devices
- Manage networks
- Use network tools
- Implement network security

**Prerequisites**

Students should be familiar with pc hardware and networking fundamentals.
# Course Outline

## About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

### Section 1: Personal Computer System Components

### Section 2: Storage Devices, Power Supplies, and Adapters

### Section 3: Understanding Display Devices

### Section 4: Understanding Laptops and Portable Devices

### Section 5: Installing and Configuring Printers

### Section 6: Operating System Features and Interfaces

### Section 7: Installing and Configuring Operating Systems

### Section 8: Troubleshooting Theory and Preventive Maintenance

### Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops

### Section 10: Understanding Networking

### Section 11: Understanding Network Security Fundamentals

### Section 12: Understanding Operational Procedures

### Section 13: Installing, Maintaining, and Troubleshooting Hardware

### Section 14: Installing, Configuring, and Troubleshooting Laptops

### Section 15: Resolving Printer Problems

### Section 16: Operating System Structures and Commands

### Section 17: Operating System Utilities and Troubleshooting Issues

### Section 18: Installing and Troubleshooting Networks

### Section 19: System Security

### Section 20 Network Technologies

### Section 21 Network Media and Topologies

### Section 22 Network Devices

### Section 23 Network Management

### Section 24 Network Tools

### Section 25 Network Security
The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+ and Network+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+ and Network+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ exam certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
- Use various network devices
- Manage networks
- Use network tools
- Implement network security

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
# Course Outline

## About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

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About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+, Network+, and Security+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+, Network+, and Security+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ certification and the single exam required for Security+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
● Use various network devices
● Manage networks
● Use network Tools
● Understand and implement network security
● Manage compliance and operational security
● Identify various threats and vulnerabilities
● Implement application, data and host security
● Manage access control and identity management
● Understand and implement cryptography

Prerequisites
Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline
This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components
Section 2: Storage Devices, Power Supplies, and Adapters
Section 3: Understanding Display Devices
Section 4: Understanding Laptops and Portable Devices
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Section 17: Operating System Utilities and Troubleshooting Issues
Section 18: Installing and Troubleshooting Networks
Section 19: System Security
Section 20 Network Technologies
Section 21 Network Media and Topologies
Section 22 Network Devices
Section 23 Network Management
Section 24 Network Tools
Section 25 Network Security
Section 26 Compliance and Operational Security
Section 27 Threats and Vulnerabilities
Section 28 Application, Data and Host Security
Section 29 Access Control and Identity Management
Section 30 Cryptography
Section 31 Cryptography
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

This primary goal of this course is to help each student pass the exams required to earn the Security+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA Security+ certification, students must pass exam SY0-301.

Audience Profile

This course is intended for students seeking to earn the CompTIA Security+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed exam SY0-301 required for the CompTIA Security+ certification. In addition, students will be able to:

- Understand and implement network security
- Manage compliance and operational security
- Identify various threats and vulnerabilities
- Implement application, data and host security
- Manage access control and identity management
- Understand and implement cryptography

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Module 1 - Measuring and Weighing Risk

- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
  - Risks Associated with Cloud Computing
  - Risks Associated with Virtualization

Module 2 - Infrastructure and Connectivity

- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
  - Business Policies
  - Understanding Control Types, False Positives, and Change and Incident Management

- Mastering TCP/IP
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
Module 4 - Threats and Vulnerabilities

- Understanding Software Exploitation
  - Surviving Malicious Code
    - Viruses
    - Trojan Horses
    - Contents
    - Logic Bombs
    - Worms

- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements

Module 3 - Protecting Networks

- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems

- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots

- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol

Module 2 - Understanding Security Awareness and Training

- Antivirus Software
  - Calculating Attack Strategies
    - Understanding Access Attack Types
    - Recognizing Modification and Repudiation Attacks
    - Identifying Denial-of-Service and Distributed Denial-of-Service Attacks
    - Recognizing Botnets

- Recognizing Common Attacks
  - Backdoor Attacks
  - Spoofing Attacks
  - Phishing Attacks
  - Phishing and Spear Phishing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Privilege Escalation

- Identifying TCP/IP Security Concerns
  - Recognizing TCP/IP Attacks

Module 5 - Access Control and Identity Management

- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider

- Understanding Remote Access Connectivity
  - Using the Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Working with RADIUS
  - TACACS/TACACS+/XTACACS
  - VLAN Management

- Understanding Authentication Services
  - LDAP
  - Kerberos
  - Single Sign-On Initiatives

- Understanding Access Control
  - Mandatory Access Control
  - Discretionary Access Control
  - Role-Based Access Control
  - Rule-Based Access Control

- Implementing Access Control Best Practices
  - Smart Cards
  - Access Control Lists
  - Trusted OS
  - Secure Router Configuration

Module 6 - Educating and Protecting the User

- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness
Module 7 - Operating System and Application Security

- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
  - SQL Injection
  - LDAP Injection
  - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Anti-malware
  - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Malware Inspection
  - Data Loss Prevention
  - Data Encryption
- Hardware-Based Encryption Devices

Module 8 - Cryptography Basics

- An Overview of Cryptography
  - Understanding Non-mathematical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms
  - Wi-Fi Encryption
- Using Cryptographic Systems
  - Confidentiality
  - Integrity
  - Digital Signatures
  - Authentication
  - Non-repudiation
  - Access Control
  - Key Features
- Understanding Cryptography Standards and Protocols
  - The Origins of Encryption Standards
  - Public-Key Infrastructure X.509/Public-Key Cryptography Standards
  - X.509
  - SSL and TLS
  - Certificate Management Protocols
  - Secure Multipurpose Internet Mail Extensions
  - Secure Electronic Transaction
  - Secure Shell
  - Pretty Good Privacy
  - HTTP Secure
  - Secure HTTP
  - IP Security
  - Tunneling Protocols
  - Federal Information Processing Standard

Module 9 - Cryptography Implementation

- Using Public Key Infrastructure
  - Using a Certificate Authority
  - Working with Registration Authorities and Local Registration Authorities
  - Implementing Certificates
  - Understanding Certificate Revocation
  - Implementing Trust Models
- Preparing for Cryptographic Attacks
  - Ways to Attack Cryptographic Systems
  - Three Types of Cryptographic Attacks
Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys

Renewing Keys
- Destroying Keys
- Identifying Key Usage

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
- EMI Shielding
  - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
  - Working with 802.1X
- Flood Guards and Loop Protection
  - Preventing Network Bridging
  - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
  - Wireless Transport Layer Security

Module 13 - Disaster Recovery and Incident Response
- Understanding Business Continuity
  - Undertaking Business Impact Analysis
  - Utilities
  - High Availability
  - Disaster Recovery
  - Incident Response Policies
  - Understanding Incident Response
  - Succession Planning
- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
- Mutual Authentication
  - Authentication Protection
- Backup Management
Baselining

Security
Certificate Management
Communications Security
  - Preauthentication
  - Remote Control/Remote Shell
  - Virtual Private Networks
Directory Services Protection
Disaster Planning
Documenting Your Environment
Email Issues
File-Sharing Basics
Working with IDSs and Honey Pots
Incident Handling
Internet Common Sense
Key Management Conventions
Preventing Common Malicious Events
  - Constructing a Line of Defense
  - Types of Attacks
  - Antivirus Protection
  - Making Stronger Passwords
Managing Personnel
Keeping Physical Security Meaningful
Securing the Infrastructure
Working with Security Zones
Social Engineering Risks
System Hardening Basics
Securing the Wireless Environment
About this Course

CompTIA Linux+ Powered by LPI is a high-stakes, vendor-neutral certification that validates the fundamental knowledge and skills required of junior Linux administrators.

The two leading Linux certification bodies, CompTIA and Linux Professional Institute (LPI), have joined forces to release two new Linux+ exams, LX0-101 and LX0-102. This training course breaks down everything you need to prepare for the exams. Covering all exam objectives, the course will teach you Linux command-line tools, managing software, configuring hardware, managing files and file systems, and much more.

Audience Profile

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration, or to prepare for the CompTIA Linux+ Powered by LPI (Exams LX0-01, LX0-102).

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA Linux+ certification: LX0-101 and LX0-102.

In addition, students will be able to:

- Implement Linux command-line tools
- Manage software
- Configure hardware
- Understand boot process and scripts
- Manage files and file systems
- Administer the Windows X system-networking, server and system security

Prerequisites

A CompTIA A+ certification, or the equivalent skills and knowledge, is helpful but not required.

Course Outline

- **Module 1: Exploring Linux Command-Line Tools**
  - Understanding Command-Line Basics Exploring Your Linux Shell Options
  - Using a Shell
  - Exploring Shell Configuration
  - Using Environment Variables
  - Getting Help
  - Using Streams, Redirection, and Pipes
  - Exploring Types of Streams
  - Redirecting Input and Output
  - Piping Data Between Programs
  - Generating Command Lines
  - Processing Text Using Filters
  - File-Combining Commands

- **Module 2: Managing Software**
  - Package Concepts
  - Using RPM
  - RPM Distributions and Conventions
  - The rpm Command Set
Module 3: Configuring Hardware

- Configuring the BIOS and Core Hardware
- Understanding the Role of the BIOS
-IRQs
-I/O Addresses
-DMA Addresses
-Boot Disks and Geometry Settings
-Coldplug and Hotplug Devices
-Configuring Expansion Cards
-Configuring PCI Cards
-Learning about Kernel Modules
-Loading Kernel Modules
-Removing Kernel Modules
-Configuring USB Devices
-USB Basics
-Linux USB Drivers
-USB Manager Applications
-Configuring Hard Disks
-Configuring PATA Disks
-Configuring SATA Disks
-Configuring SCSI Disks
-Configuring External Disks
-Designing a Hard Disk Layout
-Why Partition?
-Understanding Partitioning Systems
-An Alternative to Partitions: LVM
-Mount Points
-Common Partitions and Filesystem Layouts
-Creating Partitions and Filesystems
-Partitioning a Disk
-Preparing a Partition for Use
-Maintaining Filesystem Health
-Tuning Filesystems
-Maintaining a Journal
-Checking Filesystems
-Monitoring Disk Use
-Mounting and Unmounting Filesystems
-Temporarily Mounting or Unmounting Filesystems
-Permanently Mounting Filesystems

Module 4: Managing Files

- Managing Files
-File Naming and Wildcard Expansion Rules
-File Commands
-File Archiving Commands
-Managing Links
-Directory Commands
-Managing File Ownership
-Assessing File Ownership
-Changing a File’s Owner
-Changing a File’s Group
-Controlling Access to Files
-Understanding Permissions
-Changing a File’s Mode
-Setting the Default Mode and Group
-Changing File Attributes
-Managing Disk Quotas
-Enabling Quota Support
-Setting Quotas for Users
-Locating Files
-The FHS
-Tools for Locating Files

Module 5: Booting Linux and Editing Files

- Installing Boot Loaders
-Boot Loader Principles
-Using LILO as the Boot Loader
-Using GRUB as the Boot Loader
-Understanding the Boot Process
-Extracting Information about the Boot Process
-Locating and Interpreting Boot Messages
-The Boot Process
Module 6: Configuring the X Window System
- Localization, and Printing
- Configuring Basic X Features
- X Server Options for Linux
- Methods of Configuring X
- X Configuration Options
- Obtaining X Display Information
- Configuring X Fonts
- Font Technologies and Formats
- Configuring X Core Fonts
- Configuring a Font Server
- Configuring Xf Fonts
- Managing GUI Logins
- The X GUI Login System
- Running an XDMCP Server
- Configuring an XDMCP Server
- Using X for Remote Access
- X Client/Server Principles
- Using Remote X Clients
- X Accessibility
- Keyboard and Mouse Accessibility Issues
- Screen Display Settings
- Using Additional Assistive Technologies
- Configuring Localization and Internationalization
- Setting Your Time Zone
- Querying and Setting Your Locale
- Configuring Printing
- Conceptualizing the Linux Printing Architecture
- Understanding PostScript and Ghostscript
- Running a Printing System
- Configuring CUPS
- Monitoring and Controlling the Print Queue

Module 7: Administering the System
- Managing Users and Groups
- Understanding Users and Groups
- Configuring User Accounts
- Configuring Groups
- Tuning User and System Environments
- Using System Log Files
- Understanding syslogd

Module 8: Configuring Basic Networking
- Understanding TCP/IP Networking
- Knowing the Basic Functions of Network Hardware
- Investigating Types of Network Hardware
- Understanding Network Packets
- Understanding Network Protocol Stacks
- Knowing TCP/IP Protocol Types
- Understanding Network Addressing
- Using Network Addresses
- Resolving Hostnames
- Network Ports
- Configuring Linux for a Local Network
- Network Hardware Configuration
- Configuring with DHCP
- Configuring with a Static IP Address
- Configuring Routing
- Using GUI Configuration Tools
- Using the ifup and ifdown Commands
- Configuring Hostnames
- Diagnosing Network Connections
- Testing Basic Connectivity
- Tracing a Route
- Checking Network Status
- Examining Raw Network Traffic
- Using Additional Tools

Module 9: Writing Scripts, Configuring E-mail, and Using Databases
- Managing the Shell Environment
- Reviewing Environment Variables
- Understanding Common Environment Variables
- Using Aliases
- Modifying Shell Configuration Files
- Writing Scripts
- Beginning a Shell Script
- Using Commands
CT105: CompTIA Linux+ Bootcamp

Module 10: Securing Your System
- Administering Network Security
- Using Super Server Restrictions
- Disabling Unused Servers
- Administering Local Security
- Securing Passwords
- Limiting root Access
- Setting Login, Process, and Memory Limits
- Locating SUID/SGID Files
- Configuring SSH
- SSH Basics
- Setting SSH Options for Your System
- SSH Security Considerations
- Using GPG
- Generating and Importing Keys
- Encrypting and Decrypting Data
- Signing Messages and Verifying Signatures

- Using Variables
- Using Conditional Expressions
- Using Loops
- Using Functions
- Managing E-mail
- Understanding E-mail
- Choosing E-mail Software
- Managing E-mail
- Securing Your E-mail Server
- Managing Data with SQL
- Picking a SQL Package
- Understanding SQL Basics
- Using MySQL
About this Course

The CompTIA Server+ certification is an international vendor neutral credential that validates skills and knowledge needed to build and support server hardware.

The primary goal of this course is to help each student pass the exams required to earn the Server + certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA Server + certification, students must pass exam SK0-003.

Audience Profile

This course is intended for students seeking to earn the CompTIA Server+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. Students will be able to:

- Identify environmental issues
- Understand and comply with disaster recovery and physical / software security procedures
- Be familiar with industry terminology and concepts
- Understand server roles / specializations and interaction within the overall computing environment.

Prerequisites

The CompTIA Server+ certification is targeted towards individuals with 18-24 months of IT experience. Although not a prerequisite, it is recommended that CompTIA Server+ candidates hold a CompTIA A+ certification.

Course Outline

1.0 System Hardware

1.1 Differentiate between system board types, features, components and their purposes.
- Dip switches / jumpers
- Processor (single and multi)
- Bus types and bus speeds
- On board components
- Expansion slots
- BIOS
- Riser Card / backplane
- Storage connectors

1.2 Deploy different chassis types and the appropriate components
- Cooling
- Form Factor (tower, rack, blade)
- Power
- Redundant power
- Shut off switches – chassis intrusion
- Power buttons
- Reset buttons
- Diagnostic LEDs
- Expansion bays
1.3 Differentiate between memory features / types and given a scenario select appropriate memory

- Memory pairing
- ECC vs. non ECC
- Registered vs. non-registered
- RAID and hot spares
- Types
- Memory compatibility
- On board vs. riser card

1.4 Explain the importance of a Hardware Compatibility List (HCL)

- Vendor standards for hardware
- Memory and processor compatibility
- Expansion cards compatibility
- Virtualization requirements

1.5 Differentiate between processor features / types and given a scenario select the appropriate processor

- Multicore
- Multiprocessor
- Cache levels
- Stepping
- Speed
- VRMs
- Execute disable (XD) or not execute (NX)
- Hyper-Threading
- VT or AMD-V
- AMD vs. Intel (non-compatible CPUs)
- Processor architecture (RISC, CISC)
- Vendor slot types
- 64bit vs. 32 bit
- Heat dissipation (heat sinks, fans, liquid cooling)

1.6 Given a scenario, install appropriate expansion cards into a server while taking fault tolerance into consideration.

- Manufacturer specific
- HBAs
- NICs
- Video
- Audio
- Storage controller (SCSI, SATA, RAID)
- Port expansion cards

1.7 Install, update and configure appropriate firmware.

- Driver / hardware compatibility
- Implications of a failed firmware upgrade (redundant BIOS)
- Follow manufacturer instructions and documentation

2.1 Install, deploy, configure and update NOS (Windows / *nix).

- Installation methods (optical media, USB, network share, PXE) virtualization templates
- Bootloader
- File systems
- Driver installation
- Configure NOS
- Patch management

2.2 Explain NOS security software and its features.

- Software firewall
- Malware protection software
- Basics of file level permissions vs. share permissions

2.3 Given a scenario, implement and administer NOS management features based on procedures and guidelines

- User management
- Resource management
- Monitoring (tools and agents)

2.4 Explain different server roles, their purpose and how they interact

- File and print server
- Database server
- Web server
- Messaging server
- DHCP server
- Directory services server
- DNS server
- Application server
- Remote access server
- Virtualized services
- NTP server
- Explain the different between a workstation, desktop and a server
- Server shut down and start up sequence (one server vs. multiple servers vs. attached components)

2.5 Summarize server virtualization concepts, features and considerations

- Resource utilization
- Configuration
- Interconnectivity
- Management server
- Reasons for virtualization

2.6 Describe common elements of networking essentials

- TCP/IP
- Ethernet
- VPN
- VLAN
- DMZ
### 3.0 Storage

#### 3.1 Describe RAID technologies and its features and benefits
- Hot spare
- Software vs. hardware
- Cache read/write levels (data loss potential)
- Performance benefits and tradeoffs

#### 3.2 Given a scenario, select the appropriate RAID level
- 0, 1, 3, 5, 6, 10, 50
- Performance benefits and tradeoffs

#### 3.3 Install and configure different internal storage technologies
- Hot swappable vs. non-hot swappable
- SCSI, Ultra SCSI, Ultra320 (termination), LUNs
- SAS, SATA
- Tape
- Optical
- Flash
- Floppy (USB)
- Controller (firmware levels)
- Hard drive (firmware, JBOD)

#### 3.4 Summarize the purpose of external storage technologies
- Network attached storage
- Storage area network
- Tape library
- WORM
- Optical jukebox
- Transport media

### 4.0 IT Environment

#### 4.1 Write, utilize and maintain documentation, diagrams and procedures
- Follow pre-installation plan when building or upgrading servers
- Labeling
- Diagram server racks and environment topologies
- Hardware and software upgrade, installation, configuration, server role and repair logs
- Document server baseline (before and after service)
- Original hardware configuration, service tags, asset management and warranty
- Vendor specific documentation

#### 4.2 Given a scenario, explain the purpose of the following industry best practices
- Follow vendor specific server best practices
- Explore ramifications before implementing change – determine organizational impact
- Communicate with stakeholders before taking action and upon completion of action
- Comply with all local laws / regulations, industry and corporate regulations

### 4.3 Determine an appropriate physical environment for the server location
- Check for adequate and dedicated power, proper amperage and voltage communication and shut down, proper monitoring
- Server cooling considerations – HVAC

### 4.4 Implement and configure different methods of server access
- KVM (local and IP based)
- Direct connect

### 4.5 Given a scenario, classify physical security measures for a server location
- Physical server security
- Access control devices (RFID, keypads, pinpads)
- Security procedures
- Defense in-depth – multiple layers of defense
- Reasons for physical security
- Secure documentation related to servers

### 5.0 Disaster Recovery

#### 5.1 Compare and contrast backup and restoration methodologies, media types and concepts
- Methodologies (full, incremental, differential, selective)
- Media types
- Backup security and off-site storage
- Importance of testing the backup and restoration process

#### 5.2 Given a scenario, compare and contrast the different types of replication methods
- Disk to disk
- Server to server
- Site to site
- Site types

#### 5.3 Explain data retention and destruction concepts
- Awareness of potential legal requirements
- Awareness of potential company policy requirements
- Differentiate between archiving and backup

#### 5.4 Given a scenario, carry out the following basic steps of a disaster recovery plan
- Disaster recovery testing process
- Follow emergency procedures (people first)
- Use appropriate fire suppressants
- Follow appropriate fire suppressants
- Classification of systems (prioritization during recovery)
6.0 Troubleshooting

6.1 Explain troubleshooting theory and methodologies
- Identify the problem and determine the scope environment
- Establish a theory of probable cause (question the obvious) multiple problems
- Test the theory to determine cause
- Establish a plan of action to resolve the problem and notify impacted users
- Implement the solution or escalate as appropriate resolved the problem
- Implement new change
- Verify full system functionality and if applicable implement preventative measures
- Perform a root cause analysis
- Document findings, actions and outcomes throughout the process

6.2 Given a scenario, effectively troubleshoot hardware problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Environmental issues
- Hardware tools

6.3 Given a scenario, effectively troubleshoot software problems, selecting the appropriate tools and methods
- Common problems
- Cause of common problems
- Software tools

6.4 Given a scenario, effectively diagnose network problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Networking tools

6.5 Given a scenario, effectively troubleshoot storage problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Storage tools
Comprehensive Computer Repair Training

Course#: CTIA-1101
Exams: 220-801, 220-802

Length: 10 days
Audience: IT Professionals
Type: Course
Delivery Method: Instructor-led (classroom)

About this Course

Launch your IT career with CompTIA's popular A+ certification. One of our most demanded courses, this hands-on course teaches you to build, troubleshoot, and repair computers. Our certified instructors guide you through each topic, teaching you essential concepts through hands-on exercises and demonstrations. As you prepare to take the two required certification exams, our instructors serve as an invaluable exam-preparation resource by answering any questions and providing you with practice tests, flash cards, and more.

Audience Profile

More than 700,000 people worldwide have become CompTIA A+ certified since the program’s inception in 1993. Many companies, including CompuCom and Ricoh, have made CompTIA A+ certification mandatory for their service technicians.

Earning the CompTIA A+ certification also opens doors to many IT career possibilities. CompTIA A+ is part of the certification track for vendors such as Microsoft, Hewlett-Packard, Cisco and Novell allowing you go on to become a systems administrator, systems engineer, or more.

At Course Completion

After completing this course, students will be able to demonstrate knowledge and skills in the following areas:

- Personal Computer System Components
- Storage Devices, Power Supplies, and Adapters
- Understanding Display Devices
- Understanding Laptops and Portable Devices
- Installing and Configuring Printers
- Operating System Features and Interfaces
- Installing and Configuring Operating Systems
- Troubleshooting Theory and Preventive Maintenance
- Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Understanding Networking
- Understanding Network Security Fundamentals
- Understanding Operational Procedures
- Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Troubleshooting Laptops
- Resolving Printer Problems
- Operating System Structures and Commands
- Operating System Utilities and Troubleshooting Issues
- Installing and Troubleshooting Networks
- System Security

Prerequisites

There are no prerequisites for attending the course.
## Course Outline

### Section 1: Personal Computer System Components
- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

### Section 2: Storage Devices, Power Supplies, and Adapters
- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
  - AC Adapters as Power Supplies
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch
- Identifying Purposes and Characteristics of Adapter Cards
  - Video
  - Multimedia
  - I/O
  - Communications

### Section 3: Understanding Display Devices
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

### Section 4: Understanding Laptops and Portable Devices
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

### Section 5: Installing and Configuring Printers
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
- Printer Interlaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

### Section 6: Operating System Features and Interfaces
- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What’s in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
  - The Registry
  - Virtual Memory
  - Windows System Files
  - Disc Management
  - File Management
Section 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
  - Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops
- Section 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
- Applying Proper Safety and Disposal Procedures
  - Preventing Electrostatic Discharge
  - Preventing Electrostatic Interference
  - Working in a Safe Environment
  - Handling Equipment
  - Following Disposal Procedures
Demonstrating Communication Skills and Professionalism
- Communicating with Customers
  - Using Appropriate Behavior
  - Putting It All in Perspective

Section 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal Computer Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems
- Performing Preventive Maintenance
  - Performing Scheduled Maintenance
  - Using Cleaning Solutions
  - Ensuring a Suitable Environment
  - Using Recommended Supplies
  - Installing Printer Upgrades

Section 16: Operating System Structures and Commands
- Using Operating Systems
  - Using the Command Prompt
  - Understanding and Navigating Directory Structures
  - User File Locations
  - System File Locations
  - Font Files
    - Managing Temporary Files
  - Program Files
  - Offline Files
    - Windows Vista
    - Windows XP
    - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues
- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.it Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities
  - Disk Management Tools
  - Disk and Remote Management
    - Getting Disks Ready to Store Files and Programs
    - Remote Desktop Connection and Assistance
  - System Performance and Optimization
    - Common Operational Problems

Section 18: Installing and Troubleshooting Networks
- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Section 19: System Security
- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
  - TCP Attacks

Recovering Operating Systems
- Recovery Console
- Recovery CD/DVD
- Automated System Recovery
- Emergency Repair Disk
- Diagnostic Tools

Security and Troubleshooting
- Hardening the OS
- Updating Your Operating System
- Working with File systems
- General Rules for Security and Troubleshooting

Access Control
- Working with Policies
- Working with Disks and Directories
- Auditing and Logging
- BIOS Security
- Encrypting File System
- General Rules for the Exam on Access Control
CompTIA Network+ Certification Course

Course#: CTIA-1102  
Exams: N10-005

Length: 5 days  
Audience: IT Professionals  
Technology: Computer Networks  
Type: Course  
Delivery Method: Instructor-Led Classroom

About this Course

Kick-start your IT career with CompTIA’s A+ and Network+ certifications. We’ve combined these two popular courses into one course so that you can learn to build, troubleshoot, and repair computers and networks in the shortest possible time.

The CompTIA A+ certification is the industry standard for computer support technicians. The international, vendor-neutral certification proves competence in areas such as installation, preventative maintenance, networking, security and troubleshooting.

The CompTIA Network+ certification is the sign of a competent networking professional. It is an international, vendor-neutral certification that proves a technician’s competency in managing, maintaining, troubleshooting, installing and configuring basic network infrastructure.

Audience Profile

This course is recommended for students wanting to start a career in computer networking.

At Course Completion

After completing this course, students will be able to:

- Build computers
- Troubleshoot and repair computers
- Installation hardware
- Conduct preventative maintenance
- Troubleshoot and configure networking
- Recognize security risks
- Identify and use networking hardware and components
- Identify and use networking media and connectors
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- Identify and use networking media and connectors

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1: Personal Computer System Components

- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans

Module 2: Storage Devices, Power Supplies, and Adapters

- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
Module 3: Understanding Display Devices
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Module 4: Understanding Laptops and Portable Devices
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Module 5: Installing and Configuring Printers
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
  - Printer Interlaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Module 6: Operating System Features and Interfaces
- Understanding Operating Systems

Module 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
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  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
  - Performing a Repair Install
  - Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
  - Identifying Boot Sequences

Module 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
CTIA-1102: CompTIA Network+ Certification Course

Module 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
- Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Module 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Module 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Module 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards

Module 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal Computer Components
  - Computer Components
  - Understand i iig Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Module 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Module 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems

CTIA
- Applying Proper Safety and Disposal Procedures
  - Preventing Electrostatic Discharge
  - Preventing Electromagnetic Interference
  - Working in a Safe Environment
  - Handling Equipment
  - Following Disposal Procedures
- Demonstrating Communication Skills and Professionalism
  - Communicating with Customers
  - Using Appropriate Behavior
  - Putting It All in Perspective

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Module 12: Understanding Operational Procedures
- Managing the Physical Environment
- Using the Right Repair Tools and Cleaning Materials
- Running Updates
- Using Disk Management Tools
- Backing Up Data and Creating Restore Points

Module 11: Understanding Network Security Fundamentals
- Identifying Environmental Concerns
- Using Safety Documentation
- Using Appropriate Repair Tools
- Handling Accidents

Module 10: Understanding Networking Principles
- Understanding Operating System and Hardware Symptoms
- Troubleshooting Common Operating System Problems
- Troubleshooting Hardware Symptoms
- Troubleshooting Printers
- Troubleshooting Common Laptop Issues
- Diagnosing Laptop Problems
- Preventive Maintenance on Laptops

Module 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
- Understanding Operating System and Hardware Symptoms
- Troubleshooting Common Operating System Problems
- Troubleshooting Hardware Symptoms
- Troubleshooting Printers
- Troubleshooting Common Laptop Issues
- Diagnosing Laptop Problems
- Preventive Maintenance on Laptops

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Performing Preventive Maintenance
  - Performing Scheduled Maintenance
  - Using Cleaning Solutions
  - Ensuring a Suitable Environment
  - Using Recommended Supplies
  - Installing Printer Upgrades

Module 16: Operating System Structures and Commands
- Using Operating Systems
  - Using the Command Prompt
- Understanding and Navigating Directory Structures
- User File Locations
- System File Locations
- Font Files
  - Managing Temporary Files
- Program Files
- Offline Files
  - Windows Vista
  - Windows XP
  - Windows 2000

Module 17: Operating System Utilities and Troubleshooting Issues
- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.ir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance
- System Performance and Optimization
  - Common Operational Problems

Module 18: Installing and Troubleshooting Networks
- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Module 19: System Security
- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
  - TCP Attacks
- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools
- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting
- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
  - General Rules for the Exam on Access Control

Module 20: Introduction to Networks
- First Things First: What's a Network?
  - The Local Area Network (LAN)
- Common Network Components
  - Virtual LANs (VLANs)
  - Wide Area Network (WAN)
Module 23: The Current Ethernet Specifications
- Network Basics
- Ethernet Basics
  - Collision Domain
  - Broadcast Domain
  - CSMA/CD
  - Half- and Full-Duplex Ethernet
- Ethernet at the Data Link Layer
  - Binary to Decimal and Hexadecimal Conversion
  - Ethernet Addressing
  - Ethernet Frames
  - Channel Bonding
- Ethernet at the Physical Layer

Module 24: Networking Devices
- Common Network Connectivity Devices
  - Hub
  - Repeater
  - Modem
  - Network Interface Card (NIC)
  - Transceiver (Media Converter)
  - Bridge
  - Switch
  - Wireless Access Point (AP)
  - Firewall
  - Dynamic Host Configuration Protocol (DHCP) Server
- Other Specialized Devices
  - Multilayer Switch
  - Content Switch
  - Intrusion Detection or Prevention System (IDS/IPS)
  - Load Balancer
  - Multifunction Network Devices
  - Domain Name Service (DNS) Server
  - Bandwidth Shaper
  - Proxy Server
  - Channel Service Unit/Data Service Unit (CSU/DSU)

Module 25: Introduction to Internet Protocol (IP)
- Introducing TCP/IP
  - A brief History of TCP/IP
  - TCP/IP and the DoD Model
  - The Process/Application Layer Protocol
  - The Host-to-Host Layer Protocol
  - The Internet Layer Protocol
- Data Encapsulation

Module 26: IP Addressing
- IP Terminology
  - The Hierarchical IP Addressing Scheme
-
Network Addressing
  - Private IP Addressing
  - Broadcast Addressing
  - Internet Protocol Version 6 (IPv6)
    - Why Do We Need IPv6?
    - The Benefit of and Uses for IPv6
    - IPv6 Addressing and Expressions
    - Shortened Expression
    - Address Types
    - Special Addresses

Module 27: IP Subnetting, Troubleshooting IP, and Introduction to NAT
  - Subnetting Basics
    - How to Create Subnets
    - Subnet Masks
    - Classless Inter-Domain Routing (CIDR)
    - Subnetting Class C Addresses
    - Subnetting Class B Addresses
  - Troubleshooting IP Addressing
    - Determining IP Address Problems
  - Introduction to Network Address Translation (NAT)
    - Types of Network Address Translation
    - NAT Names
    - How NAT Works

Module 28: Introduction to IP Routing
  - Routing Basics
  - The IP Routing Process
  - Testing Your IP Routing Understanding
  - Static and Dynamic Routing

Module 29: Routing Protocols
  - Routing Protocol Basics
    - Administrative Distances
    - Classes of Routing Protocols
  - Distance-Vector Routing Protocols
    - Routing Information Protocol (RIP)
      - RIP Version 2 (RIPv2)
    - VLSM and Discontiguous Networks
    - EIGRP
    - Border Gateway Protocol (BGP)
  - Link-State Routing Protocol
    - Open Shortest Path First (OSPF)
    - Intermediate System to Intermediate System (IS-IS)
  - IPv6 Routing Protocols
    - RIPvng
    - EIGRPv6
    - OSPFv3

Module 30: Switching and Virtual LANs (VLANS)
  - Networking Before Layer 2 Switching

Module 31: Wireless Technologies
  - Introduction to Wireless Technology
  - The 802.11 Standards
    - 2.4GHz (802.11b)
    - 2.4GHz (802.11g)
    - 5GHz (802.11a)
    - 5GHz (802.11n)
    - 2.4GHz/5GHz 802.11n
  - Comparing 802.11 Standards
    - Wireless LAN Modulation Techniques
    - Range Comparisons
  - Wireless Network Components
    - Wireless Access Points
    - Wireless Network Interface Card (NIC)
    - Wireless Antennas
  - Installing a Wireless Network
    - Ad hoc Mode: Independent Basic Service Set (IBSS)
    - Infrastructure Mode: Basic Service Set (BSS)
    - Design Considerations with Large Wireless Networks
    - Installing and Configuring Hardware
  - Wireless Security
    - Open Access
    - Service Set Identifiers (SSIDs), Wired Equivalent Privacy (WEP), and Media Access Control (MAC) Address Authentication
    - Remote Authentication Dial In User Service (RADIUS)
    - Temporal Key Integrity Protocol (TKIP)
    - Wi-Fi Protected Access (WPA) or WPA 2 Pre-Shared Key

Module 32: Authentication and Access Control
  - Security Filtering
    - Access Control Lists
Module 33: Network Threats and Mitigation

- Recognizing Security Threats
  - Denial of Service (DoS)
  - Worms
  - Attackers and Their Tools
  - Rogue Access Points
  - Social Engineering Phishing

- Understanding Mitigation Techniques
  - Active Detection
  - Passive Detection
  - Proactive Defense

- Policies and Procedures
  - Security Policies
  - Security Training
  - Patches and Upgrades
  - Updating Antivirus Components
  - Fixing an Infected Computer

Module 34: Physical and Hardware Security

- Using Hardware and Software Security Devices
  - Defining Firewalls
    - Network-Based Firewalls
    - Host-Based Firewalls

- Firewall Technologies
  - Access Control List (ACL)
  - Demilitarized Zone (DMZ)
  - Protocol Switching
  - Dynamic Packet Filtering
  - Proxy Services

- Firewalls at the Application Layer vs. the Network Layer
  - Stateful vs. Stateless Network-Layer Firewalls
  - Application-layer Firewalls

- Scanning Services and Other Firewall Features
  - Content Filtering
  - Signature Identification
  - Zones

Module 35: Wide Area Networks

- What's a WAN?
  - Defining WAN Terms
  - The Public Switched Telephone Network (PSTN)
  - WAN Connection Types
  - Bandwidth or Speed

- T-Series Connections
  - The T1 Connection
  - The T3 Connection

- Transmission Media
  - Wired Connections
  - Wireless Technologies

- Broadband Services
  - DSL Technology and xDSL
  - Cable Modem

- WAN Protocols
  - Integrated Services Digital Network (ISDN)
  - Frame Relay Technology
  - Asynchronous Transfer Mode (ATM)
  - Multi Protocol Label Switching (MPLS)

Module 36: Command-Line Tools

- Using traceroute
- Using ipconfig and ifconfig
  - Using the ipconfig Utility
  - Using the ifconfig Utility

- Using the ping Utility

- Using the Address Resolution Protocol (ARP)
  - The Windows ARP Table

- Using the arp Utility
- Using the nslookup Utility

- Resolving Names with the Hosts Table
  - Using the mtr Command
  - Using the route Command
  - Using the route Command Options

- Some Examples of the route Command
  - Using the nbstat Utility
    - The -a Switch
    - The -A Switch
    - The -c Switch
    - The -n Switch
    - The -r Switch
Module 37: Software and Hardware Tools
- Understanding Network Scanners
  - Packet Sniffers
  - Intrusion Detection and Prevention Software (IDS/IPS)
- Identifying Hardware Tools
  - Cable Tester
  - Protocol Analyzer
  - Certifiers
  - Time-Domain Reflectometer (TDR)
  - Optical Time-Domain Reflectometer (OTDR)
  - Multimeter
  - Toner Probe
  - Butt Set
  - Punch-Down Tool
  - Cable Stripper/Snips
  - Voltage Event Recorder
  - Temperature Monitor

Module 38: Network Troubleshooting
- Narrowing Down the Problem
  - Are There Any Cabling Issues? Did You Check the Super Simple Stuff?
  - Is Hardware or Software Causing the Problem?
  - Is it a Workstation or a Server Problem?
  - Which Segments of the Network Are Affected?
  - Is It Bad Cabling?
- Troubleshooting Steps
  - Step 1: Information Gathering - Identify Symptoms and Problems
  - Step 2: Identify the Affected Areas of the Network
  - Step 3: Determine if Anything Has Changed
  - Step 4: Establish the Most Probable Cause
  - Step 5: Determine if Escalation Is Necessary
  - Step 6: Create an Action Plan and Solution, Identifying Potential Effects
  - Step 7: Implement and Test the Solution
  - Step 8: Identify the Results and Effects of the Solution
  - Step 9: Document the Solution and the Entire Process
- Troubleshooting Tips
  - Don't Overlook the Small Stuff
  - Prioritize Your Problems
  - Check the Software Configuration
  - Don't Overlook Physical Conditions
  - Don't Overlook Cable Problems
  - Check for Viruses

Module 39: Management, Monitoring, and Optimization
- Managing Network Documentation
  - Schematics and Diagrams
  - Baselines
  - Policies, Procedures, and Regulations
- Monitoring the Network and Optimizing Its Performance
  - Network Monitor.ng and Logging
  - Reasons to Optimize Your Network’s Performance
  - How to Optimize Performance
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

Because human error is the number one cause for a network security breach, CompTIA Security+ is recognized by the technology community as a valuable credential that proves competency with information security. Many corporations recommend or require the Security+ certification for their IT employees. Network security is a major issue for corporations today and as the demand for secure networks grows, Security+ is quickly becoming the standard. CompTIA Security+ is the perfect addition to any networking career.

Audience Profile

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At Course Completion

After completing this course, students will be able to:

- Identify and help mitigate security risks—essential concepts
- Know and apply the basic principles of cryptography, keys, and certificates
- Monitor and help secure vulnerabilities in TCP/IP and network infrastructure
- Help protect e-mail, RAS, VPNs, wireless services, and other online communications
- Configure user and group privileges, access control, and authentication
- Implement security baselines, system updates, and intrusion detection
- Create an operational security plan—from physical security to business continuity
- Build an organizational security program—documentation, risk assessment

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1 - Measuring and Weighing Risk

- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
- Risks Associated with Cloud Computing
- Risks Associated with Virtualization

Module 2 - Infrastructure and Connectivity

- Business Policies
- Understanding Control Types, False Positives, and Change and Incident Management

- Mastering TCP/IP
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
  - Understanding Encapsulation
  - Working with Protocols and Services
Module 3 - Protecting Networks

- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems
- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots
- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol
- Understanding Network Protocols

Module 4 - Threats and Vulnerabilities

- Understanding Software Exploitation
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements
- Understanding Infrastructure Security
  - Working with Hardware Components
  - Working with Software Components
- Understanding the Different Network Infrastructure Devices
  - Firewalls
  - Hubs
  - Modems
  - Remote Access Services
  - Routers
  - Switches
  - Load Balancers
  - Telecom/PBX Systems
  - Virtual Private Networks
  - Web Security Gateway
  - Spam Filters
- Understanding Remote Access
  - Using Point-to-Point Protocol
  - Working with Tunneling Protocols

Module 5 - Access Control and Identity Management

- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider
- Understanding Remote Access Connectivity
  - Using the Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Working with RADIUS
  - TACACS/TACACS+/XTACACS
  - VLAN Management
- Understanding Authentication Services
  - LDAP
  - Kerberos
  - Single Sign-On Initiatives
- Understanding Access Control
  - Mandatory Access Control
  - Discretionary Access Control
  - Role-Based Access Control
  - Rule-Based Access Control
- Implementing Access Control Best Practices
  - Smart Cards
  - Access Control Lists
  - Trusted OS
  - Secure Router Configuration

Module 6 - Educating and Protecting the User

- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness
  - Providing Education and Training
  - Training Topics
Module 7 - Operating System and Application Security

- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
    - SQL Injection
    - LDAP Injection
    - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Antimalware
  - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Malware Inspection
  - Data Loss Prevention
  - Data Encryption
  - Hardware-Based Encryption Devices

Module 8 - Cryptography Basics

- An Overview of Cryptography
  - Understanding Non-mathematical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms
  - Wi-Fi Encryption
- Using Cryptographic Systems
  - Confidentiality
  - Integrity
  - Digital Signatures
  - Authentication
  - Non-repudiation
  - Access Control
  - Key Features
- Understanding Cryptography Standards and Protocols
  - The Origins of Encryption Standards
  - Public-Key Infrastructure X.509/Public-Key Cryptography Standards
    - X.509
    - SSL and TLS
    - Certificate Management Protocols
    - Secure Multipurpose Internet Mail Extensions
    - Secure Electronic Transaction
    - Secure Shell
    - Pretty Good Privacy
    - HTTP Secure
    - Secure HTTP
    - IP Security
    - Tunneling Protocols
    - Federal Information Processing Standard

Module 9 - Cryptography Implementation

- Using Public Key Infrastructure
  - Using a Certificate Authority
  - Working with Registration Authorities and Local Registration Authorities
  - Implementing Certificates
  - Understanding Certificate Revocation
  - Implementing Trust Models
- Preparing for Cryptographic Attacks
  - Ways to Attack Cryptographic Systems
  - Three Types of Cryptographic Attacks
Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys
- Renewing Keys
- Destroying Keys
- Identifying Key Usage

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
  - EMI Shielding
    - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
    - Working with 802.1X
  - Flood Guards and Loop Protection
  - Preventing Network Bridging
  - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
- Wireless Transport Layer Security

Module 13 - Disaster Recovery and Incident Response
- Understanding Business Continuity
  - Undertaking Business Impact Analysis
  - Utilities
  - High Availability
  - Disaster Recovery
  - Incident Response Policies
  - Understanding Incident Response
  - Succession Planning
- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
- Mutual Authentication
- Authentication Protection
- Backup Management
Baselining

Security
• Certificate Management
• Communications Security
  • Preauthentication
  • Remote Control/Remote Shell
  • Virtual Private Networks
• Directory Services Protection
• Disaster Planning
• Documenting Your Environment
• Email Issues
• File-Sharing Basics
• Working with IDSs and Honey Pots
• Incident Handling
• Internet Common Sense
• Key Management Conventions
• Preventing Common Malicious Events
  • Constructing a Line of Defense
  • Types of Attacks
  • Antivirus Protection
  • Making Stronger Passwords
• Managing Personnel
• Keeping Physical Security Meaningful
• Securing the Infrastructure
• Working with Security Zones
• Social Engineering Risks
• System Hardening Basics
• Securing the Wireless Environment
About this Course

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- Monitor and help secure vulnerabilities in TCP/IP and network infrastructure
- Help protect e-mail, RAS, VPNs, wireless services, and other online communications
- Configure user and group privileges, access control, and authentication
- Implement security baselines, system updates, and intrusion detection
- Create an operational security plan—from physical security to business continuity
- Build an organizational security program—documentation, risk assessment

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1: General Security Concepts

- Understanding Information Security
  - Securing the Physical Environment
  - Examining Operational Security
  - Working with Management and Policies
- Understanding the Goals of Information Security
- Comprehending the Security Process
  - Appreciating Antivirus Software
  - Implementing Access Control
  - Understanding Authentication

Module 2: Identifying Potential Risks

- Authentication issues to Consider
- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Addressing Business Concerns
  - Dealing with Telephony Issues
- Calculating Attack Strategies
  - Understanding Access Attack Types
Module 1: Understanding Security Concepts
- Recognizing Modification and Repudiation Attacks
- Identifying Denial-of-Service and Distributed
- Denial-of-Service Attacks
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Privilege Escalation
- Identifying TCP/IP Security Concerns
  - Working with the TCP/IP Suite
  - Understanding Encapsulation
  - Working with Protocols and Services
  - Recognizing TCP/IP Attacks
  - Understanding Software Exploitation
  - Understanding OVAL.
- Surviving Malicious Code
  - Viruses
  - Trojan Horses
  - Logic Bombs
  - Worms
  - Antivirus Software
- Understanding Social Engineering
  - Introducing Auditing Processes and Files

Module 3: Infrastructure and Connectivity
- Understanding Infrastructure Security
  - Working with Hardware Components
  - Working with Software Components
- Understanding the Different Network Infrastructure Devices
  - Firewalls
  - Hubs
  - Modems
  - Remote Access Services
  - Routers
  - Switches
  - Telecom/PBX Systems
  - Virtual Private Networks
  - Wireless Access Points
- Monitoring and Diagnosing Networks
- Network Monitors
- Intrusion Detection Systems
- Securing Workstations and Servers
- Understanding Mobile Devices
  - Understanding Remote Access
  - Using Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Using 802.1x Wireless Protocols
  - Working with RADIUS
  - TACACS+
- Securing Internet Connections
- Working with Ports and Sockets
- Working with E-Mail
- Working with the Web
- Working with File Transfer Protocol
- Understanding Network Protocols
- The Basics of Cabling, Wires, and Communications
  - Coax
  - Unshielded Twisted Pair and Shielded Twisted Pair
  - Fiber Optic
  - Infrared
  - Radio Frequencies
  - Microwave Systems
- Employing Removable Storage
  - CD-R/DVD-R
  - Diskettes
  - Flash Cards
  - Hard Drives
  - Network Attached Storage
  - Smart Cards
  - Tape
  - Thumb Drives

Module 4: Monitoring Activity and Intrusion Detection
- Monitoring the Network
  - Recognizing the Different Types of Network Traffic
  - Monitoring Network Systems
- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots
  - Understanding Incident Response
- Working with Wireless Systems
  - Wireless Transport Layer Security
  - IEEE 802.11x Wireless Protocols
  - WEP/WAP
  - Wireless Vulnerabilities to Know
- Understanding Instant Messaging’s Features
  - Understanding IM Vulnerabilities
  - Controlling Privacy
- Working with 8.3 File Naming
- Understanding Protocol Analyzers
- Understanding Signal Analysis and Intelligence
  - Footprinting
  - Scanning

Module 5: Implementing and Maintaining a Secure Network
- Overview of Network Security Threats
- Defining Security Baselines
- Hardening the OS and NOS
- Configuring Network Protocols
Module 6: Securing the Network and Environment

- Understanding Physical and Network Security
  - Implementing Access Control
  - Understanding Social Engineering
  - Scanning the Environment
- Understanding Business Continuity Planning
  - Undertaking Business impact Analysis
  - Assessing Risk
- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
- Working with Security Standards and ISO 17799
- Classifying Information
  - Public Information
  - Private Information
  - Roles in the Security Process
  - Information Access Controls

Module 7: Cryptography Basics, Methods, and Standards

- An Overview of Cryptography
  - Understanding Physical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms

Module 8: Security Policies and Procedures

- Understanding Business Continuity
  - Utilities
  - High Availability
  - Disaster Recovery
Module 9: Security Administration

- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements
- Generating Policies and Procedures
  - Human Resource Policies
  - Business Policies
  - Certificate Policies
  - Incident-Response Policies
- Enforcing Privilege Management
  - User and Group Role Management
  - Privilege Escalation
  - Single Sign-On Initiatives
  - Privilege Decision Making
  - Auditing
  - Access Control

- Understanding Security Management
  - Drafting Best Practices and Documentation
  - Simplifying Security Administration
  - Understanding Security Awareness and Education
  - Using Communication and Awareness
  - Providing Education
- Staying on Top of Security
  - Websites
  - Trade Publications
- Regulating Privacy and Security
  - The Health Insurance Portability and Accountability Act
  - The Gramm-Leach-Bliley Act of 1999
  - The Computer Fraud and Abuse Act
  - The Family Educational Rights and Privacy Act
  - The Computer Security Act of 1987
  - The Cyberspace Electronic Security Act
  - The Cyber Security Enhancement Act
  - The Patriot Act
  - Familiarizing Yourself with International Efforts
About this Course

CompTIA Linux+ Powered by LPI is a high-stakes, vendor-neutral certification that validates the fundamental knowledge and skills required of junior Linux administrators.

The two leading Linux certification bodies, CompTIA and Linux Professional Institute (LPI), have joined forces to release two new Linux+ exams, LX0-101 and LX0-102. This training course breaks down everything you need to prepare for the exams. Covering all exam objectives, the course will teach you Linux command-line tools, managing software, configuring hardware, managing files and file systems, and much more.

Audience Profile

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration, or to prepare for the CompTIA Linux+ Powered by LPI (Exams LX0-01, LX0-102).

At Course Completion

After completing this course, students will be able to:

- Implement Linux command-line tools
- Manage software
- Configure hardware
- Understand boot process and scripts
- Manage files and file systems
- Administer the Windows X system-networking, server and system security

Prerequisites

CompTIA A+ certification, or the equivalent skills and knowledge, is helpful but not required.

Course Outline

Module 1: Exploring Linux Command-Line Tools

- Understanding Command-Line Basics Exploring Your Linux Shell Options
- Using a Shell
- Exploring Shell Configuration
- Using Environment Variables
- Getting Help
- Using Streams, Redirection, and Pipes
- Exploring Types of Streams
- Redirecting Input and Output
- Piping Data Between Programs
- Generating Command Lines
- Processing Text Using Filters
- File-Combining Commands
- File-Transforming Commands

Module 2: Managing Software

- File-Formatting Commands
- File-Viewing Commands
- File-Summarizing Commands
- Using Regular Expressions
- Understanding Regular Expressions
- Using grep
- Using sed

- Package Concepts
- Using RPM
- RPM Distributions and Conventions
- The rpm Command Set
- Extracting Data from RPMs
- Using Yum
- RPM and Yum Configuration Files
Module 3: Configuring Hardware
- Configuring the BIOS and Core Hardware
- Understanding the Role of the BIOS
- IRQs
- I/O Addresses
- DMA Addresses
- Boot Disks and Geometry Settings
- Coldplug and Hotplug Devices
- Configuring Expansion Cards
- Configuring PCI Cards
- Learning about Kernel Modules
- Loading Kernel Modules
- Removing Kernel Modules
- Configuring USB Devices
- USB Basics
- Linux USB Drivers
- USB Manager Applications
- Configuring Hard Disks
- Configuring PATA Disks
- Configuring SATA Disks
- Configuring SCSI Disks
- Configuring External Disks
- Designing a Hard Disk Layout
- Why Partition?

Module 4: Managing Files
- Managing Files
- File Naming and Wildcard Expansion Rules
- File Commands
- File Archiving Commands
- Managing Links
- Directory Commands
- Managing File Ownership
- Assessing File Ownership
- Changing a File’s Owner
- Changing a File’s Group
- Controlling Access to Files
- Understanding Permissions
- Changing a File’s Mode
- Setting the Default Mode and Group
- Changing File Attributes
- Managing Disk Quotas
- Enabling Quota Support
- Setting Quotas for Users
- Locating Files
- The FHS
- Tools for Locating Files

Module 5: Booting Linux and Editing Files
- Installing Boot Loaders
- Boot Loader Principles
- Using LILO as the Boot Loader
- Using GRUB as the Boot Loader
- Understanding the Boot Process
- Extracting Information about the Boot Process
- Locating and Interpreting Boot Messages
- The Boot Process
- Dealing with Runlevels and the Initialization Process
- Runlevel Functions
- Identifying the Services in a Runlevel
Module 6: Configuring the X Window System
- Localization, and Printing
- Configuring Basic X Features
- X Server Options for Linux
- Methods of Configuring X
  - X Configuration Options
  - Obtaining X Display Information
- Configuring X Fonts
  - Font Technologies and Formats
- Configuring X Core Fonts
- Configuring a Font Server
- Configuring Xft Fonts
- Managing GUI Logins
- The X GUI Login System
- Running an XDMCP Server
- Configuring an XDMCP Server
  - Using X for Remote Access
- X Client/Server Principles
- Using Remote X Clients
- X Accessibility
  - Keyboard and Mouse Accessibility Issues
  - Screen Display Settings
- Using Additional Assistive Technologies
  - Configuring Localization and Internationalization
  - Setting Your Time Zone
- Querying and Setting Your Locale
  - Configuring Printing
  - Conceptualizing the Linux Printing Architecture
  - Understanding PostScript and Ghostscript
  - Running a Printing System
  - Configuring CUPS
  - Monitoring and Controlling the Print Queue

Module 7: Administering the System
- Managing Users and Groups
- Understanding Users and Groups
- Configuring User Accounts
- Configuring Groups
- Tuning User and System Environments
- Using System Log Files
- Using syslogd
- Setting Logging Options
- Manually Logging Data
- Rotating Log Files

Module 8: Configuring Basic Networking
- Understanding TCP/IP Networking
- Knowing the Basic Functions of Network Hardware
- Investigating Types of Network Hardware
- Understanding Network Packets
- Understanding Network Protocol Stacks
- Knowing TCP/IP Protocol Types
- Understanding Network Addressing
- Using Network Addresses
  - Resolving Hostnames
- Network Ports
  - Configuring Linux for a Local Network
  - Network Hardware Configuration
  - Configuring with DHCP
  - Configuring with a Static IP Address
  - Configuring Routing
  - Using GUI Configuration Tools
  - Using the ifup and ifdown Commands
  - Configuring Hostnames
  - Diagnosing Network Connections
  - Testing Basic Connectivity
  - Tracing a Route
  - Checking Network Status
  - Examining Raw Network Traffic
  - Using Additional Tools

Module 9: Writing Scripts, Configuring E-mail, and Using Databases
- Managing the Shell Environment
- Reviewing Environment Variables
- Understanding Common Environment Variables
- Using Aliases
  - Modifying Shell Configuration Files
  - Writing Scripts
  - Beginning a Shell Script
  - Using Commands
  - Using Variables
  - Using Conditional Expressions
  - Using Loops
  - Using Functions
CTIA-1104: CompTIA Linux+

COURSE OUTLINE

Managing E-mail
- Understanding E-mail
- Choosing E-mail Software
- Managing E-mail
- Securing Your E-mail Server
- Managing Data with SQL
- Picking a SQL Package
- Understanding SQL Basics
- Using MySQL

Module 10: Securing Your System
- Administering Network Security
- Using Super Server Restrictions
- Disabling Unused Servers

- Administering Local Security
- Securing Passwords
- Limiting root Access
- Setting Login, Process, and Memory Limits
- Locating SUID/SGID Files
- Configuring SSH
- SSH Basics
- Setting SSH Options for Your System
- SSH Security Considerations
- Using GPG
- Generating and Importing Keys
- Encrypting and Decrypting Data
- Signing Messages and Verifying Signatures
The CompTIA Server+ certification is an international vendor neutral credential that validates skills and knowledge needed to build and support server hardware.

**Required Exams**

To earn the CompTIA Server+ certification, students must pass exam SK0-003.

**Audience Profile**

This course is intended for students seeking to earn the CompTIA Server+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

**At Course Completion**

After completing this course, students will have the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. Students will be able to:

- Identify environmental issues
- Understand and comply with disaster recovery and physical / software security procedures
- Be familiar with industry terminology and concepts
- Understand server roles / specializations and interaction within the overall computing environment.

**Prerequisites**

The CompTIA Server+ certification is targeted towards individuals with 18-24 months of IT experience. Although not a prerequisite, it is recommended that CompTIA Server+ candidates hold a CompTIA A+ certification.

**Course Outline**

### 1.0 System Hardware

1.1 Differentiate between system board types, features, components and their purposes.
- Dip switches / jumpers
- Processor (single and multi)
- Bus types and bus speeds
- On board components
- Expansion slots
- BIOS
- Riser Card / backplane
- Storage connectors

### 1.2 Deploy different chassis types and the appropriate components
- Cooling
- Form Factor (tower, rack, blade)
- Power
- Redundant power
- Shut off switches – chassis intrusion
- Power buttons
- Reset buttons
- Diagnostic LEDs
- Expansion bays
1.3 Differentiate between memory features / types and given a scenario select appropriate memory
- Memory pairing
- ECC vs. non-ECC
- Registered vs. non-registered
- RAID and hot spares
- Types
- Memory compatibility
- On board vs. riser card

1.4 Explain the importance of a Hardware Compatibility List (HCL)
- Vendor standards for hardware
- Memory and processor compatibility
- Expansion cards compatibility
- Virtualization requirements

1.5 Differentiate between processor features / types and given a scenario select the appropriate processor
- Multicore
- Multiprocessor
- Cache levels
- Stepping
- Speed
- VRMs
- Execute disable (XD) or not execute (NX)
- Hyper-Threading
- VT or AMD-V
- AMD vs. Intel (non-compatible CPUs)
- Processor architecture (RISC, CISC)
- Vendor slot types
- 64bit vs. 32bit
- Heat dissipation (heat sinks, fans, liquid cooling)

1.6 Given a scenario, install appropriate expansion cards into a server while taking fault tolerance into consideration.
- Manufacturer specific
- HBAs
- NICs
- Video
- Audio
- Storage controller (SCSI, SATA, RAID)
- Port expansion cards

1.7 Install, update and configure appropriate firmware.
- Driver / hardware compatibility
- Implications of a failed firmware upgrade (redundant BIOS)
- Follow manufacturer instructions and documentation

2.0 Software

2.1 Install, deploy, configure and update NOS (Windows / *nix).
- Installation methods (optical media, USB, network share, PXE)
- virtualization templates
- Bootloader
- File systems
- Driver installation
- Configure NOS
- Patch management

2.2 Explain NOS security software and its features.
- Software firewall
- Malware protection software
- Basics of file level permissions vs. share permissions

2.3 Given a scenario, implement and administer NOS management features based on procedures and guidelines
- User management
- Resource management
- Monitoring (tools and agents)

2.4 Explain different server roles, their purpose and how they interact
- File and print server
- Database server
- Web server
- Messaging server
- DHCP server
- Directory services server
- DNS server
- Application server
- Remote access server
- Virtualized services
- NTP server
- Explain the difference between a workstation, desktop and a server
- Server shut down and start up sequence (one server vs. multiple servers vs. attached components)

2.5 Summarize server virtualization concepts, features and considerations
- Resource utilization
- Configuration
- Interconnectivity
- Management server
- Reasons for virtualization

2.6 Describe common elements of networking essentials
- TCP/IP
- Ethernet
- VPN
- VLAN
- DMZ
3.0 Storage

3.1 Describe RAID technologies and its features and benefits
- Hot spare
- Software vs. hardware
- Cache read/write levels (data loss potential)
- Performance benefits and tradeoffs

3.2 Given a scenario, select the appropriate RAID level
- 0, 1, 3, 5, 6, 10, 50
- Performance benefits and tradeoffs

3.3 Install and configure different internal storage technologies
- Hot swappable vs. non-hot swappable
- SCSI, Ultra SCSI, Ultra320 (termination), LUNs
- SAS, SATA
- Tape
- Optical
- Flash
- Floppy (USB)
- Controller (firmware levels)
- Hard drive (firmware, JBOD)

3.4 Summarize the purpose of external storage technologies
- Network attached storage
- Storage area network
- Tape library
- WORM
- Optical jukebox
- Transport media

4.0 IT Environment

4.1 Write, utilize and maintain documentation, diagrams and procedures
- Follow pre-installation plan when building or upgrading servers
- Labeling
- Diagram server racks and environment topologies
- Hardware and software upgrade, installation, configuration, server role and repair logs
- Document server baseline (before and after service)
- Original hardware configuration, service tags, asset management and warranty
- Vendor specific documentation

4.2 Given a scenario, explain the purpose of the following industry best practices
- Follow vendor specific server best practices
- Explore ramifications before implementing change – determine organizational impact
- Communicate with stakeholders before taking action and upon completion of action
- Comply with all local laws / regulations, industry and corporate regulations

4.3 Determine an appropriate physical environment for the server location
- Check for adequate and dedicated power, proper amperage and voltage communication and shut down, proper monitoring
- Server cooling considerations – HVAC

4.4 Implement and configure different methods of server access
- KVM (local and IP based)
- Direct connect

4.5 Given a scenario, classify physical security measures for a server location
- Physical server security
- Access control devices (RFID, keypads, pinpads)
- Security procedures
- Defense in-depth – multiple layers of defense
- Reasons for physical security
- Secure documentation related to servers

5.0 Disaster Recovery

5.1 Compare and contrast backup and restoration methodologies, media types and concepts
- Methodologies (full, incremental, differential, selective)
- Media types
- Backup security and off-site storage
- Importance of testing the backup and restoration process

5.2 Given a scenario, compare and contrast the different types of replication methods
- Disk to disk
- Server to server
- Site to site
- Site types

5.3 Explain data retention and destruction concepts
- Awareness of potential legal requirements
- Awareness of potential company policy requirements
- Differentiate between archiving and backup

5.4 Given a scenario, carry out the following basic steps of a disaster recovery plan
- Disaster recovery testing process
- Follow emergency procedures (people first)
- Use appropriate fire suppressants
- Follow appropriate fire suppressants
- Classification of systems (prioritization during recovery)
6.0 Troubleshooting

6.1 Explain troubleshooting theory and methodologies
- Identify the problem and determine the scope environment
- Establish a theory of probable cause (question the obvious) multiple problems
- Test the theory to determine cause
- Establish a plan of action to resolve the problem and notify impacted users
  - Implement the solution or escalate as appropriate resolved the problem
  - Implement new change
  - Verify full system functionality and if applicable implement preventative measures
  - Perform a root cause analysis
  - Document findings, actions and outcomes throughout the process

6.2 Given a scenario, effectively troubleshoot hardware problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Environmental issues
- Hardware tools

6.3 Given a scenario, effectively troubleshoot software problems, selecting the appropriate tools and methods
- Common problems
- Cause of common problems
- Software tools

6.4 Given a scenario, effectively diagnose network problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Networking tools

6.5 Given a scenario, effectively troubleshoot storage problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Storage tools
The CASP certification is an international, vendor-neutral exam that proves competency in enterprise security; risk management; research and analysis; and integration of computing, communications, and business disciplines.

The exam covers the technical knowledge and skills required to conceptualize, design, and engineer secure solutions across complex enterprise environments. It involves applying critical thinking and judgment across a broad spectrum of security disciplines to propose and implement solutions that map to enterprise drivers. For more detailed information,

The CompTIA Advanced Security Practitioner certification was accredited by the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI) on Dec. 13, 2011.

Students will examine advanced security concepts, principles, and implementations that pertain to enterprise-level security.

The CompTIA CASP requires one test: CAS-001

Audience Profile

This course is targeted toward an IT professional that has the technical knowledge and skills required to conceptualize, design, and engineer secure solutions across complex enterprise environments. Students aspiring to CASP certification should have a minimum of 10 years experience including at least five years of hands-on technical security experience.

At Course Completion

Upon successful completion of this course, students will be able to:

- Identify enterprise security fundamentals.
- Apply enterprise security technology solutions.
- Identify enterprise resource technologies and the potential security implications for these resources.
- Design security solutions.
- Identify application security design issues such as best practices for development and testing as well as threat mitigation techniques.
- Manage risk, security policies, and security procedures within an enterprise.
- Integrate security solutions within an enterprise.
- Conduct security research and analysis.

Prerequisites

While there are no strict prerequisites, CompTIA intends the CASP certification to serve as an add-on to the CompTIA® Security+® certification, or equivalent technical experience.

Recommended courses (or the equivalent certifications):

- CompTIA® Security+® is strongly recommended.
- CompTIA® A+® Certification
Lesson 1: The Enterprise Security Architecture
- Topic 1A: The Basics of Enterprise Security
- Topic 1B: The Enterprise Structure
- Topic 1C: Enterprise Security Requirements

Lesson 2: Enterprise Security Technology
- Topic 2A: Common Network Security Components and Technologies
- Topic 2B: Communications and Collaboration Security
- Topic 2C: Cryptographic Tools and Techniques
- Topic 2D: Advanced Authentication

Lesson 3: Enterprise Resource Technology
- Topic 3A: Enterprise Storage Security Issues
- Topic 3B: Distributed, Shared, and Virtualized Computing
- Topic 3C: Cloud Computing and Security

Lesson 4: Security Design and Solutions
- Topic 4A: Network Security Design
- Topic 4B: Conduct a Security Assessment
- Topic 4C: Host Security

Lesson 5: Application Security Design
- Topic 5A: Application Security Basics
- Topic 5B: Web Application Security

- Topic 6A: Analyze Security Risk
- Topic 6B: Implement Risk Mitigation Strategies and Controls
- Topic 6C: Implement Enterprise-Level Security Policies and Procedures
- Topic 6D: Prepare for Incident Response and Recovery

Lesson 7: Enterprise Security Integration
- Topic 7A: The Technology Life Cycle
- Topic 7B: Inter-Organizational Change
- Topic 7C: Integrate Enterprise Disciplines to Achieve Secure Solutions

Lesson 8: Security Research and Analysis
- Topic 8A: Perform an Industry Trends and Impact Analysis
- Topic 8B: Perform an Enterprise Security Analysis
The program is a 3-day, instructor-led course that:

- Provides a comprehensive overview of all of the ITIL disciplines, including objectives, terminology, responsibilities, and critical success factors
- Prepares the attendee to take the ITIL V3 Foundation certification examination
- Helps the attendee to leverage the ITIL V3 disciplines and practices in their work environment

**Audience Profile**

The ITIL V3 Foundation training course is an introductory-level course. It is offered to professionals responsible for leading, building, supporting, and operating the information technology services delivery aspects of their organizations IT infrastructure or to consulting and other business professionals who need to upgrade their skills.

**At Course Completion**

On completion of the ITIL V3 Foundation Training Course attendees will be ready to take the certification examination leading to the Information Technology Infrastructure Library Foundation Certificate. This is a forty question, multiple-choice examination lasting one hour. Attendees would also have the learning foundation necessary to begin or carry-on the process of ITIL discipline implementation in any organization.

**Study Materials**

This course includes handouts and references useful after the class, as well as practice sessions, quizzes, exam strategies, and test-taking tips. The one-hour ITIL v3 Foundation exam will be offered on the last day of class.

**Prerequisites**

There are no prerequisites for this course. However, some knowledge of service management terminology and concepts would be helpful.

**Course Outline**

This course will cover the fundamentals of the service lifecycle phases of ITIL V3. The curriculum is as follows:

- Introduction to ITIL and ITSM
- Service Strategy
- Service Design
- Service Transition
- Service Operation
- Service Improvement
- ITIL Foundation Certificate Examination

These disciplines represent a service lifecycle framework that further enhances alignment to the business while demonstrating business value and ROI and enabling IT to solve specific operational needs.
Fundamentals of the Java Programming Language, Java SE 6
Course#: JAVA-1102

About this Course
The Fundamentals of the Java Programming Language course was designed to enable students with little or no programming experience to begin to learn programming using the Java programming language. The course teaches the significance of object-oriented programming, the keywords and constructs of the Java programming language, and the steps required to create simple Java technology programs. Students taking this course can receive a solid basis in the Java programming language upon which to base continued work and training.

Audience Profile
- Beginners to programming who have basic mathematical, logical, and analytical problem-solving skills and who want to begin learning the Java programming language. This includes technical writers, web developers, technical managers, and individuals with a technical, non-programming background, such as system administrators
- Novice programmers and those programmers who prefer to start learning the Java programming language at an introductory level.
- Students who wish to begin their study of the Sun Certified Java Associate (SCJA) exam

At Course Completion
After completing this course, students will be able to:
- Demonstrate knowledge of Java technology, the Java programming language, and the product life cycle
- Use various Java programming language constructs to create several Java technology applications
- Use decision and looping constructs and methods to dictate program flow
- Implement intermediate Java technology programming and object-oriented (OO) concepts in Java technology programs

Prerequisites
There are no prerequisites for attending the course.

Course Outline

Module 1: Explaining Java Technology
- Describe key concepts of the Java programming language
- List the three Java technology product groups
- Summarize each of the seven stages of the product life cycle

Module 2: Analyzing a Problem and Designing a Solution
- Analyze a problem using object-oriented analysis
- Design classes from which objects will be created

Module 3: Developing and Testing a Java Technology Program
- Identify the four components of a class in the Java programming language
- Use the main method in a test class to run a Java technology program from the command line
- Compile and execute a Java technology program

Module 4: Declaring, Initializing, and Using Variables
- Identify the use the syntax for variables and define the syntax for a variable
- List the eight Java programming language primitive data types
- Declare, initialize, and use variables and constants according to Java programming language guidelines and coding standards
- Modify variable values using operators
- Use promotion and type casting

Module 5: Creating and Using Objects
- Declare, instantiate, and initialize object reference variables
- Compare how object reference variables are stored in relation to primitive variables
- Use a class (the String class) included in the Java Software Developer Kit (SDK)
- Use the Java 2 Platform, Standard Edition (J2SE(TM)) class library specification to learn about other classes in this application programming interface (API)
Module 6: Using Operators and Decision Constructs
- Identify relational and conditional operators
- Create if and if/else constructs
- Use the switch construct

Module 7: Using Loop Constructs
- Create while loops
- Develop for loops
- Create do/while loops

Module 8: Developing and Using Methods
- Describe the advantages of methods and define worker and calling methods
- Declare and invoke a method
- Compare object and static methods

Module 9: Implementing Encapsulation and Constructors
- Use encapsulation to protect data
- Create constructors to initialize objects

Module 10: Creating and Using Arrays
- Code one-dimensional arrays
- Set array values using length attribute and a loop
- Pass arguments to the main method for use in a program
- Create two-dimensional arrays

Module 11: Implementing Inheritance
- Define and test your use of inheritance
- Explain abstraction
- Explicitly identify class libraries used in your code
About this Course

This hands-on instructor-led course is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in Linux commands and the Linux Environment. Linux is used for the hands on labs in this course and this course is applicable for all UNIX and Linux variants including HP-UX, AIX, Solaris, Caldera and Red Hat.

At Course Completion

After completing this course, students will be able to:

- Navigating Linux environment
- Commonly used commands
- Process Control
- Linux file system management
- Linux file related commands
- Text filtering and processing
- Printing and backups
- Using the vi Editor

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Introduction to Linux

- UNIX History
- The UNIX Layers
- The Shell
- Shell Versions
- Shell Prompts

Logging In and Looking Around

- Logging In
- Password Maintenance: passwd
- Special Keys Assignment: stty
- Changing stty Assignments
- Other stty Assignments
- Control Key Values
- Manual Help: man
- Man Page Description
- Man Page Sections
- Paging Output: pg
- Login Profile: .profile

Process Control

- Users and Processes: who
- Displaying the Process: ps
- ps options
- Background Processing: bg, fg
- Job Priorities: nice
- Killing a Process: kill

Shell Substitutions

- stdin, stdout, stderr
- Input Redirection: <file
- Output Redirection: >file
- Variable Types
- Exporting Local Variables: export
- Viewing Variables: echo
- Variable Substitution: $name
- Escaping Characters: /char
- Escaping Variable Names: $(name)
- Command Substitution: `cmd`
The UNIX File System
- Directory Listings: ls
- ls Switches
- Important Directories
- Absolute & Relative Paths
- $HOME and $PATH
- Directory Commands: pwd, cd, mkdir, rmdir
- Disk Usage: df
- File Types
- Links: ln
- File Permissions: r,w,x
- Permission Bits
- Changing Permissions: chmod, chown, chgrp

File Related Commands
- Finding Files: find
- Options For find
- Removing Files: rm
- Moving Files: mv
- Copying Files: cp
- Touching a File: touch
- Concatenating Files: cat
- Seeing the Beginning: head
- Seeing the Ending: tail
- Counting Word & Lines: wc

Text Filtering and Processing
- Cutting Out Data: cut
- Examples Using cut
- Locating Text Within Files: grep
- Examples Using grep
- To See the Interim Data: tee
- Sorting Data: sort
- Examples Using sort
- Translating Data: tr
- Splitting Long Lines: fold

Printing and Backups
- The Print Spooler
- Submitting a Print Request: lp
- Examples of lp
- Viewing the Print Queue: lpstat
- Canceling a Print Request: cancel
- Backups using tar
- Examples of tar
- The Copy I/O Archive: cpio
- cpio Options
- Examples of cpio
- Direct Device Copying: dd
- compress and uncompress

The vi Editor
- The Benefits of vi
- Workspace
- Starting vi
- Modes
- A Sample vi Screen
- vi Line Text Movement
- vi Line Positioning
- vi Page Positioning
- vi Search Patterns
- vi Text Insert
- vi Text Modify
- vi Move/Copy Text
- ex End/Edit Another
- ex Command Syntax
- ex Commands
- Regular Expressions
- Miscellaneous
- Some Set Options
About this Course

This hands-on instructor-led course, the companion course to Linux Fundamentals is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in setting up Shell Scripts and builds the Linux knowledge acquired in Linux Fundamentals. Bourne Again Shell (BASH) is used for the hands-on portion of the course. Students will also see examples of other Shells, including C, Born and Korn Shell.

At Course Completion

After completing this course, students will be able to:

- Shell data types
- Branch and Loop techniques
- Running a Shell script
- Data input
- Trace and Traps
- Shell scripting optimization

Prerequisites

Students should have taken course LIN-2101: Linux Fundamentals or have equivalent experience with Linux.

Course Outline

Shell Basics

- Startup Files
- Running a Script
- Print v Echo
- I/O Streams
- Command Grouping
- Arguments to a Script
- Some Other Special Variables
- Patterns

Shell Variables’ Data Types

- Variable Basics
- Substring Deletion
- Typeset
- Integers
- Arithmetic Operators
- Arrays
- Setting Multiple Elements

Branch and Loop

- Tests and Comparisons
- String and Number Tests
- File/Directory Tests
- Permission, Misc. Tests
- The exit Statement
- The if Statement
- The case Statement
- The while Loop
- The until Loop
- The for Loop
- Break from a Loop
- Continue Next Iteration

Running a Script

- Print v Echo
- I/O Streams
- Command Grouping
- Arguments to a Script
- Some Other Special Variables
- Patterns
**Data Input**
- Read Data
- Here Document Data
- Menu Selection
- select Example
- Get Command Arguments
- getopts

**Trace and Traps**
- Turning Trace On
- Traps
- Functions
- Permanence and Pervasiveness
- Formatted Printing
- Conditions and Loops
- Do Loops
- Arrays

**Shell Scripting Optimization**
- Patterns
- Setting Default Values
- Substring Deletion
- Arithmetic Operators
- String and Number Tests
- File/Directory Tests
- Permission, Misc. Tests
- Line Text Movement
- Line Positioning
- Page Positioning
- Search Patterns
- Text Insert
- Text Modify
- Move/Copy Text
- End/Edit Another
- ex Commands
About this Course

This course combines Linux Fundamentals and the companion Linux Shell scripting into a 5 day class. This hands-on instructor-led course is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in Linux commands and the Linux Environment and setting up shell scripts to automate system admin tasks. This is the introduction to the UNIX and Linux environment Linux is used for the hands on labs in this course and this course is applicable for all UNIX and Linux variants including HP-UX, AIX, Solaris, Caldera and Red Hat.

At Course Completion

After completing this course, students will be able to:

- Navigating Linux environment
- Commonly used commands
- Process Control
- Linux file system management
- Linux file related commands
- Text filtering and processing
- Printing and backups
- Using the vi Editor
- Shell data types
- Branch and Loop techniques
- Running a Shell script
- Data input
- Trace and Traps
- Shell scripting optimization

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Introduction to Linux

- UNIX History
- The UNIX Layers
- The Shell
- Shell Versions
- Shell Prompts

Logging In and Looking Around

- Logging In
- Password Maintenance: passwd
- Special Keys Assignment: stty
- Changing stty Assignments

- Other stty Assignments
- Control Key Values
- Manual Help: man
- Man Page Description
- Man Page Sections
- Paging Output: pg
- Login Profile: .profile

Process Control

- Users and Processes: who
- Displaying the Process: ps
- ps options
- Background Processing: bg, fg
Shell Substitutions
- stdin, stdout, stderr
- Input Redirection: <file
- Output Redirection: >file
- Variable Types
- Exporting Local Variables: export
- Viewing Variables: echo
- Variable Substitution: $name
- Escaping Characters: /char
- Escaping Variable Names: $(name)
- Command Substitution: `cmd`

The UNIX File System
- Directory Listings: ls
- Is Switches
- Important Directories
- Absolute & Relative Paths
- $HOME and $PATH
- Directory Commands: pwd, cd, mkdir, rmdir
- Disk Usage: df
- File Types
- Links: ln
- File Permissions: r,w,x
- Permission Bits
- Changing Permissions: chmod, chown, chgrp

File Related Commands
- Finding Files: find
- Options For find
- Removing Files: rm
- Moving Files: mv
- Copying Files: cp
- Touching a File: touch
- Concatenating Files: cat
- Seeing the Beginning: head
- Seeing the Ending: tail
- Counting Word & Lines: wc

Text Filtering and Processing
- Cutting Out Data: cut
- Examples Using cut
- Locating Text Within Files: grep
- Examples Using grep
- To See the Interim Data: tee
- Sorting Data: sort
- Examples Using sort
- Translating Data: tr
- Splitting Long Lines: fold

- Putting Text Together: paste
- Examples Using paste

Printing and Backups
- The Print Spooler
- Submitting a Print Request: lp
- Examples of lp
- Viewing the Print Queue: lpstat
- Canceling a Print Request: cancel
- Backups using tar
- Examples of tar
- The Copy I/O Archive: cpio
- cpio Options
- Examples of cpio
- Direct Device Copying: dd
  - compress and uncompress

The vi Editor
- The Benefits of vi
- wWorkspace
- Starting vi
- Modes
- A Sample vi Screen
- vi Line Text Movement
- vi Line Positioning
- vi Page Positioning
- vi Search Patterns
- vi Text Insert
- vi Text Modify
- vi Move/Copy Text
  - sx End/Edit Another
- sx Command Syntax
- sx Commands
- Regular Expressions
- Miscellaneous
- Some Set Options

Shell Basics
- Startup Files
- Running a Script
- Print v Echo
- I/O Streams
- Command Grouping
- Arguments to a Script
- Some Other Special Variables
- Patterns

Shell Variables’ Data Types
- Variable Basics
- Substring Deletion
- Typeset
• Integers
• Arithmetic Operators
• Arrays
• Setting Multiple Elements

Branch and Loop
• Tests and Comparisons
• String and Number Tests
• File/Directory Tests
• Permission, Misc. Tests
• The exit Statement
• The if Statement
• The case Statement
• The while Loop
• The until Loop
• The for Loop
• Break from a Loop
• Continue Next Iteration

Running a Script
• Print v Echo
• I/O Streams
• Command Grouping
• Arguments to a Script
• Some Other Special Variables
• Patterns

Data Input
• Read Data
• Here Document Data
• Menu Selection

• select Example
• Get Command Arguments
• getopts

Trace and Traps
• Turning Trace On
• Traps
• Functions
• Permanence and Pervasiveness
• Formatted Printing
• Conditions and Loops
• Do Loops
• Arrays

Shell Scripting Optimization
• Patterns
• Setting Default Values
• Substring Deletion
• Arithmetic Operators
• String and Number Tests
• File/Directory Tests
• Permission, Misc. Tests
• Line Text Movement
• Line Positioning
• Page Positioning
• Search Patterns
• Text Insert
• Text Modify
• Move/Copy Text
• End/Edit Another
• sx Commands
Successfully managing a project requires effective planning and adherence to the industry's best practices in every step of the process. By understanding the fundamentals of project management, you will be better prepared to initiate a project in your organization and position it for success. In this course, you will identify effective project management practices and their related processes.

**Course Objective:** You will examine the elements of sound project management and apply the generally recognized practices to successfully manage projects.

This course features an Instructor-led, group-paced, classroom-delivery learning model with structured hands-on activities.

**Audience Profile**

This course is designed for individuals whose primary job is not project management, but who manage projects on an informal basis. Also, anyone who is considering a career path in project management and desiring a complete overview of the field and its generally accepted practices can take up this course.

**At Course Completion**

Upon successful completion of this course, students will be able to:

- identify the key processes and requirements of project management.
- initiate a project.
- plan for time and cost.
- plan for project risks, communication, and change control.
- manage a project.
- execute the project closeout phase.

**Prerequisites**

To ensure your success, it is recommended that you first take the following course: Microsoft® Office Word® 2007 or 2010: Level 1; or have equivalent knowledge. Some on-the-job experience in participating in managed projects would be preferable.

**Course Outline**

*Lesson 1: Getting Started with Project Management*

- Describe a Project
- Describe the Project Management Life Cycle
- Identify the Role of a Project Manager

*Lesson 2: Initiating a Project*

- Determine the Scope of a Project
- Identify the Skills for a Project Team
- Identify the Risks to a Project

*Lesson 3: Planning for Time and Cost*

- Create a Work Breakdown Structure
- Sequence the Activities
- Create a Project Schedule
- Determine Project Costs

*Lesson 4: Planning for Project Risks, Communication, and Change Control*

- Analyze the Risks to a Project
- Create a Communication Plan
- Plan for Change Control
Lesson 5: Managing a Project
- Begin Project Work
- Execute the Project Plan
- Track Project Progress
- Report Performance
- Implement Change Control

Lesson 6: Executing the Project Closeout Phase
- Close a Project
- Create a Final Report
This course will prepare you to identify and apply generally recognized practices in project management.

**Audience Profile**

The target student for this course is any individual who may need to perform project management activities in their job role on either a formal or informal basis, or any project team members who want to enhance their knowledge of project management in order to interact more productively with a project manager and perform more effectively on a project team.

**At Course Completion**

Upon successful completion of this course, students will be able to:

- identify the basic concepts and terminology of professional project management.
- launch a project.
- estimate project work.
- create a project schedule.
- plan project costs.
- plan for project risks.
- plan for project quality and compliance.
- manage human resources for your project.
- manage project procurements.
- plan for change management and monitor the project scope.
- monitor and optimize project schedule and cost.
- monitor quality of project work and the risks involved.
- plan communication strategies and manage stakeholder relationships.
- perform project closure.

**Prerequisites**

Work experience with project management and knowledge of the roles, responsibilities, and skills required for project management is needed. Also, basic working knowledge of office productivity tools is required. The Project Management Fundamentals course is recommended for students as a prerequisite to this course.

**Course Outline**

**Lesson 1: Getting Started with Project Management**

- Project Management Basics
- Factors Influencing a Project

**Lesson 2: Launching Projects**

- How Organizations Choose the Right Project
- Identify Project Stakeholders and Their Expectations
- Identify the Project Scope
- Prepare a SOW
- Formally Authorize a Project

**Lesson 3: Estimating Project Work**

- Estimate Project Effort and Resources Using Top-Down Estimation
- Estimate Project Effort and Resources Using Bottom-Up Estimation
- Reduce Risks in Project Estimates

**Lesson 4: Creating a Project Schedule**

- Illustrate Project Flow
- Identify Activity Resources
- Schedule Project Work
Lesson 5: Planning Project Costs
- Estimate Project Costs
- Establish the Cost Baseline
- Reconcile Funding and Costs

Lesson 6: Planning for Risks
- Create a Risk Management Plan
- Identify Risks and Their Causes
- Analyze Risks
- Develop a Risk Response Plan

Lesson 7: Planning for Quality and Compliance
- Deliver the Desired Project Results
- Verify Compliance Requirements

Lesson 8: Managing Human Resources
- Plan Your Dream Team
- Put the Team Together
- Build the Team
- Manage the Team

Lesson 9: Managing Project Procurements
- Plan for Project Procurements
- Obtain Responses from Vendors
- Choose the Right Vendor
- Manage Vendors and Procurements

Lesson 10: Managing Change During Project Execution
- Gear Up for Project Execution
- Manage Project Changes
- Monitor the Project Scope

Lesson 11: Monitoring and Controlling Project Schedule and Cost
- Monitor and Control the Project Schedule
- Optimize the Project Schedule
- Monitor and Control Project Costs

Lesson 12: Monitoring Risk and Quality
- Monitor and Control Risks
- Put Quality Plans into Action
- Control Project Quality

Lesson 13: Communicating and Reporting
- Communicate in a Project
- Distribute Project Information
- Manage Stakeholder Relationships and Expectations
- Report on Project Performance

Lesson 14: Closing the Project
- Hand Off the Project
- Close Project Procurements
- Wrap Up a Project
About this Course

You will apply the generally recognized practices of project management acknowledged by the Project Management Institute (PMI®) to successfully manage projects.

Audience Profile

This course is designed for persons who have on the job experience performing project management tasks, whether or not project manager is their formal job role, who are not certified project management professionals, and who might or might not have received formal project management training. The course is appropriate for these persons if they wish to develop professionally, increase their project management skills, apply a formalized and standards-based approach to project management, seek career advancement by moving into a formal project manager job role, as well as to apply for Project Management Institute, Inc. (PMI®) Project Management Professional (PMP®) Certification.

At Course Completion

Upon successful completion of this course, students will be able to:

- describe professional project management.
- initiate a project.
- plan project work.
- develop project schedules.
- develop cost estimates and budgets.
- plan project quality, staffing, and communications.
- analyze risks and plan risk responses.
- plan project procurements.
- execute project work.
- manage project procurement.
- monitor and control project work.
- monitor and control project schedule and costs.
- monitor and control project performance and quality.
- monitor and control project risks and procurements.
- close the project.

Prerequisites

Familiarity with project management concepts and some working experience with project management are required. Experience with a specific project management software tool is not required.

- Microsoft Word Level 1 is required.
- Project Management Fundamentals is recommended.
## Course Outline

### Lesson 1: Examining Professional Project Management
- Identify Project Management Processes
- Identify Professional and Social Responsibilities
- Identify the Interpersonal Skills Required for a Project Manager

### Lesson 2: Initiating a Project
- Examine the Project Management Context
- Examine Project Selection
- Prepare a Project Statement of Work
- Create a Project Charter
- Identify Project Stakeholders

### Lesson 3: Planning Project Work
- Identify the Elements of a Project Management Plan
- Document Stakeholder Requirements
- Create a Scope Statement
- Develop a Work Breakdown Structure

### Lesson 4: Developing Project Schedules
- Create an Activity List
- Create a Project Schedule Network Diagram
- Estimate Activity Resources
- Estimate Duration for Project Activities
- Develop a Project Schedule
- Identify the Critical Path
- Optimize the Project Schedule
- Establish a Schedule Baseline

### Lesson 5: Developing Cost Estimates and Budgets
- Estimate Project Costs
- Estimate the Cost Baseline
- Reconcile Funding and Costs

### Lesson 6: Planning Project Quality, Staffing, and Communications
- Create a Quality Management Plan
- Document the Project Roles, Responsibilities, and Reporting Relationships
- Create a Communications Management Plan

### Lesson 7: Analyzing Risks and Planning Risk Responses
- Examine a Risk Management Plan
- Identify Project Risks and Triggers
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Develop a Risk Response Plan

### Lesson 8: Planning Project Procurements
- Plan Project Procurements
- Prepare a Procurement Statement of Work
- Prepare a Procurement Document

### Lesson 9: Executing Project Work
- Identify the Direct and Manage Project Execution Process
- Execute a Quality Assurance Plan
- Acquire the Project Team
- Develop the Project Team
- Manage the Project Team
- Distribute Project Information
- Manage Stakeholder Relationships and Expectations

### Lesson 10: Managing Project Procurement
- Examine the Conduct Procurements Process
- Obtain Responses from Sellers
- Determine Project Sellers

### Lesson 11: Monitoring and Controlling Project Work
- Identify the Monitor and Control Project Work Process
- Develop an Integrated Change Control System
- Utilize the Integrated Change Control System
- Review Deliverables and Work Results
- Control the Project Scope

### Lesson 12: Monitoring and Controlling Project Schedule and Costs
- Control the Project Schedule
- Control Project Costs

### Lesson 13: Monitoring and Controlling Project Performance and Quality
- Perform Quality Control
- Report on Project Performance

### Lesson 14: Monitoring and Controlling Project Risks and Procurements
- Monitor and Control Project Risks
- Administer Project Procurements

### Lesson 15: Closing the Project
- Close Project Procurements
- Close the Project or Phase Administratively
About this Course

Java 6 Programming Fundamentals for OO Developers (C++, etc.) is a five-day, comprehensive hands-on workshop geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 6, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development.

At Course Completion

Students who attend Java 6 Programming Fundamentals for OO Developers will leave this course armed with the required skills to develop solid object-oriented applications written in Java, using sound coding techniques and best coding practices. Geared for developers with prior OO development experience in languages such as C++ or SmallTalk, this course will teach students everything they need to become productive in essential Java programming.

Working within a dynamic, hands-on learning environment, guided by our expert team, attendees will learn to:

- Understand not only the fundamentals of the Java language, but also its importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Learn to use Java multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java 6 features and capabilities
- Work with the logging API and framework that is part of the Java platform
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Understand and work with the classes in the concurrent package
- Outline the options for GUI applications in Java
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Throughout the five-day course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review.

Prerequisites

- Working knowledge of object-oriented programming languages such as C++.

Course Outline

Java: A First Look

Lesson - Using the JDK
- Setting Up Environment
- The Development Process
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Applications and Applets

Lesson - Writing a Simple Class
- Classes in Java™
- What Is a Class?
- Defining the Class
- Class Modifiers
- Class Instance Fields
- Instance Fields Diagram
- Primitives vs. Object References
<table>
<thead>
<tr>
<th>Lesson - The Java™ Platform</th>
<th>Lesson - Language Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating Objects</td>
<td>Overloaded Methods Diagram</td>
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<tr>
<td>The main Method</td>
<td>Constructors</td>
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<tr>
<td>Using the Dot Operator</td>
<td>Defining a Constructor</td>
</tr>
<tr>
<td>Writing Output</td>
<td>Optimizing Constructor Usage</td>
</tr>
</tbody>
</table>

**Lesson - The Java™ Platform**
- Defining Java
- Java Provides Several Platforms
- Note on Terminology
- Java SE 6
- Java SE Development Kit (JDK)
- Executing Programs
- Lifecycle of a Java Program
- Responsibilities of JVM
- Java is Dynamic: The Runtime Process
- Primary Areas of the JVM Runtime
- Garbage Collection
- Documentation and Code Reuse
- JavaDoc Provides Documentation Delivery
- In-Line Comments are Translated into HTML Rendering
- Working with Java in Your Environment

<table>
<thead>
<tr>
<th>Session</th>
<th>Lesson - Using Strings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-Oriented Concepts In Java</td>
<td>Strings</td>
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<tr>
<td>Lesson - Object-Oriented Programming</td>
<td>String Method</td>
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<tr>
<td>The Object Oriented Way</td>
<td>String Equality</td>
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<tr>
<td>Real-World Objects</td>
<td>StringBuffer</td>
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<tr>
<td>Classes and Objects</td>
<td>Strings, StringBuffer, and StringBuilder</td>
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<tr>
<td>Examples of Classes and Objects</td>
<td>StringTokenizer</td>
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<tr>
<td>Classes and Objects Diagram</td>
<td>Scanner</td>
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<tr>
<td>Object Behavior</td>
<td>Scanner - File Source</td>
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<tr>
<td>Methods and Messages</td>
<td>Scanner - Getting Input</td>
</tr>
</tbody>
</table>

**Lesson - Inheritance, Abstraction, and Polymorphism**
- Encapsulation
- Inheritance
- Method Overriding
- Aggregation
- Type Abstraction - Grouping as Supertype
- Polymorphism
- Polymorphism Diagram

**Lesson - Specializing in a Subclass**
- Extending a Class
- The extends Keyword
- Casting
- Overriding Superclass Methods
- Method Overriding Diagram
- Calling Superclass Methods from Subclass
- The Object Class
- The equals Method
- Default Constructor
- Implicit Constructor Chaining
- Passing Data Up Constructor Chain
- A Common Programming Mistake
- Editing Tools in Your IDE

**Session**
**Getting Started with Java™**

**Lesson - Adding Methods to the Class**
- Instance Methods
- Passing Parameters Into Methods
- Returning a Value From a Method
- Overloaded Methods

**Session**
**Essential Java™ Programming**

**Lesson - Fields and Variables**
- Fields vs. Variables
- Data Types
Lesson - Using Arrays

- Arrays
- Accessing the Array
- Multidimensional Arrays

Lesson - Static Methods and Fields

- Static Fields
- Simple Example of Static Fields
- Static Methods
- Lesson - Java™ Packages
- The Problem
- Packages
- Class Location of Packages
- The Package Keyword
- Importing Classes
- Executing Programs
- Visibility
- Java Naming Conventions
- Packages Diagram
- Refactoring in Your IDE

Session

Advanced Java™ Programming

Lesson - Inheritance and Polymorphism

- Polymorphism
- Polymorphism: The Subclasses
- Treating Derived Classes as the Superclass
- Casting to the Derived Class
- Using instanceof For Downcasting
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

Lesson - Interfaces and Abstract Classes

- Separating Capability from Implementation
- Abstract Classes
- Shape as an Abstract Class
- Polymorphism With Abstract Classes
- Interfaces
- Implementing an Interface
- Extending Interfaces
- Polymorphism With Interfaces
- Type Checking
- Abstract Classes vs. Interfaces

Lesson - Exceptions

- What is an Exception?
- Exception Architecture
- Handling Exceptions
- The Throwable Class
- The try Block
- The catch Block
- The finally Block
- Full Example of Exception Handling
- Generalized vs. Specialized Exceptions
- Overriding Methods
- Creating Your Own Exceptions
- Throwing Exceptions
- Re-throwing an Exception
- Checked vs. Unchecked Exceptions
- Debugging in Your IDE

Session

Java™ Developer's Toolbox

Lesson - Utility Classes

- Wrapper Classes
- The Number Class
- Numbers and Strings
- Big Decimal
- Random Numbers
- Decimal Formatting
- The Date Class

Lesson - Vector and Hashtable

- The Vector Class
- Creating and Using a Vector
- Java Collections Methods in Vector
- Hashtables
- Understanding How Hashing Works
- Creating and Using a Hashtable
- Performing Lookups

Lesson - Collections

- The Collections Framework
- Collections Feature Types
- Collections Interface Hierarchy
- Map Interfaces
- Optional Methods
- The Collection Interface
- Iterators
- The Set Interface
- SortedSet
- Set and SortedSet Example
Comparable and Comparator
The List Interface
List Example
ListIterator
Queue Interface
QueueExample
BlockingQueue
BlockingQueue Implementations
Collections Utility Methods
Features of the Implementation Classes
Synchronization Wrappers
Feature Comparison
Using the Right Collection
Use of Collections vs. Vector/Hashtable
Optimizing Collection Constructors
Copying Arrays
Creating and Using an Arraylist
Creating and Using a HashMap

Lesson - Generics
Generics and Parametric Polymorphism
Simple Generics
The Mechanics of Generics
Generics and Subtyping
Compiler Restrictions on Generics and Subtyping
Generics as Arguments in Methods
Rationale Behind Wildcards
Wildcards In Use
Regular Wildcards in Method Parameters
Bounded Wildcards
Standard Rules Apply
Generic Methods
Interoperability with Legacy Code
Raw Types
Legacy Calls To Generics
When Generics Should Be Used
Build Paths in Your IDE

Lesson - Overview of Java GUIs
JFC - Java Foundation Classes
Categories of Classes in JFC
Creating the Frame
Adding Content to a Frame
A Closer Look at Layout Managers
BorderLayout
JFC Provides an Event Handling Structure

Lesson - Autoboxing, Enhanced for Loop and Varargs
Autoboxing/Unboxing
Autoboxing/Unboxing Issues

- For() Loops and Collections
- The Enhanced for() Loop
- Another Example - Problematic
- Another Example - Enhanced for()
- Enhanced for() Loop Restrictions
- Previous Variable Argument Support
- Variable Arguments in Java SE 1.5
- Varargs rules
- Issues

Lesson - Enumerations and Static Imports
Rationale for Enumerations
Enumeration Syntax
Enumerations Methods
Enumerations as a Better Class Type
Enumeration Code
EnumSet
EnumMap
When You Should Use Enumerations
Using Static Imports
When You Should Use Static Imports

Lesson - Inner Classes
Defining Inner Classes
Member Inner Classes
Local Inner Classes
Anonymous Inner Classes
Anonymous Subclassing

Lesson - Multithreading
Principles of Multithreading
Creating a Threaded Class
Creating a Threaded Class Using Runnable
Example: Threaded Class
Example: Runnable Class
Basic Features of the Thread Class
Daemon Threads
Thread Scheduling
Signaling a Thread
Sleeping
Thread Synchronization
Synchronized Methods
Synchronized Block
Object Synchronization

Lesson - Java I/O
The Java I/O Mechanism
Byte Level I/O
Subclasses Accessing Real Data
Filter Classes
Lesson - Introduction to Annotations

- Annotations Overview
- Working with Java Annotations
- Example of Using @Override
- Annotations are Heavily Used in Many Technologies
- Declaring Persistence in Hibernate

Session
Java™ Application Development

Lesson - File System Access

- The File Class
- File Utility Methods
- RandomAccessFile
- Byte-Based File Access
- Text-Based File Access
- FileReader Diagram

Lesson - Networking

- Socket Programming Fundamentals
- Communicating on a Socket
- Single-Threaded Server Performance
- Creating a Threaded Server
- Sending and Receiving Objects
- Useful Methods

Lesson - JDBC™

- What is JDBC?
- Structured Query Language (SQL)
- Connecting to the Database
- Statements
- Statement and PreparedStatement
- ResultSet
- JDBC Diagram
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency

Lesson - Java Logging

- Why Logging?
- Logging Framework
- Loggin in Java
- Java Logging Framework
- The Logger Class
- Global Configuration
- Logging Levels
- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

Lesson - New In Java 6

- Java 6 - Performance
- Java 6 - Security Improvements
- Java 6 - Web Services Improvements
- Java 6 - Development
- Java 6 - GUI
- Java 6 - Compression
- Java 6 - Collection Interfaces
- Java 6 - Concrete Implementation
- Java 6 - Retrofitted
- Java 6 - More on Collection
- Java 6 - I/O
- Java 6 - Internationalization
- The JAXB Difference

Lesson - Reading Stream as Data Primitives

- Adding Buffering for Better Performance
- Writing Buffered Data to a File
- Character Level I/O
- Subclasses Accessing Real Data
- Reader/Writer Filter Classes
- Serialization
- Switching Java Versions in Your IDE

Lesson - Mapping SQL Types to Java Types

- Database Connection Via JDBC Calls
- Rationale for Connection Pooling
- Connection Pooling in JDBC
- Database Connection Using a DataSource
- Stored Procedures Defined
- Callable Statement Syntax
- Stored Procedure Parameters
- RowSet Implementations
- JDBCRowSet
- JDBCRowSet Approach
- JDBCRowSet - Retrieving Data
- JDBCRowSet Example
- CachedRowSet
- CachedRowSet Approach
- CachedRowSet Example

Lesson - Java™ Application Development

Lesson - File System Access

- The File Class
- File Utility Methods
- RandomAccessFile
- Byte-Based File Access
- Text-Based File Access
- FileReader Diagram

Lesson - Networking

- Socket Programming Fundamentals
- Communicating on a Socket
- Single-Threaded Server Performance
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- Sending and Receiving Objects
- Useful Methods

Lesson - JDBC™

- What is JDBC?
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- Global Configuration
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- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

Lesson - New In Java 6

- Java 6 - Performance
- Java 6 - Security Improvements
- Java 6 - Web Services Improvements
- Java 6 - Development
- Java 6 - GUI
- Java 6 - Compression
- Java 6 - Collection Interfaces
- Java 6 - Concrete Implementation
- Java 6 - Retrofitted
- Java 6 - More on Collection
- Java 6 - I/O
- Java 6 - Internationalization
- The JAXB Difference
Developing JEE (Java EE) Applications using Servlets/JSPs, JDBC and More
Course#: TT5100

Length: 5 days
Audience: Developers
Technology: Sun Java EE
Type: Day Course
Delivery Method: Instructor-Led Classroom

About this Course

This is a five-day in-depth course geared for software developers who need to understand what J2EE is, what it means in terms of today's systems and architectures, and how to apply basic Servlets and JSPs in implementing and deploying robust, flexible web applications.

Java 2, Enterprise Edition (J2EE) is a powerful platform for building web applications. The J2EE platform offers all the advantages of developing in Java plus a comprehensive suite of server-side technologies. This course tells you what you need to know to design and build your own web applications. You'll learn the details of the key J2EE technologies and how to leverage the strengths of each, with special focus on Servlets and JSPs. At the same time, you'll be learning about the big picture of J2EE and how to design web applications that are robust, efficient, secure, and maintainable. If you want to deliver an application on the web, you'll find this course essential.

At Course Completion

Students who attend Building J2EE Web Applications using Servlets/JSPs & JDBC will leave the course armed with the required skills to build basic web applications.

- Design and build robust, secure, and maintainable web applications
- Access databases with JDBC
- Create dynamic HTML content with Servlets and Java Server Pages
- Make Servlets and JSP work together cleanly
- Use JSP 2.0, EL, and JSTL to separate Java and HTML code

Prerequisites

- Working knowledge of object-oriented programming languages such as C++

Course Outline

Session: J2EE Application Architecture

Technical Overview of J2EE

- What is J2EE?
- Common Themes In J2EE Framework
- J2EE Containers and Components
- Servlets
- Java Server Pages (JSP)
- EJBs and Web Services
- J2EE Containers
- J2EE Application Modules
- The J2EE 1.4 Specification
- J2EE Platform Roles

J2EE Application Architectures (web based)

- J2EE and the Web
- J2EE 1st Generation DB-centric Web Application
- Adding JSPs to Separate Presentation

- Eliminating Java code from view
- The Model 2 Architecture
- Using EJBs
- J2EE Infrastructure Supporting Web Applications Lesson Review

Session: Web Applications

Understanding Web Applications

- J2EE Application Modules
- The Truth about Archives
- Enterprise Application Archive (EAR)
- Enterprise JavaBean Archive (JAR)
- J2EE Application Client (JAR)
- Resource Adapter Archive (RAR)
- Web Application Archive (WAR)
- Directory Structure

Configuring Web Applications

- Mapping an HTTP Request to a Resource
TT5100: Developing JEE (Java EE) Applications using Servlets/JSPs, JDBC and More

COURSE OUTLINE

- The web.xml File
- Structure
- Declaring Servlets and JSPs
- Servlet Mapping
- Servlet Init Parameters
- Web Application init Parameters
- Welcome Page
- Error Page

Session: Developing Servlets

Introduction to Servlets
- Servlet Overview
- Life Cycle of Servlets
- Servlet Lifecycle is Handled by Web Container
- HttpServlet
- Writing the init Method
- HttpServletResponse
- HttpServlet Request Methods
- ServletRequest
- HttpSession
- Session Init Parameters
- Return a Status Code
- Building the Output Document
- Sending Binary Content

Processing Input Data
- Form Processing with Servlets
  - HTML Form
  - LoginServlet doPost

Server-Side Control
- Request Dispatcher
- Forward the processing
- Passing Processing on and Getting it Back
- Servlet Runs Within Web Container Environment
- Several Options for Receiving Data
- Init Parameters and Attributes
- ServletConfig; ServletContext
- Servlet Variables are Scoped
- HTTP Request Information
- Several Options for Sharing Data
- Configuration and Context
- Servlet Variables
- HttpServletResponse
- Threading and Data
- Threading and Data 2

Client Side Control
- Output Buffering

- Setting Status Codes; Setting Headers
- sendRedirect
- Disabling Client Caching
- Supporting Persistent Connections
- Setting Content Length
- Dynamic Content Pushing

Maintaining Client State (Sessions)
- Session Management
- Tracking Problem – Stateless HTTP
- Data Problem – Session Data
- Solving the Tracking Problem
- Cookies
- Cookie Behavior; Retrieving Cookies
- servlet to set Cookies
- Servlet to Show Cookies
- URL Rewriting
- Solving the Data Problem
  - iWeb Container Manages Session Instances
  - Sessions with Cookies
  - Cookie-Based Sessions
  - Basic Session Implementation
  - Cookie Detection is not Standardized
  - Cookie-Based Sessions
- Session with URL Rewriting

Application and Session Events
- Event Listener Model
- Life Cycle Events in a Web-Application
- Declare the Listener
- Type of Events
- Context Listeners; Session Listeners
- Session Listeners for Session-Objects

Session Filters

Overview of Filters
- iWhat is a Filter
- Single Filter
- Filter Objects
  - doFilter Method
  - init Method
  - Filter Life Cycle
  - Cascading Filters

Filtering Requests and Responses
- Request Wrapper
- Process the Request
- Examples of Request Filters
  - Filter the Response
  - Response Wrapper
### Session: Developing JavaServer Pages

**Introduction to JavaServer Pages**
- Separating Presentation from Model
- Java Server Page (JSP): An Extension of Servlet
- Lifecycle of a JSP
- Example JSP
- JSP Syntax Consists of Three Types
- JSP Scripting: Declarations; Expressions; Scriptlets & Directives
  - The session Attribute
  - The errorPage/isErrorPage Attribute
  - JSP Actions
  - JSP Actions: Include/Forward
- Typical JSP Access Model
  - JSP Action: useBean
  - Implicit Objects
  - JSPs or Servlets

**JSP Implicit Objects**
- Implicit Objects
  - Page Object; Config Object
  - Request Object; Response Object
  - Out Object
  - Output Buffer
  - Session Object
  - Application Object
  - PageContext Object
- Attributes
- Session Attributes
- Exception Handling

**Actions, Java Beans, and Custom Tags**
- Standard Actions
- Forwarding; Including
- Using JavaBeans® and JSP
- Declaring to use a Bean
- Using a Bean, Example
- Setting and Getting Properties
- What are Custom Tags?
- Create and Use a Custom TagLib

### The Expression Language
- The Expression Language
- The Expression Language (JSP 2.0)
- Enable/Disable EL
- Variables
- Literals and Operators in the JSP EL
- Implicit Objects in JSP EL
- Reserved Words
- EL Functions
  - Developing the Function
  - Declaring the Function in the TLD
  - Using the Function
  - Pre-Built EL Functions

### Session: JSTL 1.1

**JSTL Introduction and Core Library**
- Introduction to JSTL
- Expression Language (EL) in JSTL
- Review of JSP Bean Tags
- Tag Collaboration
  - JSTL Core
  - &lt;c:choose&gt;&lt;c:when&gt; &lt;c:otherwise&gt;
  - &lt;c:if&gt; &lt;c:import&gt; &lt;c:forEach&gt; &lt;c:forTokens&gt; &lt;c:out&gt;
  - &lt;c:param&gt;&lt;c:catch&gt;&lt;c:redirect&gt; &lt;c:remove&gt; &lt;c:set&gt;
- Using c:set to pass HTML
- &lt;curl&gt;

**JSTL Format Library**
- JSTL Format
  - &lt;fmt:requestEncoding&gt; &lt;fmt:setLocale&gt; &lt;fmt:timeZone&gt;
  - &lt;fmt:setTimeZone&gt; &lt;fmt:bundle&gt; &lt;fmt:setbundle&gt; &lt;fmt:message&gt;
  - &lt;fmt:formatNumber&gt; &lt;fmt:parseNumber&gt;
  - &lt;fmt:formatDate&gt; &lt;fmt:parseDate&gt;

**JSTL SQL Library**
- JSTL SQL
  - &lt;sql:query&gt; &lt;sql:update&gt; &lt;sql:transaction&gt; &lt;sql:param&gt;
  - &lt;sql:dateParam&gt;

**JSTL XML**
- JSTL XML
  - &lt;x:choose&gt; &lt;x:when&gt; &lt;x:otherwise&gt;
  - &lt;x:if&gt; &lt;x:import&gt; &lt;x:forEach&gt; &lt;x:forTokens&gt; &lt;x:parse&gt; &lt;x:set&gt;
  - &lt;x:transform&gt; &lt;x:param&gt;
- Simple Tag Handlers
- Tag Files
Simple Tag Handlers
- Tag File Location
- Tag-Files Outside of a Library
- Tag Library Descriptors
- The TLD File
- The <tag-file> Element
- Tag File with Attributes
- jsp:attributeElement
- Using Attributes
- jsp:doBody
- jsp:invoke

Session: Database Integration: JDBC and J2EE

JDBC and Its Position in J2EE
- JDBC Versions
- The JDBC API
- JDBC in J2EE
- Programming with DataSources
- JNDI names
- DataSource Programming Best Practices

JDBC Data Access API
- Structured Query Language (SQL)
- Statements & Statement
- PreparedStatement
- ResultSet
- Executing Inserts, Updates, and Deletes
- Mapping SQL Types to Java Types
- CallableStatement

The DAO Pattern
- Data Access Object (DAO)
- DAO Structure
- DAO Example: ProductDAO
- The DAOFactory
- Complete UML Diagram
- Using the ProductDAO

Session: Additional J2EE Components

Working With Enterprise JavaBeans"
- Defining Enterprise JavaBeans
- JavaBeans" vs EJBs
- EJB Architecture Overview
- EJB Container & Types of EJBs
- Enterprise Bean; Session Beans
- Entity Beans
- Message-Driven Bean
- EJBObject/EJBLocalObject

Web Services in J2EE – WSEE
- What are WebServices?
- Web Services Architecturally
- XML and Web Service APIs
- Web Services for J2EE - WSEE
- Servlets as Web Services
- EJBs as Web Services
- Routing SOAP requests to an EJB
- WSDD

Session: Security

J2EE Security
- Typical J2EE App Server Security Services
- Java 2 Platform Security Model
- Java 2 Security in J2EE
- JAAS Authentication: Who are you?
- J2EE Security Overview
- Authorization: Are you allowed access?
- High-Level Trace of J2EE Authorization
- Deployment Descriptors Play a Large Role
- Declaring Secure Resources
- Declaring the security roles
- Typical J2EE App Server Security Services
- Security on the Web; Secure Web Traffic
- SSL In Action
- Responsibilities For Security
- CMS: Declaring HTTPS
- Authentication Challenge Mechanisms

Web Application Security Overview
- Attacks are Constant and Changing
- Open Web ApplicationSecurity Project
- Assets are the Targets
- The Context for DefensiveCoding
- Attackers Not Hackers
- Cross-Site Scripting (XSS): Description
- Defending Against XSS Attacks
- SQL Injection: Description; Example & Drill Down
- Defending Against SQL Injection Attacks

Handling Untrusted Input
- Unvalidated Input: Description
- Protecting a Web Resource
- Defending a Web Application
- Defending a Web Application/Resource
- Responding to Error State
### Best Practices for Untrusted Data
- Additional Types of Attacks

### Session: Additional J2EE Topics

#### Transactions
- Transaction Definitions
- The ACID Transaction Properties
- Transaction Lifecycle
- Overview of a Transactional System
- J2EE Transaction Support

#### Other J2EE APIs
- Java Message Service (JMS)
- When is Messaging Used?

#### COURSE OUTLINE

- Two Messaging Models
- More On Publish/Subscribe
- Logical View of Publish/Subscribe
- More On Point-to-Point (P2P)
- Logical View of Point-To-Point
- Message Servers
- JavaMail; JavaMail Architecture
- XML
- An XML Document
- J2EE and XML

#### The J2EE Blueprints
- Overview
- Key Resources
About this Course

Students will learn the basic skills necessary to understand the structure of the UNIX operating system and to use the available utilities and commands to manage file structures in AIX UNIX. Students will also learn more advanced skills to understand the AIX UNIX environment and features.

At Course Completion

After completing this course, students will be able to:

* Understand the basic features available in UNIX, and briefly understand its history and evolution.
* Log in and log out, change their password, and understand some basic UNIX commands and the UNIX command syntax: `command - option argument`.
* Use the mail utility and the talk utility.
* Understand full paths, partial paths, current working directory, and the concept of home directory.
* Create directories, copy and move files, and remove files and directories.
* Secure files and directories by the use of permissions.
* Combine several UNIX utilities to create new utilities that accomplish specific tasks.
* Create and edit a `vi` file.
* Create "custom" commands that can be run from the prompt.
* Explore the different UNIX shells available, such as the Bourne, C, and Korn Shells.
* Work with a user-defined interface, and modify existing files and create files that customize their user interface.
* Use the alias command, assign an alternate name to a command, and create user-defined commands.
* Understand the components that comprise the C-Shell history feature, and perform a complete installation of the history program by modifying and adding the necessary commands and assignments.
* Determine their user and terminal status, use commands to determine who else is on a system and some of their system attributes, and determine the location of commands that are available to users.
* Use multi-tasking to manage processes.
* Use the find command to search for files and directories that meet a criterion defined by them.
* Use file compression and restoration, the `tar` command, and the `pr` and `lpr` commands.
* Use the `tr`, `sed`, and `awk` commands to modify and manage file contents, to create files, or to output streams.

Course Outline
Module 1: Getting Started with Unix
- Accessing a Unix System
- Connecting to the Unix System
- Logging In
- Changing Your Password with passwd
- Listing Directories and Files with ls
- Changing Directories with cd
- Finding Yourself with pwd
- Piping Input and Output
- Redirecting Output
- Using wildcards
- Viewing File Contents with more
- Displaying File Contents with cat
- Exploring the System
- Getting Help with man
- Logging Out

Module 2: Using Directories and Files
- Creating Directories with mkdir
- Creating Files with touch
- Copying Directories and Files with cp
- Listing Directories and Files with ls
- Moving Files with mv
- Removing Files with rm
- Removing Directories with rmdir
- Finding Forgotten Files with find
- Locating Lost Files with locate
- Linking with ln (Hard Links)
- Linking with with ln-s (Soft Links)

Module 3: Working with Your Shell
- Discovering Which Shell You’re Using
- Understanding Shells and Options
- Changing Your Shell with chsh
- Changing Your Shell Temporarily
- Using Completion in the bash Shell
- Viewing Session History in zsh Shell
- Changing Your Identity with su
- Fixing Terminal Settings with stty
- Exiting the Shell

Module 4: Creating and Editing Files
- Choosing an Editor
- Starting pico and Dabbling with It
- Saving in pico
- Cutting and Pasting Text Blocks in pico
- Check spelling in pico
- Getting Help in pico
- Exiting pico
- Starting vi and Dabbling with It
- Saving in vi
- Adding and Deleting Text in vi
- Importing Files into vi
- Searching and Replacing in vi
- Exiting vi
- Starting emacs and Dabbling with It
- Using emacs Menus to Spell Check
- Saving in emacs
- Exiting emacs

Module 5: Controlling Ownership and Permissions
- Understanding File Ownership and Permissions
- Finding Out Who owns What
- Finding Out Which Group You’re In
- Changing Ownership of Files and Directories with chown
- Directories with chown
- Changing Permissions with chmod
- Translating Mnemonic Permissions to numeric Permissions

Module 6: Manipulating Files
- Counting Files and Their Contents with wc
- Viewing File Beginnings with head
- Viewing File Endings with tail
- Finding Text with grep
- Using regular Expressions with grep
- Using Other Examples of Regular Expressions
- Making Global Changes with sed
- Regular Expressions
- Making Global Changes with sed
- Changing Files with awk
- Comparing Files with cmp
- Finding Differences in Files with diff
- Finding Differences in Files with sdiff
- Sorting Files with sort
- Eliminating duplicates with uniq
- Redirecting to Multiple Locations with tee
- Changing with tr
- Formatting with fmt
- Splitting Files with split

Module 7: Getting Information About the System
- Getting System Information with u name
- Viewing File Systems with df
- Determining Disk Usage with du
- Finding Out File Types with file
- Finding Out About Users with finger
- Learning Who Else Is Logged in with Who
- Learning Who Else is Logged in with W
- Getting Information About Your Userid with id
Module 8: Configuring Your Unix Environment
- Understanding Your Unix Environment
- Discovering Your Current Environment
- Adding or Changing Variables
- Looking at Your zsh Configuration Files
- Adding to Your bash Path
- Changing Your bash Prompt
- Setting Aliases with alias

Module 9: Running scripts and Programs
- Running a Command
- Scheduling Onetime Jobs with at
- Scheduling Regularly Occurring Jobs with cron
- Suspending Jobs
- Checking Job Status with jobs
- Running Jobs in the Background with bg
- Running Jobs in the Foreground with fg
- Controlling Job Priority with nice
- Timing Jobs with time
- Finding Out What Processes Are Running with ps
- Deleting Processes with Kill

Module 10: Writing Basic Scripts
- Creating a Shell Script
- Running a Shell Script
- Making a Script Executable
- Getting a Head Start on Scripts with history
- Embedding Commands
- Looping Your Scripts
- Creating If-Then Statements
- Accepting Command-Line Arguments in Your Scripts
- Accepting Input While a Script Is Running
- Debugging Scripts

Module 11: Sending and Reading E-mail
- Choosing an E-mail Program and Getting Started
- Reading E-mail with pine
- Sending E-mail with pine
- Customizing pine
- Reading E-mail with mutt
- Sending E-mail with mutt
- Reading E-mail with mail
- Sending E-mail with mail
- Creating a Signature File
- Automatically Forwarding Incoming Messages
- Announcing an Absence with vacation
- Configuring procmail
- Managing E-mail with procmail

Module 12: Accessing the Internet
- Getting Familiar with Unix Internet Lingo
- Logging in to Remote Systems with ssh
- Logging in to Remote Systems with telnet
- Communicating with Others using write
- Communicating with Others using talk
- Getting Files from the Internet with ftp
- Sharing Files on the Internet with ftp
- Surfing the Web with links
- Surfing the Web with lynx
- Downloading Web Sites with wget
- Checking Connections with ping
- Tracing Connections with traceroute
- Matching Domain Names with IP Addresses

Module 13: Working with Encoded and Compressed Files
- Encoding Files with uuencode
- Decoding Files with uudecode
- Archiving with tar
- Unarchiving Files with tar
- Compressing Files with compress
- Uncompressing Files with uncompress
- Zipping a File or Directory with gzip
- Unzipping a gzip File with gunzip
- Zipping Files and Directories with zip
- Unzipping Zipped Files with unzip
- Combining Commands

Module 14: Using Handy Utilities
- Calendaring with cal
- Calculating with bc
- Evaluating Expressions with expr
- Converting with units
- Looking It Up with look
- Keeping a Record of Your Session with script

Module 15: Being Root
- Acting Like root with sudo
- Becoming root with su
- Starting, Stopping, and Restarting Daemons
- Changing the System Configuration
- Monitoring the System
- Keeping up with watch
- Checking Boot Messages with dmesg
- Setting the Date and Time

Module 16: Sensational Unix Tricks
- Cleaning Up HTML Documents with tidy
- Searching and Replacing Throughout Multiple Documents with sed
- Generating Reports with awk
<table>
<thead>
<tr>
<th>UNIX-1001: Unix/AIX Visual QuickStart</th>
<th>COURSE OUTLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Using Input to Customize Your Environment</td>
<td>● Making Backups with rsync</td>
</tr>
<tr>
<td>● Using ROT13 Encoding with sed</td>
<td>● Using Advanced Redirection with stderr</td>
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<tr>
<td>● Embedding ROT13 Encoding in a Shell Script</td>
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</table>
Cisco Certified Network Associate Wireless (CCNA Wireless) recognizes the critical importance of professionals supporting wireless LANS including Networking Associates/Administrators, Wireless Support Specialists and WLAN project managers. CCNA Wireless validates associate-level knowledge and skills to configure, implement and support of wireless LANs, specifically those networks using Cisco equipment. With a CCNA Wireless certification, network professionals can support a basic wireless network on a Cisco WLAN in a SMB to enterprise network. The CCNA Wireless curriculum includes information and practice activities to prepare them for configuring, monitoring and troubleshooting basic tasks of a Cisco WLAN in SMB and Enterprise networks.

**About this Course**

**Prerequisites**

- Valid Cisco CCNA or any Cisco CCIE certification can act as a prerequisite.

**At The Course Completion**

**Describe WLAN fundamentals**

- Describe basics of spread spectrum technology
- Describe the impact of various wireless technologies (Bluetooth, WiMAX, ZigBee, and cordless phone)
- Describe wireless regulatory bodies, standards and certifications (FCC, ETSI, 802.11a/b/g/n, and WiFi Alliance)
- Describe Wireless LAN (WLAN) RF principles (antenna types, RF gain/loss, Effective Isotropic Radiated Power (EIRP), refraction, reflection, and so on)
- Describe networking technologies used in wireless (SSID to WLAN_ID to Interface to VLAN, 802.1q trunking)
- Describe wireless topologies, such as Independent Basic Service Set (IBSS), Basic Service Set (BSS), Extended Service Set (ESS), Point-to-Point, Point-to-Multipoint, Mesh, and bridging)
- Describe 802.11 authentication and encryption methods (Open, Shared, 802.1X, EAP, TKIP, and AES)
- Describe frame types (associated and unassociated, management, control, and data)
COURSE OUTLINE

- Describe basic RF deployment considerations related to site survey design of data or VoWLAN applications, common RF interference sources such as devices, building material, AP location, and basic RF site survey design related to channel reuse, signal strength, and cell overlap

Install a basic Cisco wireless LAN
- Identify the components of the Cisco Unified Wireless Network architecture (Split MAC, LWAPP, stand-alone AP vs controller-based AP, specific hardware examples)
- Install and configure autonomous access points in the small business environment
- Describe the modes of controller-based AP deployment (local, monitor, HREAP, sniffer, rogue detector, bridge, OEAP, and SE-Connect)
- Describe controller-based AP discovery and association (DHCP, DNS, Master-Controller, Primary-Secondary-Tertiary, and n+1 redundancy)
- Describe roaming (Layer 2 and Layer 3, intra-controller and inter-controller, and mobility list)
- Configure a WLAN controller and access points WLC: ports, interfaces, WLANs, NTP, CLI and Web UI, CLI wizard, and link aggregation group (LAG) AP: Channel and Power
- Describe Radio Resource Management (RRM) fundamentals including ED-RRM.
- Verify basic wireless network operation

Install Wireless Clients
- Describe client WLAN configuration requirements, such as Service Set Identifier (SSID), security selection, and authentication
- Identify basic configuration of common wireless supplicants (Macintosh, Intel Wireless Pro, Windows, iOS, and Android)
- Describe basic AnyConnect 3.0 or above wireless configuration parameters
- Identify capabilities available in CCX versions 1 through 5

Implement basic WLAN Security
- Describe the general framework of wireless security and security components (authentication, encryption, MFP, IPS)
- Describe and configure authentication methods (Guest, PSK, 802.1X, WPA/WPA2 with EAP-TLS, EAP-FAST, PEAP, LEAP)
- Describe and configure encryption methods (WPA/WPA2 with TKIP, AES)
- Describe and configure the different sources of authentication (PSK, EAP-local or-external, Radius)

Operate basic WCS
- Identify key functions of Cisco Wireless Control System (WCS) and Navigator (versions and licensing)
- Navigate WCS interface
- Configure controllers and access points (APs) (using the Configuration tab not templates)
- Use preconfigured maps in the WCS (adding/relocating/removing access points, turn on/off heat maps, view client location, and view CleanAir zones of influence)
- Use the WCS monitor tab and alarm summary to verify the WLAN operations
- Generate standard WCS reports (inventory, CleanAir, client-related, AP-related, and utilization)

Conduct basic WLAN Maintenance and Troubleshooting
- Identify and use basic WLAN troubleshooting tools (WLC show debug and logging) for client to AP connectivity, AP to controller connectivity
- Use the WCS client troubleshooting tool
- Transfer logs, configuration files, and O/S images to and from the WLC via the GUI
• Differentiate and use WLC and AP (autonomous and LAP) management access methods (console port, CLI, telnet, ssh, http, https, and wired vs wireless management)

Required Exams

The Implementing Cisco Unified Wireless Network Essential (IUWNE) exam is the exam associated with the CCNA Wireless certification (640-722 IUWNE).
CISCO CCNA Voice Boot Camp

About this Course

The Cisco Certified Network Associate Voice (CCNA Voice) validates associate-level knowledge and skills required to administer a voice network. The Cisco CCNA Voice certification confirms that the required skill set for specialized job roles in voice technologies such as voice technologies administrator, voice engineer, and voice manager. It validates skills in VoIP technologies such as IP PBX, IP telephony, handset, call control, and voicemail solutions.

The CCNA Voice certification assesses skills and knowledge related to the Cisco Unified Communications Manager. It is typically employed by large organizations such as governments, large companies, and colleges. Additionally, the CCNA Voice Certification assesses skills and knowledge related to the Cisco CallManager Express (CME) and Cisco Unity Express (CUE) solutions typically used by medium and small organizations such as companies with less than 2,000 employees, retail businesses, and small school districts.

Prerequisite

Cisco CCNA Routing and Switching or the following knowledge and skills:

- Working knowledge of converged voice and data networks
- Basic knowledge of Cisco IOS gateways
- Basic knowledge of Cisco Unified Communications Manager and Cisco Unity Connection

Required Exam

Introducing Cisco Voice and Unified Communications Administration (640-461 ICOMM)

Course Content

Introducing Cisco Voice and Unified Communications Administration (ICOMM) v8.1 teaches learners how to maintain and operate a Cisco Unified Communications solution that is based on Cisco Unified Communications Manager, Cisco Unified Communications Manager Express, Cisco Unity Connection, and Cisco Unified Presence. This course provides the learners with the knowledge and skills to achieve associate-level competency in Cisco Unified Communications.

Course Outline

Part 1 Voice Perspectives

Chapter 1 Traditional Voice Versus Unified Voice
“Do I Know This Already?”
Foundation Topics
Where It All Began: Analog Connections
The Evolution: Digital Connections
   Moving from Analog to Digital
   Channel Associated Signaling
   Common Channel Signaling
Understanding the PSTN
   Pieces of the PSTN
   Understanding PBX and Key Systems
   Connections to and Between the PSTN
   PSTN Numbering Plans
The New Yet Not-So-New Frontier: VoIP
   VoIP: Why It Is a Big Deal for Businesses
   The Process of Converting Voice to Packets
   Role of Digital Signal Processors
   Understanding RTP and RTCP
Exam Preparation Tasks
   Review All the Key Topics
   Definitions of Key Terms

Chapter 2 Understanding the Pieces of Cisco Unified Communications
“Do I Know This Already?”
Foundation Topics
Did Someone Say Unified?
Understanding Cisco Unified Communications Manager Express
   CME Key Features
   CME Interaction with Cisco IP Phones
   A Match Made in Heaven: CME and CUE
Understanding Cisco Unified Communications Manager
   CUCM Key Features
   CUCM Database Replication and Interacting with Cisco IP Phones
Understanding Cisco Unity Connection
   Cisco Unity Connection Key Features
   Cisco Unity Connection and CUCM Interaction
Understanding Cisco Unified Presence
   Cisco Unified Personal Communicator
Exam Preparation Tasks
   Review All the Key Topics
   Definitions of Key Terms

Chapter 3 Understanding the Cisco IP Phone Concepts and Registration
“Do I Know This Already?” Quiz
Foundation Topics
Connecting and Powering Cisco IP Phones
   Cisco Catalyst Switch PoE
   Powering the IP Phone Using a Power Patch Panel or Coupler
COURSE OUTLINE

Powering the IP Phone with a Power Brick
VLAN Concepts and Configuration
  VLAN Review
  VLAN Trunking/Tagging
  Understanding Voice VLANs
  VLAN Configuration
Understanding the Cisco IP Phone Boot Process
Configuring a Router-Based DHCP Server
Setting the Clock of a Cisco Device with NTP
IP Phone Registration
Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms

Part II Managing Endpoints and End Users

Chapter 4 Getting Familiar with CME Administration
“Do I Know This Already?”
  Foundation Topics
  Managing CME Using the Command Line
  Managing CME Using a Graphic User Interface
Exam Preparation Tasks
  Review All the Key Topics

Chapter 5 Managing Endpoints and End Users with CME
“Do I Know This Already?”
  Foundation Topics
  Ensuring the Foundation
    Voice VLAN
    DHCP Services
    TFTP Services
    Base CME Configuration
  Ephone and Ephone-DN—The Keys to Ringing Phones
    Understanding and Configuring Ephone-DNs
    Understanding and Configuring Ephones
    Associating Ephones and Ephone-DNs
  Adding Directory Numbers, Phones, and Users with CCP
Exam Preparation Tasks
  Review All the Key Topics

Chapter 6 Understanding the CME Dial-Plan
“Do I Know This Already?”
  Foundation Topics
  Configuring Physical Voice Port Characteristics
    Configuring Analog Voice Ports
    Foreign Exchange Station Ports
    Foreign Exchange Office Ports
Configuring Digital Voice Ports
Understanding and Configuring Dial Peers
  Voice Call Legs
  Configuring POTS Dial Peers
  Configuring VoIP Dial Peers
  Using Dial Peer Wildcards
  Private Line Automatic Ringdown
Understanding Router Call Processing and Digit Manipulation
  Matching Inbound and Outbound Dial Peers
  Using Digit Manipulation
  Practical Scenario 1: PSTN Failover Using the prefix Command
  Practical Scenario 2: Directing Operator Calls to the Receptionist
  Practical Scenario 3: Specific POTS Lines for Emergency Calls
  Practical Scenario 4: Using Translation Profiles
  Using CCP to Configure a CME Dial-Plan
Understanding and Implementing CME Class of Restriction
Quality of Service
  Understanding the Enemy
  Requirements for Voice, Video, and Data Traffic
  Network Requirements for Voice and Video
  Network Requirements for Data
  Using Cisco AutoQoS
Exam Preparation Tasks
  Review All the Key Topics
  Complete the Tables and Lists from Memory
  Definitions of Key Terms

Part III Handling Calls

Chapter 7 Configuring Cisco Unified CME Voice Productivity Features
  “Do I Know This Already?”
  Foundation Topics
  Configuring a Voice Network Directory
  Configuring Call Forwarding
    Forwarding Calls from the IP Phone
    Forwarding Calls from the CLI
    Using the call-forward pattern Command to Support H.450.3
  Configuring Call Transfer
  Configuring Call Park
  Configuring Call Pickup
  Configuring Intercom
  Configuring Paging
  Configuring After-Hours Call Blocking
  Configuring CDRs and Call Accounting
  Configuring Music on Hold
  Configuring Single Number Reach
  Enabling the Flash-Based CME GUI
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 8 Administrator and End-User Interfaces
“Do I Know This Already?”
Foundation Topics
Describe the CUCM GUI and CLI
  Cisco Unified Communications Manager Administration Interface
  Cisco Unified Serviceability Administration Interface
  Cisco Unified Operating System Administration Interface
  Disaster Recovery System Interface
  Cisco Unified Reporting Interface
CLI
User Management in CUCM: Roles and Groups
Roles
Groups
Describe the CUC GUI and CLI
Cisco Unity Connection Administration
Cisco Unity Connection Serviceability
Describe the Cisco Unified Presence Server GUI and CLI
Cisco Unified Presence Administration Interface
Cisco Unified Presence Serviceability
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Part IV Telephony Feature Management

Chapter 9 Managing Endpoints and End Users in CUCM
“Do I Know This Already?”
Foundation Topics
Implementing IP Phones in CUCM
  Special Functions and Services Used by IP Phones
  NTP
  CDP
  DHCP
  PoE
  TFTP
  DNS
  IP Phone Registration Process
  SIP Phone Registration Process
  Preparing CUCM to Support Phones
  Service Activation
  DHCP Server Configuration
  Configuring DHCP in Router IOS
  IP Phone Configuration Requirements in CUCM
Device Pool
Device Defaults
Softkey Template and Phone Button Template
Profiles
Describe End Users in CUCM
End Users Versus Application Users
Credential Policy
Features Interacting with User Accounts
User Locale
Device Association
Implementing End Users in CUCM
Manual Entry
Bulk Import Using BAT
LDAP Integration
LDAP Synchronization
LDAP Authentication
LDAP Integration Considerations
LDAP Sync Agreements
LDAP Sync Mechanism
LDAP Custom Filters
Configure LDAP Sync
Activate DirSync
Configure the LDAP System
Configure the LDAP Directory
Verify LDAP Sync
Configuring LDAP Authentication
Verify LDAP Authentication
Create LDAP Custom Filters
Exam Preparation Tasks
Review All the Key Topics

Chapter 10 Understanding CUCM Dial-Plan Elements and Interactions
“Do I Know This Already?”
Foundation Topics
CUCM Call Flows
  Call Flow in CUCM if DNS Is Used
  Call Flow in CUCM if DNS Is Not Used
  Centralized Remote Branch Call Flow
Centralized Deployment PSTN Backup Call Flow
Centralized Deployment Considerations and Limitations
PSTN Backup Using CAC
Distributed Deployment Call Flow
Call-Routing Sources in CUCM
Call-Routing Destinations in CUCM
Call-Routing Configuration Elements
Route Pattern
Route List
Route Group
Gateways and Trunks
Call-Routing Behavior
Digit Analysis
Hunt Groups
Class of Control
Partition
Calling Search Space
Interaction of Partitions and Calling Search Spaces
Line-Device Configuration

Exam Preparation Tasks
Review All the Key Topics

Part V Voicemail and Presence Solutions

Chapter 11 Enabling Telephony Features with CUCM

“Do I Know This Already?”

Foundation Topics
Describe Extension Mobility in CUCM
Enable EM in CUCM
- Step 1: Activate the EM Service
- Step 2: Configure EM Service Parameters
- Step 3: Add the EM Service
- Step 4: Create Default Device Profiles
- Step 5a: Create Device Profiles
- Step 5b: Subscribe Device Profiles to the EM Service
- Step 6: Associate Users with Device Profiles
- Step 7a: Enable EM for Phones
- Step 7b: Subscribe Phones to EM Service

Describe Telephony Features in CUCM
Call Coverage
Call Forward
Shared Lines
Barge and Privacy
Call Pickup
Call Hunting
Call Park
Intercom
CUCM Native Presence
Presence Architecture

Enable Telephony Features in CUCM
Enabling Call Coverage
Configuring Shared Lines
Configuring Barge
Configuring Call Pickup
Configuring Call Park and Directed Call Park
Configuring Call Hunting
Configuring Intercom Features
Configure CUCM Native Presence
Configuring BLF Speed Dials
Configuring Presence-Enabled Call Lists
Configuring Custom Presence Groups

Exam Preparation Tasks
Review All the Key Topics

Chapter 12 Enabling Mobility Features in CUCM
“Do I Know This Already?”
Foundation Topics
Understanding CUCM Mobility Features
  Describe Mobile Connect
  Unified Mobility Architecture
  Access Lists
  Time-of-Day Access
  Mobile Voice Access
Implementing Mobility Features in CUCM
  Configuring Mobile Connect
  Step 1: Configure Softkey Templates
  Step 2: Configure User Accounts for Mobility
  Step 3: Configure the IP Phone to Support Mobility Features
  Step 4: Create Remote Destination Profiles
  Step 5: Add Remote Destinations to Remote Destination Profiles
  Step 6: Configure Ring Schedules for Each Remote Destination
  Step 7: Configure Access Lists
  Step 8: Apply Access Lists
  Step 9: Configure Service Parameters
Configuring MVA
  Step 1: Activate the MVA Service
  Step 2: Configure Service Parameters
  Step 3: Enable MVA for Each User
  Step 4: Configure the MVA Media Resource
  Step 5: Configure the MVA VXML Application at the IOS Gateway

Exam Preparation Tasks
Review All the Key Topics
Definition of Key Terms

Part VI Voice Network Management and Troubleshooting

Chapter 13 Voicemail Integration with Cisco Unity Connection
“Do I Know This Already?”
Foundation Topics
Describe Cisco Unity Connection
  Overview of Cisco Unity Connection
  Single-Site and Multisite Deployment Considerations
  CUC Integration Overview
CUC Integration with CUCM Using SCCP
CUC Integration Using SIP
CUC Features
System Settings
Call Handlers
Call Routing
Direct Routing Rules
Forwarded Routing Rules
Call Routing Rule Filters
Distribution Lists
Authentication Rules
Dial-Plan
Describe Cisco Unity Connection Users and Mailboxes
User Templates
User Template Basics
Password Settings
Roles
Transfer Rules and Greetings
Call Actions
Message Settings, Message Actions, and Caller Input
TUI Settings
CUC End Users
Extension and Call Forward Options
Voice Messaging with SRST and AAR
Voicemail Box
Private Distribution Lists
Notification Devices
User Creation Options
CUC Voicemail Boxes
Message Aging Policy and Mailbox Quotas
Implement Cisco Unity Connection Users and Mailboxes
Configure End User Templates
User Template Basics
Password Settings
Roles
Message Settings
Message Actions
Phone Menu
Playback Message Settings
Notification Devices
Configure CUC End Users
Manual Process
Alternate Extensions and Names
Private DLs
Importing End Users in to CUC
Importing Users from CUCM
Importing Users from LDAP
Chapter 14 Enabling Cisco Unified Presence Support
“Do I Know This Already?”

Foundation Topics
Describe Cisco Unified Presence Features
Cisco Unified Personal Communicator
CUPC Operating Modes
Enterprise Instant Messaging
Voice Calls
Video Calls
Integration Support
CUPC System Requirements
Cisco Unified Client Services Framework
Cisco Unified Communications Manager IP Phone Service
Cisco IP Phone Messenger

Describe Cisco Unified Presence Architecture
Integration with Microsoft Office Communications Server
Integration with LDAP
Integration with Cisco Unity Connection
Integration with Conferencing Resources
Integration with Calendar Resources
Architecture and Call Flow: Softphone Mode
Architecture and Call Flow: Deskphone Control Mode
Compliance and Persistent Chat
CUPS and QoS Considerations

Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 15 Common CME Management and Troubleshooting Issues
“Do I Know This Already?”

Foundation Topics
Troubleshooting
Troubleshooting Common CME Registration Issues
Troubleshooting Dial-Plan and QoS Issues
- Dial-Plan Issues
- QoS Issues

Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 16 Management and Troubleshooting of Cisco Unified Communications Manager
“Do I Know This Already?”

Foundation Topics
Describe How to Provide End-User Support for Connectivity and Voice
  Quality Issues
  Troubleshooting
  Troubleshooting IP Phone Registration Problems
  Deleting Unassigned Directory Numbers Using the Route Plan Report
Describe CUCM Reports and How They Are Generated
  Generating Reports
  Analyzing Reports
Understand CUCM CDR Analysis and Reporting Tool Reports
  Activate CAR-Related Services
  Configure CDR Service Parameters
  CAR Tool Users
  CDR and CMR Architecture
  CAR System Parameters
  Exporting CDR and CMR Records
  Generating CDR Reports
  Example Report Generation
  Generating System Reports
  Generating Device Reports
Describe Cisco Unified RTMT
  RTMT Interface
  Monitoring CUCM with RTMT
  CallManager Summary
  Gateway Activity
  Device Search
  Database Summary
Describe the Disaster Recovery System
  Using the DRS
  Set Up a Backup Device
  Create a Scheduled Backup
  Perform a Restore

Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms

Chapter 17 Monitoring Cisco Unity Connection
“Do I Know This Already?”

Foundation Topics
Generating and Accessing Cisco Unity Connection Reports
  Cisco Unity Connection Serviceability Reports
  Cisco Unified Serviceability: Serviceability Reports Archive
Analyzing Cisco Unity Connection Reports
Troubleshooting and Maintenance Operations Using Cisco Unity Connection Reports
Reports to Support Routine Maintenance

Exam Preparation Tasks
- Review All the Key Topics
- Definitions of Key Terms

Chapter 18 Final Preparation

Tools for Final Preparation
- Pearson Cert Practice Test Engine and Questions on the CD
  - Install the Software from the CD
  - Activate and Download the Practice Exam
- Activating Other Exams
- Premium Edition
- Cisco Learning Network
- Chapter-Ending Review Tools
- Suggested Plan for Final Review/Study
- Using the Exam Engine
Cisco Certified Network Associate Wireless (CCNA Wireless) recognizes the critical importance of professionals supporting wireless LANS including Networking Associates/Administrators, Wireless Support Specialists and WLAN project managers. CCNA Wireless validates associate-level knowledge and skills to configure, implement and support of wireless LANs, specifically those networks using Cisco equipment. With a CCNA Wireless certification, network professionals can support a basic wireless network on a Cisco WLAN in a SMB to enterprise network. The CCNA Wireless curriculum includes information and practice activities to prepare them for configuring, monitoring and troubleshooting basic tasks of a Cisco WLAN in SMB and Enterprise networks.

Prerequisites

- Valid Cisco CCNA or any Cisco CCIE certification can act as a prerequisite.

At The Course Completion

Describe WLAN fundamentals

- Describe basics of spread spectrum technology
- Describe the impact of various wireless technologies (Bluetooth, WiMAX, ZigBee, and cordless phone)
- Describe wireless regulatory bodies, standards and certifications (FCC, ETSI, 802.11a/b/g/n, and WiFi Alliance)
- Describe Wireless LAN (WLAN) RF principles (antenna types, RF gain/loss, Effective Isotropic Radiated Power (EIRP), refraction, reflection, and so on)
- Describe networking technologies used in wireless (SSID to WLAN_ID to Interface to VLAN, 802.1q trunking)
- Describe wireless topologies, such as Independent Basic Service Set (IBSS), Basic Service Set (BSS), Extended Service Set (ESS), Point-to-Point, Point-to-Multipoint, Mesh, and bridging)
- Describe 802.11 authentication and encryption methods (Open, Shared, 802.1X, EAP, TKIP, and AES)
- Describe frame types (associated and unassociated, management, control, and data)
COURSE OUTLINE

- Describe basic RF deployment considerations related to site survey design of data or VoWLAN applications, common RF interference sources such as devices, building material, AP location, and basic RF site survey design related to channel reuse, signal strength, and cell overlap

Install a basic Cisco wireless LAN
- Identify the components of the Cisco Unified Wireless Network architecture (Split MAC, LWAPP, stand-alone AP vs controller-based AP, specific hardware examples)
- Install and configure autonomous access points in the small business environment
- Describe the modes of controller-based AP deployment (local, monitor, HREAP, sniffer, rogue detector, bridge, OEAP, and SE-Connect)
- Describe controller-based AP discovery and association (DHCP, DNS, Master-Controller, Primary-Secondary-Tertiary, and n+1 redundancy)
- Describe roaming (Layer 2 and Layer 3, intra-controller and inter-controller, and mobility list)
- Configure a WLAN controller and access points WLC: ports, interfaces, WLANs, NTP, CLI and Web UI, CLI wizard, and link aggregation group (LAG) AP: Channel and Power
- Describe Radio Resource Management (RRM) fundamentals including ED-RRM.
- Verify basic wireless network operation

Install Wireless Clients
- Describe client WLAN configuration requirements, such as Service Set Identifier (SSID), security selection, and authentication
- Identify basic configuration of common wireless supplicants (Macintosh, Intel Wireless Pro, Windows, iOS, and Android)
- Describe basic AnyConnect 3.0 or above wireless configuration parameters
- Identify capabilities available in CCX versions 1 through 5

Implement basic WLAN Security
- Describe the general framework of wireless security and security components (authentication, encryption, MFP, IPS)
- Describe and configure authentication methods (Guest, PSK, 802.1X, WPA/WPA2 with EAP-TLS, EAP-FAST, PEAP, LEAP)
- Describe and configure encryption methods (WPA/WPA2 with TKIP, AES)
- Describe and configure the different sources of authentication (PSK, EAP-local or-external, Radius)

Operate basic WCS
- Identify key functions of Cisco Wireless Control System (WCS) and Navigator (versions and licensing)
- Navigate WCS interface
- Configure controllers and access points (APs) (using the Configuration tab not templates)
- Use preconfigured maps in the WCS (adding/relocating/removing access points, turn on/off heat maps, view client location, and view CleanAir zones of influence)
- Use the WCS monitor tab and alarm summary to verify the WLAN operations
- Generate standard WCS reports (inventory, CleanAir, client-related, AP-related, and utilization)

Conduct basic WLAN Maintenance and Troubleshooting
- Identify and use basic WLAN troubleshooting tools (WLC show debug and logging) for client to AP connectivity, AP to controller connectivity
- Use the WCS client troubleshooting tool
- Transfer logs, configuration files, and O/S images to and from the WLC via the GUI
• Differentiate and use WLC and AP (autonomous and LAP) management access methods (console port, CLI, telnet, ssh, http, https, and wired vs wireless management)

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**Required Exams**

The Implementing Cisco Unified Wireless Network Essential (IUWNE) exam is the exam associated with the CCNA Wireless certification (640-722 IUWNE).
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

Cisco Certified Network Professional Security (CCNP Security) Boot Camp program is aligned specifically to the job role of the Cisco Network Security Engineer responsible for Security in Routers, Switches, Networking devices and appliances, as well as choosing, deploying, supporting and troubleshooting Firewalls, VPNS, and IDS/IPS solutions for their networking environments.

Prerequisite

CCNA Security certification

Course Content

CCNP Security Boot Camp is consisted of the following four courses:

Implementing Cisco Secure Access Solutions (SISAS)

Implementing Cisco Secure Access Solutions (SISAS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Identity Services Engine and 802.1X secure network access. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed network access security by utilizing Cisco ISE appliance product solution.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco Identity Services Engine architecture and access control capabilities.
- Understand 802.1X architecture, implementation and operation.
- Understand commonly implemented Extensible Authentication Protocols (EAP).
- Implement Public-Key Infrastructure with ISE.
- Understand the implement Internal and External authentication databases.
- Implement MAC Authentication Bypass.
- Implement identity based authorization policies.
- Understand Cisco TrustSec features.
- Implement Web Authentication and Guest Access.
- Implement ISE Posture service.
- Implement ISE Profiling.
- Understand Bring Your Own Device (BYOD) with ISE.
Troubleshoot ISE

**Implementing Cisco Edge Network Security Solutions (SENSS)**

Implementing Cisco Edge Network Security Solutions (SENSS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience to prepare them to configure Cisco perimeter edge security solutions utilizing Cisco Switches, Cisco Routers, and Cisco Adaptive Security Appliance (ASA) Firewalls. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls, Cisco Routers with the firewall feature set, and Cisco Switches.

**Course Objectives**

- Understanding and implementing Cisco modular Network Security Architectures such as SecureX and TrustSec.
- Deploy Cisco Infrastructure management and control plane security controls.
- Configuring Cisco layer 2 and layer 3 data plane security controls.
- Implement and maintain Cisco ASA Network Address Translations (NAT).
- Implement and maintain Cisco IOS Software Network Address Translations (NAT).
- Designing and deploying Cisco Threat Defense solutions on a Cisco ASA utilizing access policy and application and identity based inspection.
- Implementing Botnet Traffic Filters.
- Deploying Cisco IOS Zone-Based Policy Firewalls (ZBFW).
- Configure and verify Cisco IOS ZBFW Application Inspection Policy.

**Implementing Cisco Secure Mobility Solutions (SIMOS)**

Implementing Cisco Secure Mobility Solutions (SIMOS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. This course is designed to prepare network security engineers with the knowledge and skills they need to protect data traversing a public or shared infrastructure such as the Internet by implementing and maintaining Cisco VPN solutions.

**Course Objectives**

Upon completing this course, the learner will be able to meet these overall objectives:

- Describe the various VPN technologies and deployments as well as the cryptographic algorithms and protocols that provide VPN security.
- Implement and maintain Cisco site-to-site VPN solutions.
- Implement and maintain Cisco FlexVPN in point-to-point, hub-and-spoke, and spoke-to-spoke IPsec VPNs.
- Implement and maintain Cisco clientless SSL VPNs.
• Implement and maintain Cisco AnyConnect SSL and IPsec VPNs.
• Implement and maintain endpoint security and dynamic access policies (DAP).

Implementing Cisco Threat Control Solutions (SITCS)
Implementing Cisco Threat Control Solutions (SITCS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Next Generation Firewall (NGFW) as well as Web Security, Email Security and Cloud Web Security. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls utilizing Cisco Next Generation product solution which integrates Cisco Prime Security Manager for managing identity policies.

Course Objectives
Upon completing this course, the learner will be able to meet these overall objectives:

• Understand Cisco ASA Next-Generation Firewall (NGFW)
• Deploy Cisco Web Security appliance to mitigate malware
• Configure Web Security appliance for acceptable use controls
• Configure Cisco Cloud Web Security Connectors
• Describe Cisco Email Security Solution
• Configure Cisco Email Appliance Incoming and Outgoing Policies
• Describe IPS Threat Controls
• Configure and Implement Cisco IPS Sensor into a Network.
Cisco Certified Network Professional Voice (CCNP Voice) validates advance knowledge and skills required to integrate into underlying network architectures. Furthermore, this certification validates a robust set of skills in implementing, operating, configuring, and troubleshooting a converged IP network. With a CCNP Voice certification, a network professional can create a collaboration solution that is transparent, scalable, and manageable. The CCNP Voice focuses on Cisco Unified Communications Manager (formerly Unified CallManager), quality of service (QoS), gateways, gatekeepers, IP phones, voice applications, and utilities on Cisco routers and Cisco Catalyst switches. Additionally, the integration and troubleshooting of Cisco Unified Communications applications are now covered in the CCNP Voice, specifically the Cisco Unity Connection and Cisco Unified Presence applications.

Prerequisite
Cisco CCNA Voice

Required Exam

• 642–437 CVOICE Implementing Cisco Unified Communications Voice over IP and QoS

• 642–447 CIPT1 Implementing Cisco Unified Communications Manager, Part 1

• 642–457 CIPT2 Implementing Cisco Unified Communications Manager, Part 2

• 642–427 TVOICE Troubleshooting Cisco Unified Communications

• 642–467 CAPPS Integrating Cisco Unified Communications Applications

Course Outline

Implementing Cisco Unified Communications Voice over IP and QoS

Chapter 1 Introducing Voice Gateways
The Role of Gateways
  Traditional Telephony Networks
  Cisco Unified Communications Overview
  Cisco Unified Communications Architecture
  Cisco Unified Communications Business Benefits
  Cisco Unified Communications Gateways
Gateway Operation
Comparing VoIP Signaling Protocols
Gateway Deployment Example
IP Telephony Deployment Models
  Single-Site Deployment
  Multisite WAN with Centralized Call-Processing Deployment
  Multisite WAN with Distributed Call-Processing Deployment
  Clustering over the IP WAN Deployment
Modern Gateway Hardware Platforms
  Cisco 2900 Series Integrated Services Routers
  Cisco 3900 Series Integrated Services Routers
Well-Known Older Enterprise Models
  Cisco 2800 Series Integrated Services Routers
  Cisco 3800 Series Integrated Services Routers
Specialized Voice Gateways
  Cisco ATA 186
  Cisco VG248 Analog Phone Gateway
  Cisco AS5350XM Series Universal Gateway
  Cisco AS5400 Series Universal Gateway Platforms
  Cisco 7200 Series Routers
Gateway Operational Modes
  Voice Gateway Call Legs
  Voice-Switching Gateway
  VoIP Gateway
  Cisco Unified Border Element
How Voice Gateways Route Calls
Gateway Call-Routing Components
  Dial Peers
  Call Legs
Configuring POTS Dial Peers
  Matching a Dial Peer
  Matching Outbound Dial Peers
  Default Dial Peer
Direct Inward Dialing
  Two-Stage Dialing
  One-Stage Dialing
Configuration of Voice Ports
Analogue Voice Ports
  Signaling Interfaces
  Analog Voice Port Interfaces
Analog Signaling
  FXS and FXO Supervisory Signaling
  Analog Address Signaling
  Informational Signaling
  E&M Signaling
  E&M Physical Interface
  E&M Address Signaling
Configuring Analog Voice Ports
- FXS Voice Port Configuration
- FXO Voice Port Configuration
- E&M Voice Port Configuration

Trunks
- Analog Trunks
- Centralized Automated Message Accounting Trunk
- Direct Inward Dialing Trunk

Timers and Timing

Verifying Voice Ports

Digital Voice Ports

Digital Trunks
- T1 CAS
- E1 R2 CAS
- Nonfacility Associated Signaling

Configuring a T1 CAS Trunk
- Configuring T1 CAS Trunks: Inbound E&M FGD and Outbound FGD EANA Example
- Configuring an E1 R2 Trunk Example
- Configuring an ISDN Trunk

Verifying Digital Voice Ports

Cross-Connecting a DS0 with an Analog Port

Echo Cancellation
- Echo Origin
- Talker Echo
- Listener Echo
- Echo Cancellation
- Echo Canceller Operation
- Echo Canceller Components

Configuring Echo Cancellation

Voice Packets Processing with Codecs and DSPs

Codecs
- Impact of Voice Samples and Packet Size on Bandwidth

Evaluating Quality of Codecs
- Mean Opinion Score
- Perceptual Evaluation of Speech Quality
- Perceptual Evaluation of Audio Quality
- Test Method Comparison

Codec Quality
- Evaluating Overhead
- Bandwidth Calculation Example
- Per-Call Bandwidth Using Common Codecs

Digital Signal Processors
- Hardware Conferencing and Transcoding Resources
- DSP Chip
- Codec Complexity
- Recommended Usage in Deployment Models
- Packet Voice DSP Module Conferencing
DSP Calculator
Configuring DSPs
Configuring Conferencing and Transcoding on Voice Gateways
DSP Farms
DSP Profiles
SCCP Configuration
Unified Communications Manager Configuration
Cisco IOS Configuration Commands for Enhanced Media Resources
DSP Farm Configuration Commands for Enhanced Media Resources
SCCP Configuration Commands for Enhanced Media Resources
Verifying Media Resources
Summary
Chapter Review Questions

Chapter 2 Configuring Basic Voice over IP
Voice Coding and Transmission
VoIP Overview
Major Stages of Voice Processing in VoIP
VoIP Components
  Sampling
  Quantization
  Coding
VoIP Packetization
  Packetization Rate
  Codec Operations
  Packetization and Compression Example
VoIP Media Transmission
  Real-Time Transport Protocol
  Real-Time Transport Control Protocol
  Compressed RTP
  Secure RTP
  VoIP Media Considerations
Voice Activity Detection
  Bandwidth Savings
  Voice Port Settings for VAD
Voice Signaling Protocols: H.323
H.323 Architecture
  H.323 Advantages
  H.323 Network Components
H.323 Call Flows
  H.323 Slow Start Call Setup
  H.323 Slow Start Call Teardown
  H.225 RAS Call Setup
  H.225 RAS Call Teardown
Codecs in H.323
  Negotiation in Slow Start Call Setup
  H.323 Fast Connect
H.323 Early Media
Configuring H.323 Gateways
  H.323 Gateway Configuration Example
Customizing H.323 Gateways
  H.323 Session Transport
  Idle Connection and H.323 Source IP Address
  H.225 Timers
  H.323 Gateway Tuning Example
Verifying H.323 Gateways
Voice Signaling Protocols: SIP
  SIP Architecture
    Signaling and Deployment
    SIP Architecture Components
    SIP Servers
    SIP Architecture Examples
  SIP Call Flows
    SIP Call Setup Using Proxy Server
    SIP Call Setup Using Redirect Server
  SIP Addressing
    SIP Addressing Variants Example
    Address Registration
    Address Resolution
  Codecs in SIP
    Delayed Offer
    Early Offer
    Early Media
Configuring Basic SIP
  User Agent Configuration
  Dial-Peer Configuration
  Basic SIP Configuration Example
Configuring SIP ISDN Support
  Calling Name Display
  Blocking and Substituting Caller ID
  Blocking and Substituting Caller ID Commands
Configuring SIP SRTP Support
  SIPS Global and Dial-Peer Commands
  SRTP Global and Dial-Peer Commands
  SIPS and SRTP Configuration Example
Customizing SIP Gateways
  SIP Transport
  SIP Source IP Address
  SIP UA Timers
  SIP Early Media
  Gateway-to-Gateway Configuration Example
  UA Example
Verifying SIP Gateways
  SIP UA General Verification
SIP UA Registration Status
SIP UA Call Information
SIP Debugging Overview
Examining the INVITE Message
Examining the 200 OK Message
Examining the BYE Message

Voice Signaling Protocols: MGCP
MGCP Overview
MGCP Advantages
MGCP Architecture
MGCP Gateways
MGCP Call Agents
Basic MGCP Concepts
MGCP Calls and Connections
MGCP Control Commands
Package Types
MGCP Call Flows
Configuring MGCP Gateways
MGCP Residential Gateway Configuration Example
Configuring an MGCP Trunk Gateway Example
Configuring Fax Relay with MGCP Gateways
Verifying MGCP
Debug Commands

VoIP Quality Considerations
IP Networking and Audio Clarity
Jitter
Delay
Acceptable Delay
Packet Loss
VoIP and QoS
Objectives of QoS
Using QoS to Improve Voice Quality
Transporting Modulated Data over IP Networks
Differences from Fax Transmission in the PSTN
Fax Services over IP Networks
Understanding Fax/Modem Pass-Through, Relay, and Store and Forward
Fax Pass-Through
Modem Pass-Through
Fax Relay
Modem Relay
Store-and-Forward Fax
Gateway Signaling Protocols and Fax Pass-Through and Relay
Cisco Fax Relay
H.323 T.38 Fax Relay
SIP T.38 Fax Relay
MGCP T.38 Fax Relay
Gateway-Controlled MGCP T.38 Fax Relay
Call Agent—Controlled MGCP T.38 Fax Relay
DTMF Support
  H.323 DTMF Support
  MGCP DTMF Support
  SIP DTMF Support
Customization of Dial Peers
  Configuration Components of VoIP Dial Peer
    VoIP Dial-Peer Characteristics
  Configuring DTMF Relay
    DTMF Relay Configuration Example
  Configuring Fax/Modem Support
    Cisco Fax Relay and Fax Pass-Through
    T.38 Fax Relay Configuration
    Fax Relay Speed Configuration
    Fax Relay SG3 Support Configuration
    Fax Support Configuration Example
  Configuring Modem Support
    Modem Pass-Through
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- Issues with Roaming Users
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Trunk Considerations When Using Globalized Call Routing
CUCM Clusters and CCD Configuration Modes
Other SAF and CCD Considerations

Troubleshooting Cisco Unified Communications

This portion of the program will cover knowledge and skills required to troubleshoot Cisco Unified Communications systems and solutions in different deployments. In addition, students will learn troubleshooting methodology, triage, resources, tools, and fixes for Cisco Unified Communications Manager and the new features such as Call Control Discovery, SIP Precondition, Extension Mobility Cross Cluster as well as dial plan troubleshooting including globalized call routing.

Integrating Cisco Unified Communications Applications

Chapter 1 Integrating Cisco Unified Communications Applications
Chapter 2 Cisco Unity Connection
Chapter 3 Cisco Unity Connection and Cisco Unified Communication Manager
Chapter 4 Cisco Unity Express
Chapter 5 VPIM
Chapter 6 Cisco Unified Presence Server (CUPS)
Cisco CCNP Wireless Bootcamp

About this Course

Cisco Certified Network Professional Wireless (CCNP Wireless) certification addresses the need for designing, implementing, and operating Cisco Wireless networks and mobility infrastructures. CCNP Wireless certification emphasizes wireless networking principles and theory. It also recognizes the expertise and technical acumen of wireless professionals who can assess and translate network business requirements into technical specifications that in turn, are incorporated into successful installations.

Required Exam

- 642-732 CUWSS Conducting Cisco Unified Wireless Site Survey
- 642-742 IUWVN Implementing Cisco Unified Wireless Voice Networks
- 642-747 IUWMS Implementing Cisco Unified Wireless Mobility Services
- 642-737 IAUWS Implementing Advanced Cisco Unified Wireless Security

Prerequisites

Cisco CCNA Wireless

Course Outline

Chapter 1: Introduction to Network Maintenance

- Foundation Topics
  - Understanding Maintenance Methods
  - Introducing Network Maintenance
  - Proactive Versus Reactive Network maintenance
  - Well-Known Network Maintenance Models
  - Adapting a Well-Known Network Maintenance Model
- Identifying Common Maintenance Procedures
  - Routine Maintenance Tasks
  - Benefits of Scheduled Maintenance
  - Managing Network Changes
  - Maintaining Network Documentation
  - Restoring Operation After Failure
  - Measuring Network Performance
- The Network Maintenance Toolkit
  - Basic Network Maintenance Tools
  - Network Documentation Tools
  - Incident Recovery Tools
  - Monitoring and Measuring tools

Chapter 2: Introduction to Troubleshooting Processes

- Troubleshooting Methods
  - Defining Troubleshooting
  - The Value of a Structured Troubleshooting Approach
  - Popular Troubleshooting Methods
  - The Top-Down Method

- Practice Exercise: Selecting a Troubleshooting Approach
- Using Troubleshooting Procedures
- Problem Report
  - Collect information
  - Examine Collected Information
  - Eliminate Potential Causes
  - Hypothesize Underlying Causes
  - Verify Hypothesis
  - Problem Resolution
- Including Troubleshooting in Routine Network Maintenance
  - The relationship between maintenance and troubleshooting tasks
  - Maintaining current network documentation
  - Establishing a baseline
  - Communicating throughout the troubleshooting process
  - Change management

Chapter 3: The Maintenance and Troubleshooting Toolbox

- Cisco IOS Diagnostic Tools
  - Filtering the Output of SHOW commands
  - Troubleshooting Connectivity
  - Troubleshooting Hardware
- Specialized Diagnostic Tools
  - Using specialized tools in the troubleshooting process
- Performing Packet Captures
- Creating a Baseline with SNMP and Netflow
  - SNMP
Chapter 4: Basic Cisco Catalyst Switch Troubleshooting

- VLAN Troubleshooting
  - Reviewing Layer 2 Switching
  - Layer 2 Troubleshooting Techniques

- Spanning Tree Protocol Troubleshooting
  - Reviewing STP Operation
  - Collecting Information About an STP Topology
  - STP Troubleshooting Issues
  - Troubleshooting Ether Channel

- Trouble Ticket: STP
  - Trouble Ticket #1
  - Suggested Solution

Chapter 5: Advanced Cisco Catalyst Switch Troubleshooting

- Resolving InterVLAN Routing Issues
  - Contrasting Layer 3 Switches with Routers
  - Control Plane and Data Plane Troubleshooting
  - Comparing Routed Switch Ports and Switched Virtual Interfaces

- Router Redundancy Troubleshooting
  - HSRP
  - Converging After a Router Failure
  - HSRP Verification and Troubleshooting
  - VRRP
  - GLBP
  - Troubleshooting VRRP and GLBP

- Cisco Catalyst Switch Performance Troubleshooting
  - Cisco Catalyst Switch Troubleshooting Targets
  - TCAM Troubleshooting
  - High CPU Utilization Level Troubleshooting

- Trouble Ticket: HSRP
  - Trouble Ticket #2
  - Suggested Solution

Chapter 6: Introduction to Troubleshooting Routing Protocols

- Layer 3 Troubleshooting
  - Basic Routing Processes
  - Troubleshooting Basic Routing

- EIGRP Troubleshooting
  - Data Structures of IP Routing Protocols
  - Data Structures of EIGRP
  - EIGRP Operation
  - EIGRP Troubleshooting Commands

- Trouble Ticket: EIGRP
  - Trouble Ticket #3
  - Suggested Solution

Chapter 7: OSPF and Route Redistribution Troubleshooting

- OSPF Troubleshooting
  - OSPF Data Structures
  - OSPF Operation
  - OSPF Troubleshooting Commands

- Trouble Ticket: OSPF
  - Trouble Ticket #4

- Route Redistribution Troubleshooting
  - Route Redistribution Overview
  - Route Redistribution Troubleshooting Targets

- Trouble Ticket: Route Redistribution with EIGRP and OSPF
  - Trouble Ticket #5
  - Suggested Solution

Chapter 8: Troubleshooting BGP and Router Performance Issues

- BGP Troubleshooting Issues
  - BGP Data Structures
  - BGP Troubleshooting commands

- Trouble Ticket: BGP
  - Trouble Ticket: #6
  - Suggested Solution

- Router Performance Issues
  - Excessive CPU Utilization
  - Processes that commonly cause excessive CPU Utilization
  - Cisco IOS Commands used for troubleshooting high processor utilization
    - Understanding Packet Switching Methods
    - Operation of process switching
    - Operation of Fast Switching
    - Operation of Cisco Express Forwarding
    - Troubleshooting Packet Switching Modes
      - Excessive Memory Utilization
      - Common Memory Troubleshooting Targets
      - Excessive BGP Memory Use

Chapter 9: Security Troubleshooting

- Introduction to Cisco IOS Security
  - Securing the Management Plane
  - Securing the Control Plane
  - Securing the Data Plane
  - Troubleshooting Network Security Issues

- Security Troubleshooting Targets

- Configuring and Troubleshooting the Cisco IOS Firewall Feature
  - Configuring and Troubleshooting AAA

- Trouble Ticket: Cisco IOS Security
  - Trouble Ticket #7
  - Issue #1: forgotten Enable Secret Password
  - Issue #2: An exec-timeout Parameter Set Too Low
  - Issue #3: ACL Misconfiguration

Chapter 7: OSPF and Route Redistribution Troubleshooting

- OSPF Troubleshooting
  - OSPF Data Structures
  - OSPF Operation
  - OSPF Troubleshooting Commands

- Trouble Ticket: OSPF
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- Route Redistribution Troubleshooting
  - Route Redistribution Overview
  - Route Redistribution Troubleshooting Targets

- Trouble Ticket: Route Redistribution with EIGRP and OSPF
  - Trouble Ticket #5
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Chapter 8: Troubleshooting BGP and Router Performance Issues

- BGP Troubleshooting Issues
  - BGP Data Structures
  - BGP Troubleshooting commands

- Trouble Ticket: BGP
  - Trouble Ticket: #6
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Chapter 9: Security Troubleshooting

- Introduction to Cisco IOS Security
  - Securing the Management Plane
  - Securing the Control Plane
  - Securing the Data Plane
  - Troubleshooting Network Security Issues

- Security Troubleshooting Targets

- Configuring and Troubleshooting the Cisco IOS Firewall Feature
  - Configuring and Troubleshooting AAA

- Trouble Ticket: Cisco IOS Security
  - Trouble Ticket #7
  - Issue #1: forgotten Enable Secret Password
  - Issue #2: An exec-timeout Parameter Set Too Low
  - Issue #3: ACL Misconfiguration
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  - Types of NAT
  - Sample NAT Topology
  - Potential NAT Troubleshooting Issues
  - Order of Operations for an Interface
  - NAT Troubleshooting Syntax
• DHCP Troubleshooting
  - Basic DHCP Operation
  - DHCP Configurations
  - Potential DHCP Troubleshooting Issues
  - DHCP Troubleshooting Syntax
• Trouble Ticket: NAT
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Chapter 11: IP Communications Troubleshooting
• Voice Troubleshooting
  - Overview of IP Telephony
  - Design Considerations for Voice Networks
  - Cisco IP Phone boot-up process
  - Common Voice Troubleshooting Issues
  - Overview of Quality of Service
• Video troubleshooting
  - Introduction to IP-Based Video
  - Design Considerations for Video
  - Multicasting
  - Common Video Troubleshooting Issues
• Trouble tickets: Unified Communications
  - Trouble Ticket #9
  - Trouble Ticket #10

Chapter 12: IPv6 Troubleshooting
• Reviewing IPv6
  - IPv6 Address Types
  - IPv6 Address Format
  - IPv6 Routing Options
  - Configuring IPv6 Support
  - Tunneling IPv6 through an IPv4 Tunnel
• OSPFv3 Troubleshooting
  - Characteristics of OSPFv3
  - Configuring OSPFv3
  - Troubleshooting OSPFv3
• Trouble Ticket: IPv6 and OSPF
  - Trouble Ticket #11
  - Viewing Baseline Information
  - Troubleshoot and Resolve and Identified OSPFv3 Adjacency Issue
• RIPng Troubleshooting
  - Review RIPng Theory
  - RIPng Configuration Commands
  - Troubleshooting RIPng
• Trouble ticket: IPv6 and RIPng
  - Trouble Ticket #12
  - Viewing baseline Information
  - Troubleshoot and Resolve the Identified RIPng Issue

Chapter 13: Advanced Services Troubleshooting
• Application Network Services Troubleshooting
  - Application Optimization
  - NetFlow
  - IP SLAs
  - Network-Based Application Recognition
  - QoS
• Wireless Troubleshooting Targets
  - Introducing the Cisco Unified Wireless Network
  - Wired Network Issues Impacting Wireless Networks

Chapter 14: Large Enterprise Network Troubleshooting
• Remote Office Troubleshooting
  - VPN Types
  - Troubleshooting VPN Issues
• Complex Network Troubleshooting
  - Troubleshooting Complex Networks
  - Case Study Review
Certified Ethical Hacker (CEH)

About this Course

Security professionals remain in high demand. The Certified Ethical Hacker (CEH) is a one-of-a-kind certification designed to give the candidate a look inside the mind of a hacker. This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. CEH v8 provides a comprehensive ethical hacking and network security-training program to meet the standards of highly skilled security professionals. Hundreds of SMEs and authors have contributed towards the content presented in the CEH v8 courseware. Latest tools and exploits uncovered from the underground community are featured in the new package. When a student leaves this intensive 5 day class they will have hands on understanding and experience in Ethical Hacking.

Audience Profile

This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

At Course Completion

After completing this course, you will learn:

- Footprinting and reconnaissance
- Hacking web servers, web applications, and wireless networks
- Cryptography
- Penetration testing
- Social engineering
- Trojans, viruses, and worms
- Evading IDS, firewalls, and honeypots
- Enumeration
- Buffer overflows

Prerequisites

At least two years of IT security experience and a strong working knowledge of TCP/IP. CompTIA Security+ course is highly recommended.

Course Outline

Chapter 1 Getting Started with Ethical Hacking

Hacking: A Shorthistory

The Early Days of Hacking

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### Certified Ethical Hacker (CEH)

**Setting a Web Browser to Use a Proxy**

**Chapter 6 Enumeration of Services**

- A Quick Review
- Footprinting
- Scanning
- What Is Enumeration?
- Windows Basics
- Users
- Groups
- Security Identifiers
- Services and Ports of Interest
- Commonly Exploited Services
- NULL Sessions
- SuperScan
- The PsTools Suite
- Enumeration with SNMP
- Management Information Base
- SNScan
- Unix and Linux Enumeration
- finger
- rpcinfo
- showmount

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**Chapter 7 Gaining Access to a System**

- Up to This Point
- System Hacking
- Authentication on Microsoft Platforms
- Executing Applications
- Covering Your Tracks

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Honeypots, IDSs, and Firewalls

The Role of Intrusion Detection Systems

Firewalls

What’s That Firewall Running?

Honeypots

Run Silent, Run Deep: Evasion Techniques

Evading Firewalls

Summary

Chapter 17 Physical Security

Introducing Physical Security

Simple Controls

Dealing with Mobile Device Issues

Securing the Physical Area

Defense in Depth
CEH: Certified Ethical Hacker v7 Course Description

This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. CEHv7 provides a comprehensive ethical hacking and network security-training program to meet the standards of highly skilled security professionals. Hundreds of SMEs and authors have contributed towards the content presented in the CEHv7 courseware. Latest tools and exploits uncovered from the underground community are featured in the new package. When a student leaves this intensive 5 day class they will have hands on understanding and experience in Ethical Hacking.

CEH v7 Features and Enhancements Includes:

- CEH v7 showcases the latest hacking techniques and countermeasures.
- Updated core content and well-organized flow for a best-in-class learning experience.
- Exclusive section for countermeasures against different attacks with detailed explanation of how to implement the countermeasures in a real-time environment.
- Attractive and descriptive diagrammatic representations of concepts and attacks.
- Complete section dedicated to penetration testing, illustrating how to implement learned concepts to test network system security.
- Courseware includes over 20GB of the latest hacking and security tools.
- A result-oriented, descriptive lab manual; the labs showcased in the courseware are tested against the latest Operating Systems with all patches and hot fixes applied.
- CEH v7 meets Government and DoD compliance with Federal Information Security Management Act (FISMA) and DoD Directive 8570.1-M.
- Over 1000 minutes of video demonstrations and more.

Intended Audience for the CEH: Certified Ethical Hacker v7 Course

- This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

CEH: Certified Ethical Hacker v7 Course Objectives

- Students will begin by understanding perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed.
- Students then learn how intruders escalate intruders escalate privileges and what steps can be taken to secure a system.
- Students will also learn about Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows and Virus Creation.
CEH: Certified Ethical Hacker v7 Course Outline

I. Introduction to Ethical Hacking
II. Footprinting and Reconnaissance
III. Scanning Networks
IV. Enumeration
V. System Hacking
VI. Trojans and Backdoors
VII. Viruses and Worms
VIII. Sniffers
IX. Social Engineering
X. Denial of Service
XI. Session Hijacking
XII. Hacking Webservers
XIII. Hacking Web Applications
XIV. SQL Injection
XV. Hacking Wireless Networks
XVI. Evading IDS, Firewalls and Honeypots
XVII. Buffer Overflows
XVIII. Cryptography
XIX. Penetration Testing
# Cisco CCNA Collaboration Certification

**CS110**

**Length:** 7 Day  
**Type:** Hands-On course  
**Delivery Method:** Instructor-led Classroom

## About this Course

The Cisco CCNA Collaboration certification is a job-role focused training and certification program. It will allow you to maximize your investment in your education, and increase your professional value by giving you the skills to help your IT organization meet increased business demands resulting from these technology transitions.

## Audience Profile

For network video engineers, collaboration engineers, IP telephony and IP network engineers who want to develop and advance their collaboration and video skills in line with the convergence of voice, video, data and mobile applications.

## At Course Completion

Upon successful completion of this course, students will master the following:

- Cisco Unified Communications components
- Cisco Unified Communications Manager Express administration, end user management, dial plans, and telephony features
- Cisco Unified Communications Manager administration, end point management, dial plan elements and interactions, and telephony and mobility features
- Cisco Unity Connection voicemail
- CM IM and Presence support
- CME and CUCM management and troubleshooting
- Monitoring Cisco Unity Connection

## Prerequisites

No Prerequisites

## Course Outline

### Part I Voice Perspectives

**Chapter 1 Traditional Voice Versus Unified Voice**

- Analog Connections
- Digital Connections
  - Moving from Analog to Digital
  - Channel Associated Signaling
  - Common Channel Signaling
- Understanding the PSTN

- Components of the PSTN
  - Understanding PBX and Key Systems
  - Connections To and Within the PSTN
  - PSTN Numbering Plans
  - The Emergence of VoIP
  - VoIP: Why It Is a Big Deal for Businesses
  - The Process of Converting Voice to Packets
  - The Role of Digital Signal Processors
  - Understanding RTP and RTCP
  - Review All the Key Topics
Chapter 2 Understanding the Components of Cisco Unified Communications

Unified Collaboration
Understanding Cisco Unified Communications Manager Express
  CME Key Features
  CME Interaction with Cisco IP Phones
Understanding Cisco Unified Communications Manager
  CUCM Key Features
  CUCM Database Replication and Interacting with Cisco IP Phones
Understanding Cisco Unity Connection
  Cisco Unity Connection Key Features
  Cisco Unity Connection and CUCM Interaction
Understanding Cisco Unified CM IM and Presence
Cisco Jabber
Understanding Video Communication Server and TelePresence Management Suite
  Cisco VCS Control and VCS Expressway
  TelePresence Management Suite
Review All the Key Topics
Complete the Tables from Memory
Definitions of Key Terms

Chapter 3 Understanding Cisco IP Phones

Connecting and Powering Cisco IP Phones
Cisco Catalyst Switch PoE
Powering the IP Phone Using a Power Patch Panel or Coupler
Powering the IP Phone with a Power Brick
VLAN Concepts and Configuration
  VLAN Review
  VLAN Trunking/Tagging
Understanding Voice VLANs
VLAN Configuration
Understanding the Cisco IP Phone Boot Process
Configuring a Router-Based DHCP Server
Setting the Clock of a Cisco Device with NTP
IP Phone Registration
Quality of Service
  Understanding the Enemy Traffic
    Network Requirements for Voice, Video, and Data
  Network Requirements for Voice and Video
    Network Requirements for Data
QoS Mechanisms
Link Efficiency Mechanisms
Queuing Algorithms

Chapter 4 Getting Familiar with CME Administration

Preparing the CME Router for Cisco Configuration Professional
Managing CME Using CCP
  CME Integrated GUI
Cisco Configuration Professional
Review All the Key Topics
Complete the Tables from Memory
Definitions of Key Terms

Chapter 5 Managing Endpoints and End Users in CME

Describe End Users in CME
  User Access Levels in CME
Creating Users in CME
  Creating Users with the CME GUI
  Enabling the CME Built-In GUI
Using the CME Built-In GUI to Create the Customer Admin
Create or Modify End Users and Endpoints in CME
  Using the CCP GUI
General Capabilities of CCP
CCP Unified Communications Configuration
Implementing End Users and Endpoints in CME
Review All Key Topics
Complete the Tables from Memory
Define Key Terms

Chapter 6 Understanding the CME Dial Plan

Configuring Physical Voice Port Characteristics
  Configuring Analog Voice Ports
    FXS Ports
    FXO Ports
Configuring Digital Voice Ports
Understanding and Configuring Dial Peers
  Voice Call Legs
  Configuring POTS Dial Peers
  Configuring VoIP Dial Peers
Using Dial Peer Wildcards
Private Line Automatic Ringdown
Understanding Router Call Processing and Digit Manipulation
  Matching Inbound and Outbound Dial Peers
  Using Digit Manipulation
  Practical Scenario 1: PSTN Failover Using the prefix
Command
Practical Scenario 2: Directing Operator Calls to the Receptionist
Practical Scenario 3: Specific POTS Lines for Emergency Calls
Practical Scenario 4: Using Translation Profiles Using CCP to Configure a CME Dial Plan
Understanding and Implementing CME Class of Restriction Using CCP to Implement COR Review All the Key Topics Definitions of Key Terms

Chapter 7 Enabling Telephony Features with CME
Configuring a Voice Network Directory Configuring Call Forwarding Forwarding Calls from the IP Phone Forwarding Calls from the CLI Using the call-forward pattern Command to Support Hi450.3 Configuring Call Transfer Configuring Call Park Configuring Call Pickup Configuring Intercom Configuring Paging Configuring After-Hours Call Blocking Configuring CDRs and Call Accounting Configuring Music on Hold Configuring Single Number Reach Configuring Ephone Hunt Groups Final Forwarding Options for Hunt Groups Configuring Night Service Using CCP Configuring Shared Ephone-Dn Using CCP Describe Extension Mobility in CME Review All the Key Topics Definitions of Key Terms

Part III Cisco Unified Communications Manager
Chapter 8 Administrator and End-User Interfaces
Describe the CUC Administration Interfaces Cisco Unity Connection Administration Cisco Unity Connection Serviceability Describe the Cisco Unified CM IM and Presence Server Administration Interfaces Cisco CM-IM and Presence Administration Interface Cisco Unified IM and Presence Serviceability Describe the End-User Interface for CUCM Review All the Key Topics Definitions of Key Terms

Chapter 9 Managing Endpoints and End Users in CUCM
Implementing IP Phones in CUCM Special Functions and Services Used by IP Phones NTP CDP DHCP PoE TFTP DNS IP Phone Registration Process SIP Phone Registration Process Preparing CUCM to Support Phones Service Activation DHCP Server Configuration Configuring DHCP in Router IOS IP Phone Configuration Requirements in CUCM Device Pool Device Defaults Softkey Template and Phone Button Template Profiles Adding Phones in CUCM Manual Configuration of IP Phones Auto-Registration of IP Phones Bulk Administration Tool Auto Register Phone Tool Self-Provisioning Describe End Users in CUCM End Users Versus Application Users Credential Policy Features Interacting with User Accounts User Locale Device Association Implementing End Users in CUCM Manual Entry Bulk Import Using BAT LDAP Integration LDAP Synchronization LDAP Authentication LDAP Integration Considerations LDAP Sync Agreements LDAP Sync Mechanism LDAP Custom Filters Configure LDAP Sync
Chapter 10 Understanding CUCM Dial Plan Elements and Interactions

CUCM Call Flows
- Call Flow in CUCM If DNS Is Used
- Call Flow in CUCM If DNS Is Not Used
- Centralized Remote Branch Call Flow
- Centralized Deployment PSTN Backup Call Flow
- Centralized Deployment Considerations and Limitations

PSTN Backup Using CAC
Distributed Deployment Call Flow
Call Routing Sources in CUCM
Call Routing Destinations in CUCM
Call Routing Configuration Elements
- Route Pattern
- Route List
- Route Group
- Gateways and Trunks

Call Routing Behavior
- Digit Analysis
- Hunt Groups
- Class of Control
- Partition
- Calling Search Space
- Interaction of Partitions and Calling Search Spaces
- Line Device Configuration

Review All the Key Topics
Definitions of Key Terms

Chapter 11 Enabling Telephony and Mobility Features with CUCM

Describe Extension Mobility in CUCM
Enable EM in CUCM
Describe Telephony Features in CUCM
Call Coverage
- Call Forward
- Shared Lines
- Barge and Privacy
- Call Pickup
- Call Hunting
- Call Park
- Intercom

CUCM Native Presence
- Presence Architecture
Enable Telephony Features in CUCM
- Enabling Call Coverage
- Configuring Shared Lines
- Configuring Barge
- Configuring Call Pickup
- Configuring Call Park and Directed Call Park
- Configuring Call Hunting

Configuring Intercom Features
- Configure CUCM Native Presence
- Configuring BLF Speed Dials
- Configuring Presence-Enabled Call Lists
- Configuring Custom Presence Groups

Review All the Key Topics
Definitions of Key Terms

Chapter 12 Enabling Mobility Features in CUCM

Understanding CUCM Mobility Features
- Describe Mobile Connect
- Unified Mobility Architecture
- Access Lists
- Time-of-Day Access
- Mobile Voice Access

Implementing Mobility Features in CUCM
- Configuring Mobile Connect
  - Step 1: Configure Softkey Templates
  - Step 2: Configure User Accounts for Mobility
  - Step 3: Configure the IP Phone to Support

Mobility Features
- Step 4: Create Remote Destination Profiles
- Step 5: Add Remote Destinations to Remote Destination Profiles

- Step 6: Configure Ring Schedules for Each Remote Destination
- Step 7: Configure Access Lists
- Step 8: Apply Access Lists
- Step 9: Configure Service Parameters

Configuring MVA
- Step 1: Activate the MVA Service
- Step 2: Configure Service Parameters
- Step 3: Enable MVA for Each User
- Step 4: Configure the MVA Media Resource
- Step 5: Configure the MVA VXML Application at the IOS Gateway

Review All the Key Topics
Definitions of Key Terms

Part IV Voicemail and Presence Solutions

Chapter 13 Voice Messaging Integration with Cisco Unity Connection
Describe Cisco Unity Connection
- Overview of Cisco Unity Connection
- Single-Site and Multisite Deployment Considerations
CUC Integration Overview
- CUC Integration with CUCM Using SCCP
- CUC Integration Using SIP
CUC Features
- System Settings
- Enterprise Parameters and Service Parameters
- LDAP
- Call Handlers
- Call Routing
- Direct Routing Rules
- Forwarded Routing Rules
- Call Routing Rule Filters
- Distribution Lists
- Authentication Rules
- Dial Plan

Describe Cisco Unity Connection Users and Mailboxes
- User Templates
  - User Template Basics
  - Password Settings
  - Roles
  - Transfer Rules and Greetings
  - Call Actions
  - Message Settings, Message Actions, and Caller Input
- TUI Settings
- CUC End Users
  - Extension and Call Forward Options
  - Voice Messaging with SRST and AAR
  - Voicemail Box
  - Private Distribution Lists
  - Notification Devices
- User Creation Options
- CUC Voicemail Boxes
  - Message Aging Policy and Mailbox Quotas

Implement Cisco Unity Connection Users and Mailboxes
- Configure End User Templates
  - User Template Basics
  - Password Settings
  - Roles
  - Message Settings
  - Message Actions
  - Phone Menu
  - Playback Message Settings
  - Notification Devices
- Configure CUC End Users
  - Manual Process
  - Alternate Extensions and Names
  - Private DLs
- Importing End Users into CUC
  - Importing Users from CUCM
  - Importing Users from LDAP
  - Bulk Administration Import of CUC Users
  - Managing the CUC Message Store
  - Mailbox Stores Membership
  - Message Aging Policy

Chapter 14 Enabling CM IM and Presence Support
- Describe CM-IMP Features
  - Jabber
    - Jabber Operating Modes
    - Enterprise Instant Messaging
    - Voice Calls
    - Video Calls
    - Integration Support
    - Cisco Unified Client Services Framework
    - Cisco Unified Communications Manager IP Phone Service
- Describe Cisco Unified Presence Architecture
  - Integration with Microsoft Office Communications Server
    - Integration with LDAP
    - Integration with Cisco Unity Connection
    - Integration with Conferencing Resources
    - Integration with Calendar Resources
    - Architecture and Call Flow: Softphone Mode
    - Architecture and Call Flow: Deskphone Control Mode
    - IM/Chat, Compliance, and Persistent Chat
    - CM-IMP and QoS Considerations

Enabling CM-IMP
- Enabling End Users for Cisco Jabber in CUCM
  - Step 1: Configure End Users in CUCM
  - Step 2: Associate the Directory Numbers with the End Users in CUCM
  - Step 3: Create a Cisco Unified CSF Device
  - Step 4: Associate the CSF Device with the End User in CUCM
- Enabling End Users for Jabber in CM-IMP
- Troubleshooting Jabber

Review All the Key Topics
Definitions of Key Terms

Part V Voice Network Management and Troubleshooting

Chapter 15 Common CME Management and Troubleshooting Issues

Troubleshooting
- Troubleshooting Common CME Registration Issues
  - Issue 1: Verifying PoE
  - Issue 2: Voice VLAN Assignment
  - Issue 3: DHCP Server
  - Issue 4: TFTP Server
  - Issue 5: CME Server
Troubleshooting Dial Plan and QoS Issues
   Dial Plan Issues
   QoS Issues
Review All the Key Topics
Definitions of Key Terms

Chapter 16 CUCM Monitoring, Maintenance, and Troubleshooting

Describe How to Provide End-User Support for Connectivity and Voice
   Quality Issues
   Troubleshooting
   Troubleshooting IP Phone Registration Problems
Deleting Unassigned Directory Numbers Using the Route Plan Report
   Describe CUCM Reports and How They Are Generated
   Generating Reports
   Analyzing Reports
   Understanding CUCM CDR Analysis and Reporting
Tool Reports
   Activate CAR-Related Services
   Configure CDR Service Parameters
      CAR Tool Users
   CDR and CMR Architecture
      CAR System Parameters
Exporting CDR and CMR Records
Generating CDR Reports
Report Generation Example
Generating System Reports
Generating Device Reports
Describe Cisco Unified RTMT
   RTMT Interface
Monitoring CUCM with RTMT
      Voice and Video Summary
      Gateway Activity
      Device Search
      Database Summary
      Call Activity
      Alert Central
Remote Browse
Syslog
Describe the Disaster Recovery System
   Using the DRS
      Set Up a Backup Device
      Create a Scheduled Backup
      Perform a Restore
Review All the Key Topics
Definitions of Key Terms

Chapter 17 Monitoring Cisco Unity Connection

Generating and Accessing Cisco Unity Connection Reports
   Cisco Unity Connection Serviceability Reports
   Cisco Unified Serviceability: Serviceability Reports Archive
Analyzing Cisco Unity Connection Reports
Troubleshooting and Maintenance Operations Using Cisco Unity Connection Reports
   Reports to Support Routine Maintenance
Review All the Key Topics
Definitions of Key Terms

Chapter 18 Final Preparation

Tools for Final Preparation
Exam Engine and Questions on the CD
   Install the Exam Engine
   Activate and Download the Practice Exam
   Activating Other Exams
   Premium Edition
The Cisco Learning Network
Memory Tables
Chapter-Ending Review Tools
Study Plan
Recall the Facts
Practice Configurations
Using the Exam Engine
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

Cisco Certified Network Professional Security (CCNP Security) Boot Camp program is aligned specifically to the job role of the Cisco Network Security Engineer responsible for Security in Routers, Switches, Networking devices and appliances, as well as choosing, deploying, supporting and troubleshooting Firewalls, VPNS, and IDS/IPS solutions for their networking environments.

Prerequisites

CCNA Security certification

Course Outline

CCNP Security Boot Camp is consisted of the following four courses:

**Implementing Cisco Secure Access Solutions (SISAS)**

Implementing Cisco Secure Access Solutions (SISAS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Identity Services Engine and 802.1X secure network access. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed network access security by utilizing Cisco ISE appliance product solution.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco Identity Services Engine architecture and access control capabilities.
- Understand 802.1X architecture, implementation and operation.
- Understand commonly implemented Extensible Authentication Protocols (EAP).
- Implement Public-Key Infrastructure with ISE.
- Understand the implement Internal and External authentication databases.
- Implement MAC Authentication Bypass.
- Implement identity based authorization policies.
- Understand Cisco TrustSec features.
- Implement Web Authentication and Guest Access.
- Implement ISE Posture service.
- Implement ISE Profiling.
- Understand Bring Your Own Device (BYOD) with ISE.
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

COURSE OUTLINE

• Troubleshoot ISE

Implementing Cisco Edge Network Security Solutions (SENSS)
Implementing Cisco Edge Network Security Solutions (SENSS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience to prepare them to configure Cisco perimeter edge security solutions utilizing Cisco Switches, Cisco Routers, and Cisco Adaptive Security Appliance (ASA) Firewalls. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls, Cisco Routers with the firewall feature set, and Cisco Switches.

Course Objectives

• Understanding and implementing Cisco modular Network Security Architectures such as SecureX and TrustSec.
• Deploy Cisco Infrastructure management and control plane security controls.
• Configuring Cisco layer 2 and layer 3 data plane security controls.
• Implement and maintain Cisco ASA Network Address Translations (NAT).
• Implement and maintain Cisco IOS Software Network Address Translations (NAT).
• Designing and deploying Cisco Threat Defense solutions on a Cisco ASA utilizing access policy and application and identity based inspection.
• Implementing Botnet Traffic Filters.
• Deploying Cisco IOS Zone-Based Policy Firewalls (ZBFW).
• Configure and verify Cisco IOS ZBFW Application Inspection Policy.

Implementing Cisco Secure Mobility Solutions (SIMOS)
Implementing Cisco Secure Mobility Solutions (SIMOS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. This course is designed to prepare network security engineers with the knowledge and skills they need to protect data traversing a public or shared infrastructure such as the Internet by implementing and maintaining Cisco VPN solutions.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

• Describe the various VPN technologies and deployments as well as the cryptographical algorithms and protocols that provide VPN security.
• Implement and maintain Cisco site-to-site VPN solutions.
• Implement and maintain Cisco FlexVPN in point-to-point, hub-and-spoke, and spoke-to-spoke IPsec VPNs.
• Implement and maintain Cisco clientless SSL VPNs.
• Implement and maintain Cisco AnyConnect SSL and IPsec VPNs.
• Implement and maintain endpoint security and dynamic access policies (DAP).
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

COURSE OUTLINE

Implementing Cisco Threat Control Solutions (SITCS)
Implementing Cisco Threat Control Solutions (SITCS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Next Generation Firewall (NGFW) as well as Web Security, Email Security and Cloud Web Security. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls utilizing Cisco Next Generation product solution which integrates Cisco Prime Security Manager for managing identity policies.

Course Objectives
Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco ASA Next-Generation Firewall (NGFW)
- Deploy Cisco Web Security appliance to mitigate malware
- Configure Web Security appliance for acceptable use controls
- Configure Cisco Cloud Web Security Connectors
- Describe Cisco Email Security Solution
- Configure Cisco Email Appliance Incoming and Outgoing Policies
- Describe IPS Threat Controls
- Configure and Implement Cisco IPS Sensor into a Network.
About this Course

You will analyze a wide range of information systems security subjects that are organized into 10 domains for CISSP exam certification.

Audience Profile

This course is intended for experienced IT security-related practitioners, auditors, consultants, investigators, or instructors, including network or security analysts and engineers, network administrators, information security specialists, and risk management professionals, who are pursuing CISSP training and certification to acquire the credibility and mobility to advance within their current computer security careers or to migrate to a related career. Through the study of all 10 CISSP CBK domains, students will validate their knowledge by meeting the necessary preparation requirements to qualify to sit for the CISSP certification exam. The CISSP exam is intentionally difficult and should not be taken lightly. Even students with years of security experience should assume that they will have additional study time after class. Because the domains are so varied, it is unlikely that any one student will have experience in all 10 domains. Additional CISSP certification requirements include a minimum of five years of direct professional work experience in one or more fields related to the 10 CBK security domains, or a college degree and four years of experience.

Prerequisites

It is highly recommended that students have certifications in Network+ or Security+, or possess equivalent professional experience upon entering CISSP training. It will be beneficial if students have one or more of the following security-related or technology-related certifications or equivalent industry experience: MCSE, MCTS, or CCNP.

Course Content

Lesson 1: Information Systems Access Control

Topic 1A: Data Access Principles
Topic 1B: System Access and Authentication
Topic 1C: Attacks and Penetration Tests

Lesson 2: Security Architecture and Design

Topic 2A: Security Architecture Frameworks and Security Models
Topic 2B: Security Modes
Topic 2C: System Assurance
Lesson 3: Network and Telecommunications Security

   Topic 3A: Data Network Design
   Topic 3B: Remote Data Access
   Topic 3C: Data Network Security
   Topic 3D: Data Network Management

Lesson 4: Information Security Management Goals

   Topic 4A: Organizational Security
   Topic 4B: The Application of Security Concepts

Lesson 5: Information Security Classification and Program Development

   Topic 5A: Information Classification
   Topic 5B: Security Program Development

Lesson 6: Risk Management and Ethics

   Topic 6A: Risk Management
   Topic 6B: Ethics

Lesson 7: Software Development Security

   Topic 7A: Software Configuration Management
   Topic 7B: Software Controls
   Topic 7C: Database System Security

Lesson 8: Cryptography

   Topic 8A: Ciphers and Cryptography
   Topic 8B: Symmetric-Key Cryptography
   Topic 8C: Asymmetric-Key Cryptography
   Topic 8D: Hashing and Message Digests
   Topic 8E: Email, Internet, and Wireless Security
   Topic 8F: Cryptographic Weaknesses

Lesson 9: Physical Security

   Topic 9A: Physical Access Control
   Topic 9B: Physical Access Monitoring
   Topic 9C: Physical Security Methods
   Topic 9D: Facilities Security

Lesson 10: Operations Security

   Topic 10A: Operations Security Control
   Topic 10B: Operations Security Auditing and Monitoring
   Topic 10C: Operational Threats and Violations
Lesson 11: Business Continuity and Disaster Recovery Planning

   Topic 11A: Business Continuity Plan Fundamentals
   Topic 11B: Business Continuity Plan Implementation
   Topic 11C: Disaster Recovery Plan Fundamentals
   Topic 11D: Disaster Recovery Plan Implementation

Lesson 12: Legal, Regulations, Compliance, and Investigations

   Topic 12A: Computer Crime Laws and Regulations
   Topic 12B: Computer Crime Incident Response

Appendix A: Mapping CISSP® Course Content to the (ISC)² CISSP Exam Objectives
The mobile age is upon us. More and more people are using tablets, smartphones, and other mobile devices to accomplish things in their personal and professional lives. As businesses embrace this trend, they need to support their employees in the use of mobile devices while protecting their own assets, such as intellectual property.

If you are already a traditional network support technician, you're well on the way to having the knowledge and skills needed to support the mobile workforce. This course builds on your existing knowledge and experience to provide you with critical concepts related to over-the-air technologies, wireless networking, and mobile devices.

Students taking this course are IT support personnel or prospective support personnel who have at least one year of experience working with computer networks, and who want to further develop their IT skills to include mobile device and wireless support.

This course is also for students seeking the CompTIA® Mobility+® certification.

Upon successful completion of this course, you will be able to support mobile cellular and wireless devices. They will:

You will:

- Configure over-the-air technologies.
- Apply RF principles.
- Implement a wireless network infrastructure.
- Implement network infrastructure devices and services.
- Implement mobile solutions.
- Prepare the enterprise for a mobile network.
- Deploy mobile devices.
- Implement mobile device operations.
- Maintain mobile device operations.
- Deploy mobile applications and related technologies.
- Implement mobile app protocols and services.
- Implement mobile security.
- Mitigate mobile network risk.
• Implement incident response.
• Troubleshoot mobile devices and networks.

Prerequisites

To ensure your success in this course, you should have experience working with computer hardware, networking, and Windows operating systems. You can obtain this level of skills and knowledge by taking the following ATG Learning courses:

• CompTIA® A+® Certification
• CompTIA® Network+® Certification

Course Outline

Lesson 1: Configuring Over-the-Air Technologies

Topic A: Mobile Networking Introduction

Topic B: Evaluate and Select Cellular Technologies

Topic C: Implement Wi-Fi Technologies

Lesson 2: Applying RF Principles

Topic A: Apply Radio Frequency Concepts

Topic B: Conduct a Site Survey and Analysis

Lesson 3: Implementing a Wireless Network Infrastructure

Topic A: Choose a Network Topology

Topic B: Describe the OSI Model

Topic C: Implement Network Ports and Protocols

Lesson 4: Implementing Network Infrastructure Devices and Services

Topic A: Implement a Firewall

Topic B: Implement Connectivity Devices and Services

Topic C: Traverse Wireless and Wired Networks

Lesson 5: Implementing Mobile Solutions

Topic D: Implement Wireless IP Traffic

Topic E: Configure Core Wireless Network TCP/IP Services

Topic F: Implement Disaster Recovery

Lesson 6: Preparing the Enterprise for a Mobile Network

Topic A: Implement the SDLC

Topic B: Prepare the Infrastructure

Lesson 7: Deploying Mobile Devices

Topic A: Manage Cellular Device Activation and Deployment
MS20466: Implementing Data Models & Reports with Microsoft SQL Server

COURSE OUTLINE

Topic B: Configure Mobile Device Peripherals

Lesson 8: Implementing Mobile Device Operations

Lesson 12: Implementing Mobile Security

Topic A: Implement Encryption Methods

Topic B: Implement Access Control

Topic C: Implement PKI

Topic D: Implement Security Monitoring

Lesson 13: Mitigating Mobile Network Risk

Topic A: Identify Risks and Threats

Topic B: Implement Mitigation Techniques

Lesson 14: Implementing Incident Response

Topic A: Identify an Incident

Topic B: Create and Execute a Policy-Based Response

Topic C: Report an Incident

Lesson 15: Troubleshooting Mobile Devices and Networks

Topic A: Implement Troubleshooting Methodology

Topic B: Troubleshoot Device Problems

Topic C: Troubleshoot Application Problems

Topic D: Troubleshoot Over-the-Air Connectivity Problems

Topic E: Troubleshoot Security Problems

Appendix A: Mapping Course Content to CompTIA Mobility+ Exam MB0-001

Appendix B: CompTIA Mobility+ Acronyms
Course 10174B: Configuring and Administering Microsoft SharePoint 2010

About this Course
This five-day instructor-led course teaches students how to install, configure, and administer Microsoft SharePoint and also how to manage and monitor sites and users by using Microsoft SharePoint 2010. It will also cover the new features and functionality introduced with SharePoint 2010 Sp1 as well as Offices 365's SharePoint Online.

Audience Profile
This course is intended for IT professionals who are experienced Windows Server 2003 or 2008 administrators and are interested in learning how to administer SharePoint 2010 or SharePoint Online. The course is also intended for part-time Business Application Administrators (BAAs) who are engaged in administering Line of Business (LOB) applications in conjunction with internal business customers.

Course Outline

Module 1: Introducing Microsoft SharePoint 2010
This module provides an overview of SharePoint 2010 and SharePoint Online. It will prepare students for the installation of the first server in a SharePoint 2010 farm and give details on SharePoint 2010 Sp1 and SharePoint Online. Lessons

- Evaluating the Features of Microsoft SharePoint 2010
- Preparing for SharePoint 2010
- Installing SharePoint 2010
- Advanced Installation of SharePoint 2010

Lab: Installing SharePoint 2010

- Exercise 1: Creating Active Directory Accounts for SharePoint
- Exercise 2: Installing SharePoint Server Prerequisites
- Exercise 3: Installing SharePoint Server
- Exercise 4: Configuring the SharePoint Installation
- Exercise 4: Configuring the SharePoint Installation
- Exercise 6 (Optional): Installing a Language Pack

After completing this module, students will be able to:

- Evaluate the Features of SharePoint 2010
- Prepare for SharePoint 2010
- Install SharePoint 2010
- Perform an Advanced Installation of SharePoint 2010

Module 2: Creating a SharePoint 2010 Intranet
This module covers creating a SharePoint 2010 Intranet and shows students how to configure and administer the fundamental components of a
SharePoint farm, including its configuration, logical structure, user-facing features, and underlying engine.

Lessons

- Performing Initial Farm Configuration
- Configuring the SharePoint Logical Structure
- Exploring the SharePoint Web Application and Physical Architecture

Lab: Creating a SharePoint 2010 Intranet

- Exercise 1: Creating a Web Application
- Exercise 2: Creating a Site Collection
- Exercise 3: Creating a Site Collection in a New Content Database

After completing this module, students will be able to:

- Perform Initial Farm Configuration
- Configure the SharePoint Logical Structure
- Explore the SharePoint Web Application and Physical Architecture

Module 3: Administering and Automating SharePoint

This module covers Administering and Automating SharePoint. It covers how to apply the full range of options for administering and automating SharePoint—Central Administration, STSADM, and PowerShell. The module also introduces students to the logs.

Lessons

- Configuring Central Administration
- Administering SharePoint from the Command Line
- Automating SharePoint Operations with Windows PowerShell

Lab: Automating SharePoint with Windows PowerShell

- Exercise 1: Adding SharePoint Functionality to Windows PowerShell
- Exercise 2: Delegating the Ability to Use Windows PowerShell to Manage SharePoint
- Exercise 3: Reporting Web and Site Collection Properties
- Exercise 4: Creating Site Collections Using Windows PowerShell
- Exercise 5: Creating and Updating Items

After completing this module, students will be able to:

- Configure Central Administration
- Administer SharePoint from the Command Line
- Automate SharePoint Operations with Windows PowerShell
Module 4: Configuring Content Management
This module covers Configuring Content Management. It explains to students how to manage content (lists, libraries, items and documents).

Lessons

• Optimizing Content Storage and Access
• Managing Site Content Types and Site Columns
• Configuring the Managed Metadata Service

Lab : Lab A: Configuring List Throttling and Remote BLOB Storage

• Exercise 1: Configuring List Throttling
• Exercise 2: Enabling FILESTREAM and Provisioning the RBS Data Store
• Exercise 3: Installing RBS on All SharePoint Web and Application Servers
• Exercise 4: Configuring the BLOB Size Threshold for RBS

Lab : Lab B: Configuring Managed Metadata

• Exercise 1: Configuring and Implementing Managed Metadata

After completing this module, students will be able to:

• Optimize Content Storage and Access
• Manage Site Content Types and Site Columns
• Configure the Managed Metadata Service

Module 5: Configuring Authentication
This module describes the process of how to administer authentication to SharePoint Web applications.

Lessons

• Understanding Classic SharePoint Authentication Providers
• Understanding Federated Authentication

Lab : Lab A: Configuring Custom Authentication

• Exercise 1: Creating and Configuring an ASP.NET Membership Database
• Exercise 2: Creating a Web Application that Uses Claims-Based Authentication

Lab : Lab B: Configuring Secure Store

• Exercise 1: Creating User Accounts for Access to External Data
• Exercise 2: Configuring Secure Store Services
• Exercise 3: Configuring Secure Store Unattended Accounts
After completing this module, students will be able to:

- Describe Microsoft SharePoint Server 2010 authentication.
- Describe SharePoint Server 2010 federated authentication.

**Module 6: Securing Content** This module details how to manage security of SharePoint content within a Web application. **Lessons**

- Administering SharePoint Groups
- Implementing SharePoint Roles and Role Assignments
- Securing and Auditing SharePoint Content
- Configuring Security for SharePoint Content

**Lab : Configuring Security for SharePoint Content**

- Exercise 1: Managing SharePoint Groups
- Exercise 2: Creating Custom Permission Levels
- Exercise 3: Managing Permissions and Inheritance
- Exercise 4: Creating a Web Application Policy

After completing this module, students will be able to:

- Administer SharePoint Groups
- Implement SharePoint Roles and Role Assignments
- Secure and Auditing SharePoint Content
- Configure Security for SharePoint Content

**Module 7: Managing SharePoint Customizations** This module enables students to manage customizations to the SharePoint environment. **Lessons**

- Customizing Microsoft SharePoint
- Deploying and Managing Features and Solutions
- Configuring Sandboxed Solutions

**Lab : Lab A: Administering Features and Solutions**

- Exercise 1: Administering Features
- Exercise 2: Administering Solutions

**Lab : Lab B: Administering Sandboxed Solutions**

- Exercise 1: Administering SandBoxed Solutions
• Exercise 2: Modifying SandBoxed Solutions Timer Jobs
• Exercise 3: Configuring Sandbox Points

After completing this module, students will be able to:

• Customize SharePoint installations to suit your organizational needs.
• Deploy and manage SharePoint features and solutions.
• Configure sandboxed solutions.

**Module 8: Configuring and Securing SharePoint Services and Service Applications** This module shows students how to manage the SharePoint service as a whole, as well as individual services and service applications.

Lessons

• Securing the Enterprise SharePoint Service
• Securing and Isolating Web Applications
• Services and Service Applications

**Lab : Lab A: Administering SharePoint Services**

• Exercise 1: Administering SharePoint Services
• Exercise 2: Administering SharePoint Windows Services

**Lab : Lab B: Configuring Application Security**

• Exercise 1: Configuring Web Application and Application Pool Security
• Exercise 2: Configuring Secure Sockets Layer Security

**Lab : Lab C: Configuring Service Applications**

• Exercise 1: Creating a Service Application

After completing this module, students will be able to:

• Secure your enterprise-level SharePoint service.
• Secure Web applications.
• Configure SharePoint services and service applications.

**Module 9: User Profiles and Social Networking** This module describes how to manage user profiles, My Sites, and social content.

Lessons

• Configuring User Profiles
• Implementing SharePoint 2010 Social Networking Features
Lab : Lab A: Configuring User Profiles

• Exercise 1: Creating a User Profile Service Application
• Exercise 2: Configuring User Profiles
• Exercise 3: Configuring Profile Import from External Data Sources

Lab : Lab B: Administering My Sites

• Exercise 1: Configuring My Sites
• Exercise 2: Creating Your My Site and Profile
• Exercise 3: Configuring Social Networking Features

After completing this module, students will be able to:

• Configure user profiles.
• Implement SharePoint 2010 social networking features.

Module 10: Administering and Configuring SharePoint Search

This module discusses how to administer and configure SharePoint Search.

Lessons

• Configuring Search
• Refining Search

Lab : Lab A: Configuring Search

• Exercise 1: Creating Content for Search
• Exercise 2: Creating an Enterprise Search Center Site
• Exercise 3: Creating and Configuring a Content Source
• Exercise 4: Configuring File Types
• Exercise 5: Configuring Search Settings
• Exercise 6: Configuring Managed Properties
• Exercise 7: Creating and Configuring a Search Scope

Lab : Lab B: Tuning SharePoint Search

• Exercise 1: Creating Keywords and Best Bets
• Exercise 2: Configuring a Thesaurus
• Exercise 3: Configuring Noise Words

After completing this module, students will be able to:

• Configure the search features of SharePoint Server 2010.
• Refine searches in SharePoint 2010.

**Module 11: Implementing Productivity Service Applications** This module enables students to configure specific service applications.

**Lessons**

• Implementing Business Connectivity Services
• Configuring Excel Services
• Understanding PerformancePoint Services
• Implementing InfoPath Forms Services
• Implementing Visio Services Features
• Implementing Access Services
• Implementing Office Web Apps

**Lab : Implementing Office Web Apps**

• Exercise 1: Installing and Configuring Office Web Apps
• Exercise 2: Configuring and Testing the Office Web Apps in a Document Library

After completing this module, students will be able to:

• Describe business connectivity services.
• Configure Excel services.
• Describe PerformancePoint Services.
• Configure InfoPath services.
• Implement Visio services.
• Implement Access services.
• Install Office Web Apps.

**Module 12: Installing and Upgrading to SharePoint 2010** This module teaches students how to install and upgrade to SharePoint 2010 in a variety of scenarios, and to keep SharePoint 2010 current.

**Lessons**

• Installing SharePoint Servers and Farms
• Upgrading to SharePoint 2010
• Evaluating Installations and Upgrades
• Configuring SharePoint Operational Settings
• Updating SharePoint

**Lab : Lab A: Preparing SharePoint 2007 for Upgrade to SharePoint 2010**

• Exercise 1: Performing SQL Server Database Maintenance
• Exercise 2: Moving a Site Collection Between Content Databases
Exercise 3: Preparing SQL Server Databases for Upgrade
Exercise 4: Preparing SharePoint 2007 for Upgrade

Lab : Lab B: Upgrading SharePoint 2007 to SharePoint 2010

Exercise 1: Upgrading SharePoint 2007 to SharePoint 2010
Exercise 2: Upgrading Content Databases
Exercise 3: Implementing a Visual Upgrade

After completing this module, students will be able to:

- Install SharePoint servers and farms.
- Upgrade SharePoint 2007 to SharePoint 2010.
- Plan SharePoint installations and upgrades.
- Configure operational settings in SharePoint 2010.
- Update SharePoint.

Module 13: Implementing Business Continuity

This module enables students to configure business continuity for SharePoint.

Lessons

- Protecting and Recovering Content
- Working with Backup and Restore for Disaster Recovery
- Implementing High Availability Solutions

Lab : Lab A: Implementing a Backup Strategy

Exercise 1: Backing Up SharePoint Using Central Administration
Exercise 2: Investigating SharePoint Backup Logs and Files
Exercise 3: Automating SharePoint Backup Using Windows PowerShell

Lab : Lab B: Implementing a Restore Strategy

Exercise 1: Restoring a Web Application Using Central Administration
Exercise 2: Investigating SharePoint Restore Logs and Files
Exercise 3: Performing a Partial Restore

After completing this module, students will be able to:

- Describe how to protect content and recover content.
- Perform backup and restore operations to mitigate against disasters.
• Implement high availability solutions with SharePoint Server.

Module 14: Monitoring and Optimizing SharePoint Performance
This module shows students how to monitor SharePoint performance, health, and usage, and to identify and remediate performance and health problems. Lessons

• Monitoring Logs
• Configuring SharePoint Health Analyzer
• Configuring Usage Reports and Web Analytics
• Monitoring and Optimizing SharePoint Performance

Lab : Lab A: Configuring SharePoint Monitoring
• Exercise 1: Configuring SharePoint Diagnostic Logging

Lab : Lab B: Analyzing SharePoint Health
• Exercise 1: Configuring Health Analyzer Rules
• Exercise 2: Reviewing and Repairing Health Analyzer Problems

Lab : Lab C: Reporting SharePoint Usage
• Exercise 1: Configuring SharePoint Usage Data Collection
• Exercise 2: Creating Reports from the Logging Database

After completing this module, students will be able to:

• Use monitoring logs to establish a baseline for performance monitoring.
• Configure SharePoint Health Analyzer.
• Configure both usage reports and Web analytics.
• Monitor your SharePoint servers’ performance and optimize them.

Module 15: SharePoint Online and Office 365
This module covers implementing sand administering Office 365 and SharePoint Online. Lessons

• Introducing Office 365 and SharePoint Online
• Setting Up Office 365
• Administering SharePoint Online

After completing this module, students will be able to:
• Describe the components of Office 365 and compare the functionality of SharePoint Online to that of a SharePoint on-premise farm.
• Create and configure an Office 365 subscription.
• Secure SharePoint Online and integrate it with on-premise systems.
Course 20462C: Administering Microsoft SQL Server Databases

About this Course

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2014 database. The course focuses on teaching individuals how to use SQL Server 2014 product features and tools related to maintaining a database.

Note: This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

Audience Profile

The primary audience for this course is individuals who administer and maintain SQL Server databases. These individuals perform database administration and maintenance as their primary area of responsibility, or work in environments where databases play a key role in their primary job.

The secondary audience for this course is individuals who develop applications that deliver content from SQL Server databases.

At Course Completion

- After completing this course, students will be able to:
- Describe core database administration tasks and tools.
- Install and configure SQL Server 2014.
- Configure SQL Server databases and storage.
- Plan and implement a backup strategy.
- Restore databases from backups.
- Import and export data.
- Monitor SQL Server.
- Trace SQL Server activity.
- Manage SQL Server security.
- Audit data access and encrypt data.
- Perform ongoing database maintenance.
- Automate SQL Server maintenance with SQL Server Agent Jobs.
- Configure Database Mail, alerts and notifications.
### Prerequisites

This course requires that you meet the following prerequisites:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.

Students who attend this training can meet the prerequisites by attending the following courses, or obtaining equivalent knowledge and skills:

- 20461C: Querying Microsoft SQL Server 2014

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### Course Outline

#### Module 1: Introduction to SQL Server 2014 Database Administration

This module introduces the Microsoft SQL Server 2014 platform. It describes the components, editions, and versions of SQL Server 2014, and the tasks that a database administrator commonly performs for a SQL Server instance.

**Lessons:** Database Administration Overview

- Introduction to the SQL Server Platform
- Database Management Tools and Techniques

**Lab:** Using SQL Server Administrative Tools

- Using SQL Server Management Studio
- Using the sqlcmd Utility
- Using Windows PowerShell with SQL Server

After completing this module, you will be able to:

- Describe the SQL Server platform.
- Describe common database administration tasks.
- Use SQL Server administration tools.

#### Module 2: Installing and Configuring SQL Server 2014

This module explains how to assess resource requirements for SQL Server 2014 and how to install it.

**Lessons:**

- Planning SQL Server Installation
- Installing SQL Server 2014
- Post-Installation Configuration

**Lab:** Installing SQL Server 2014

- Preparing to Install SQL Server
- Installing SQL Server
- Performing Post-Installation Configuration
Course 20462C: Administering Microsoft SQL Server Databases  

**COURSE OUTLINE**

**Module 3: Working with Databases and Storage**

After completing this module, you will be able to:

- Plan a SQL Server 2014 installation.
- Install SQL Server 2014.
- Perform post-installation configuration tasks.

This module describes how data is stored in databases, how to create databases, how to manage database files, and how to move them. Other tasks related to storage, include managing the tempdb database and using fast storage devices to extend the SQL Server buffer pool cache, and are also discussed.

Lessons: Introduction to Data Storage with SQL Server

- Managing Storage for System Databases
- Managing Storage for User Databases
- Moving Database Files
- Configuring the Buffer Pool Extension

Lab: Managing Database Storage

- Configuring tempdb Storage
- Creating Databases
- Attaching a Database

After completing this module, you will be able to:

- Describe how SQL Server stores data.
- Manage storage for system databases.
- Manage storage for user databases.
- Move database files.
- Configure the buffer pool extension.

**Module 4: Planning and Implementing a Backup Strategy**

In this module, you will consider how to create a backup strategy that is aligned with organizational needs, and learn how to perform the backup operations required by that strategy.

Lessons:

- Understanding SQL Server Recovery Models
- Planning a Backup Strategy
- Backing up Databases and Transaction Logs
- Using Backup Options
- Ensuring Backup Reliability

Lab:

- Backing Up SQL Server Databases
  - Backing up Database
  - Performing Database, Differential, and Transaction Log Backups
  - Performing a Partial Backup

After completing this module, you will be able to:

- Describe how database transaction logs function, and how they affect database recovery.
- Plan a backup strategy for a SQL Server database.
- Back up databases and transactions logs.
- Perform copy-only, compressed, and encrypted backups.
- Maximize backup reliability.

**Module 5: Restoring SQL Server 2014 Databases**

In this module, you will see how to restore user and system databases and how to implement point-in-time recovery.

Lessons:

- Understanding the Restore Process
Course 20462C: Administering Microsoft SQL Server Databases

COURSE OUTLINE

Module 5: Administering SQL Server Databases

• Restoring Databases
  • Advanced Restore Scenarios
  • Working with Point-in-Time Recovery

Lab: Restoring SQL Server Databases

• Restoring a Database Backup
• Restoring Database, Differential, and Transaction Log Backups
• Performing a Piecemeal Restore

After completing this module, you will be able to:

• Explain the restore process.
• Restore databases.
• Perform advanced restore operations.
• Perform a point-in-time recovery.

Module 6: Importing and Exporting Data

In this module, you will briefly explore tools and techniques so that you can import and export data to and from SQL Server.

Lessons

• Introduction to Transferring Data
• Importing and Exporting Table Data
• Copying or Moving a Database

Lab:

Importing and Exporting Data

• Using the SQL Server Import and Export Wizard
• Using the bcp Utility
• Using the BULK INSERT Statement
• Using the OPENROWSET Function

After completing this module, you will be able to:

• Describe tools and techniques for transferring data.
• Import and export data.
• Copy or move a database.

Module 7: Monitoring SQL Server 2014

This module explains how to use three of the most commonly used tools: Activity Monitor, dynamic management views and functions (DMVs and DMFs), and Performance Monitor.

Lessons

• Introduction to Monitoring SQL Server
• Dynamic Management Views and Functions
• Performance Monitor

Lab: Monitoring SQL Server 2014

• Collecting Baseline Metrics

• Monitoring a Workload

After completing this module, you will be able to:

• Describe considerations for monitoring SQL Server and use Activity Monitor.
• Use dynamic management views and functions to monitor SQL Server.
• Use Performance Monitor to monitor SQL Server.

Module 8: Tracing SQL Server Activity

This module describes how to use SQL Server Profiler and SQL Trace stored procedures to capture information about SQL Server, and how to use that information to troubleshoot and optimize SQL Server workloads.
Course 20462C: Administering Microsoft SQL Server Databases

COURSE OUTLINE

Lesson 1: Tracing SQL Server Workload Activity

- Tracing SQL Server Workload Activity
- Using Traces

Lab: Tracing SQL Server Workload Activity

- Capturing a Trace in SQL Server Profiler
- Generating Database Tuning Recommendations
- Using SQL Trace

After completing this module, you will be able to:

- Trace activity in SQL Server.
- Use captured traces to test, troubleshoot, and optimize database performance.

Module 9: Managing SQL Server Security

In this module, you will be learning about the core concepts on which the SQL Server security architecture is based, and how to manage security at the server and database levels.

Lessons

- Introduction to SQL Server Security
- Managing Server-Level Security
- Managing Database-Level Principals
- Managing Database Permissions

Lab: Managing SQL Server Security

- Managing Server-Level Security
- Managing Database-Level Security
- Testing Database Access

After completing this module, you will be able to:

- Describe core security concepts in the SQL Server security architecture.
- Manage server-level security.
- Manage database-level security principals.
- Manage database permissions.

Module 10: Auditing Data Access and Encrypting Data

This module describes the available options for auditing in SQL Server, how to use and manage the SQL Server audit feature, and how to implement encryption.

Lessons

- Auditing Data Access in SQL Server
- Implementing SQL Server Audit
- Encrypting Databases

Lab: Auditing Data Access and Encrypting Data

- Implementing Auditing
- Implementing Transparent Database Encryption

After completing this module, you will be able to:

- Describe options for auditing data access.
- Implement SQL Server audit.
- Manage SQL Server audit.
- Implement Transparent Data Encryption.

Module 11: Performing Ongoing Database Maintenance

This module describes common database maintenance tasks that a DBA must perform, and
demonstrates how to automate these tasks using maintenance plans.

Lessons

• Ensuring Database Integrity
• Maintaining Indexes
• Automating Routine Database Maintenance

Lab: Performing Ongoing Database Maintenance

• Managing Database Integrity
• Managing Index Fragmentation
• Implementing a Maintenance Plan

After completing this module, you will be able to:

• Ensure database integrity by using DBCC CHECKDB.
• Maintain indexes.
• Configure Database Maintenance Plans.

Module 12: Automating SQL Server 2014 Management

This module describes how to use SQL Server Agent to automate jobs, how to configure security contexts for jobs, and how to implement multi-server jobs.

Lessons

• Automating SQL Server Management
• Implementing SQL Server Agent Jobs
• Managing SQL Server Agent Jobs
• Managing Job Step Security Contexts
• Managing Jobs on Multiple Servers

Lab: Automating SQL Server Management

• Creating a Job
• Scheduling a Job
• Configuring Job Step Security Contexts

After completing this module, you will be able to:

• Describe methods for automating SQL Server management.
• Create jobs, job step types, and schedules.
• Manage SQL Server Agent jobs.
• Configure job security contexts.
• Configure master and target servers.

Module 13: Monitoring SQL Server 2014 by Using Alerts and Notifications

This module covers the configuration of database mail, alerts, and notifications.

Lessons

• Monitoring SQL Server Errors
• Configuring Database Mail
• Configuring Operators, Alerts, and Notifications

Lab: Monitoring SQL Server by Using Alerts and Notifications

• Configuring Database Mail
• Implementing Operators and Notifications
• Implementing Alerts

After completing this module, you will be able to:

• Configure Database Mail.
• Monitor SQL Server errors.
• Configure operators, alerts, and notifications.
**Course 20462C:** Administering Microsoft SQL Server Databases

**Length:** 5 Days  
**Audience:** IT Professionals  
**Technology:** Microsoft SQL Server 2014  
**Type:** Hands-On course  
**Delivery Method:** Instructor-led Classroom

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### About this Course

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2014 database. The course focuses on teaching individuals how to use SQL Server 2014 product features and tools related to maintaining a database.

Note: This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

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### Audience Profile

The primary audience for this course is individuals who administer and maintain SQL Server databases. These individuals perform database administration and maintenance as their primary area of responsibility, or work in environments where databases play a key role in their primary job.

The secondary audience for this course is individuals who develop applications that deliver content from SQL Server databases.

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### At Course Completion

- After completing this course, students will be able to:
  - Describe core database administration tasks and tools.
  - Install and configure SQL Server 2014.
  - Configure SQL Server databases and storage.
  - Plan and implement a backup strategy.
  - Restore databases from backups.
  - Import and export data.
  - Monitor SQL Server.
  - Trace SQL Server activity.
  - Manage SQL Server security.
  - Audit data access and encrypt data.
  - Perform ongoing database maintenance.
  - Automate SQL Server maintenance with SQL Server Agent Jobs.
  - Configure Database Mail, alerts and notifications.
Course 20462C: Administering Microsoft SQL Server Databases

COURSE OUTLINE

Prerequisites

This course requires that you meet the following prerequisites:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.

Students who attend this training can meet the prerequisites by attending the following courses, or obtaining equivalent knowledge and skills:

- 20461C: Querying Microsoft SQL Server 2014

Course Outline

Module 1: Introduction to SQL Server 2014 Database Administration

This module introduces the Microsoft SQL Server 2014 platform. It describes the components, editions, and versions of SQL Server 2014, and the tasks that a database administrator commonly performs for a SQL Server instance.

Lessons: Database Administration Overview

- Introduction to the SQL Server Platform
- Database Management Tools and Techniques

Lab: Using SQL Server Administrative Tools

- Using SQL Server Management Studio
- Using the sqlcmd Utility
- Using Windows PowerShell with SQL Server

After completing this module, you will be able to:

- Describe the SQL Server platform.
- Describe common database administration tasks.

Module 2: Installing and Configuring SQL Server 2014

This module explains how to assess resource requirements for SQL Server 2014 and how to install it.

Lessons:

- Planning SQL Server Installation
- Installing SQL Server 2014
- Post-Installation Configuration

Lab: Installing SQL Server 2014

- Preparing to Install SQL Server
- Installing SQL Server
- Performing Post-Installation Configuration

After completing this module, you will be able to:

- Plan a SQL Server 2014 installation.
- Install SQL Server 2014.
- Perform post-installation configuration tasks.
Module 3: Working with Databases and Storage

This module describes how data is stored in databases, how to create databases, how to manage database files, and how to move them. Other tasks related to storage, include managing the tempdb database and using fast storage devices to extend the SQL Server buffer pool cache, and are also discussed.

Lessons: Introduction to Data Storage with SQL Server
• Managing Storage for System Databases
• Managing Storage for User Databases
• Moving Database Files
• Configuring the Buffer Pool Extension

Lab: Managing Database Storage
• Configuring tempdb Storage
• Creating Databases
• Attaching a Database

After completing this module, you will be able to:
• Describe how SQL Server stores data.
• Manage storage for system databases.
• Manage storage for user databases.
• Move database files.
• Configure the buffer pool extension.

Module 4: Planning and Implementing a Backup Strategy

In this module, you will consider how to create a backup strategy that is aligned with organizational needs, and learn how to perform the backup operations required by that strategy.

Lessons:
• Understanding SQL Server Recovery Models
• Planning a Backup Strategy
• Backing up Databases and Transaction Logs
• Using Backup Options
• Ensuring Backup Reliability

Lab:
Back up SQL Server Databases
• Backing up Database
• Performing Database, Differential, and Transaction Log Backups
• Performing a Partial Backup

After completing this module, you will be able to:
• Describe how database transaction logs function, and how they affect database recovery.
• Plan a backup strategy for a SQL Server database.
• Back up databases and transactions logs.
• Perform copy-only, compressed, and encrypted backups.
• Maximize backup reliability.

Module 5: Restoring SQL Server 2014 Databases

In this module, you will see how to restore user and system databases and how to implement point-in-time recovery.

Lessons:
• Understanding the Restore Process
• Restoring Databases
• Advanced Restore Scenarios
• Working with Point-in-Time Recovery
### Lab: Restoring SQL Server Databases

- Restoring a Database Backup
- Restoring Database, Differential, and Transaction Log Backups
- Performing a Piecemeal Restore

After completing this module, you will be able to:

- Explain the restore process.
- Restore databases.
- Perform advanced restore operations.
- Perform a point-in-time recovery.

### Module 6: Importing and Exporting Data

In this module, you will briefly explore tools and techniques so that you can import and export data to and from SQL Server.

**Lessons**

- Introduction to Transferring Data
- Importing and Exporting Table Data
- Copying or Moving a Database

**Lab:**

Importing and Exporting Data

- Using the SQL Server Import and Export Wizard
- Using the bcp Utility
- Using the BULK INSERT Statement
- Using the OPENROWSET Function

After completing this module, you will be able to:

- Describe tools and techniques for transferring data.
- Import and export data.
- Copy or move a database.

### Module 7: Monitoring SQL Server 2014

This module explains how to use three of the most commonly used tools: Activity Monitor, dynamic management views and functions (DMVs and DMFs), and Performance Monitor.

**Lessons**

- Introduction to Monitoring SQL Server
- Dynamic Management Views and Functions
- Performance Monitor

**Lab:** Monitoring SQL Server 2014

- Collecting Baseline Metrics

After completing this module, you will be able to:

- Describe considerations for monitoring SQL Server and use Activity Monitor.
- Use dynamic management views and functions to monitor SQL Server.
- Use Performance Monitor to monitor SQL Server.

### Module 8: Tracing SQL Server Activity

This module describes how to use SQL Server Profiler and SQL Trace stored procedures to capture information about SQL Server, and how to use that information to troubleshoot and optimize SQL Server workloads.

**Lessons**

- Tracing SQL Server Workload Activity
- Using Traces
Lab: Tracing SQL Server Workload Activity

• Capturing a Trace in SQL Server Profiler
• Generating Database Tuning Recommendations
• Using SQL Trace

After completing this module, you will be able to:

• Trace activity in SQL Server.
• Use captured traces to test, troubleshoot, and optimize database performance.

Module 9: Managing SQL Server Security

In this module, you will be learning about the core concepts on which the SQL Server security architecture is based, and how to manage security at the server and database levels.

Lessons

• Introduction to SQL Server Security
• Managing Server-Level Security
• Managing Database-Level Principals
• Managing Database Permissions

Lab: Managing SQL Server Security

• Managing Server-Level Security
• Managing Database-Level Security
• Testing Database Access

Module 10: Auditing Data Access and Encrypting Data

This module describes the available options for auditing in SQL Server, how to use and manage the SQL Server audit feature, and how to implement encryption.

Lessons

• Auditing Data Access in SQL Server
• Implementing SQL Server Audit
• Encrypting Databases

Lab: Auditing Data Access and Encrypting Data

• Implementing Auditing
• Implementing Transparent Database Encryption

After completing this module, you will be able to:

• Describe options for auditing data access.
• Implement SQL Server audit.
• Manage SQL Server audit.
• Implement Transparent Data Encryption.

Module 11: Performing Ongoing Database Maintenance

This module describes common database maintenance tasks that a DBA must perform, and demonstrates how to automate these tasks using maintenance plans.

Lessons

• Describing core security concepts in the SQL Server security architecture.
• Manage server-level security.
• Manage database-level security principals.
• Manage database permissions.

• Describing common database maintenance tasks.
• Automating routine database maintenance.
Lab: Performing Ongoing Database Maintenance

• Managing Database Integrity
• Managing Index Fragmentation
• Implementing a Maintenance Plan

After completing this module, you will be able to:

• Ensure database integrity by using DBCC CHECKDB.
• Maintain indexes.
• Configure Database Maintenance Plans.

Module 12: Automating SQL Server 2014 Management

This module describes how to use SQL Server Agent to automate jobs, how to configure security contexts for jobs, and how to implement multi-server jobs.

Lessons

• Automating SQL Server Management
• Implementing SQL Server Agent Jobs
• Managing SQL Server Agent Jobs
• Managing Job Step Security Contexts
• Managing Jobs on Multiple Servers

Lab: Automating SQL Server Management

• Creating a Job
• Scheduling a Job
• Configuring Job Step Security Contexts

After completing this module, you will be able to:

• Describe methods for automating SQL Server management.
• Create jobs, job step types, and schedules.
• Manage SQL Server Agent jobs.
• Configure job security contexts.

Module 13: Monitoring SQL Server 2014 by Using Alerts and Notifications

This module covers the configuration of database mail, alerts, and notifications.

Lessons

• Monitoring SQL Server Errors
• Configuring Database Mail
• Configuring Operators, Alerts, and Notifications

Lab: Monitoring SQL Server by Using Alerts and Notifications

• Configuring Database Mail
• Implementing Operators and Notifications
• Implementing Alerts

After completing this module, you will be able to:

• Configure Database Mail.
• Monitor SQL Server errors.
• Configure operators, alerts, and notifications.
# About this Course

This course offers students an introduction to Oracle Database 11g database technology. In this class students learn the concepts of relational databases and the SQL programming language. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, create database objects, and query meta data.

In addition, the advanced features of SQL needed to query and manipulate data within the database are taught. Schema objects that are useful for data warehousing and other application areas are discussed in detail. Students learn about manipulating large data sets and storing and retrieving dates according to different time zones.

### Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Forms Developers
- Portal Developers
- Business Intelligence Developers
- End Users
- Application Developers
- PL/SQL Developers

### At Course Completion

After completing this course students will be able to:

- Retrieve row and column data from tables with the SELECT statement.
- Employ SQL functions to generate and retrieve customized data.
- Run data manipulation statements (DML) to update data in the Oracle Database 11g.
- Control user access and manage schema objects
- Search data using advanced sub queries

### Prerequisites

Before attending this course, students must have:

- Familiarity with data processing concepts and techniques.
- Ability to use a graphical user interface (GUI).
Introducing Oracle Database 11g
• List the features of Oracle Database 11g
• Discuss the basic design, theoretical and physical aspects of a relational database
• Categorize the different types of SQL statements
• Describe the data set used by the course
• Log onto the database using the SQL Developer environment
• Save queries to files and use script files in SQL Developer

Retrieving Data Using the SQL SELECT Statement
• List the capabilities of SQL SELECT statements
• Generate a report of data from the output of a basic SELECT statement
• Select All Columns
• Select Specific Columns
• Use Column Heading Defaults
• Use Arithmetic Operators
• Understand Operator Precedence
• Learn the DESCRIBE command to display the table structure

Restricting and Sorting Data
• Write queries that contain a WHERE clause to limit the output retrieved
• List the comparison operators and logical operators that are used in a WHERE clause
• Describe the rules of precedence for comparison and logical operators
• Use character string literals in the WHERE clause
• Write queries that contain an ORDER BY clause sort the output of a SELECT statement
• Sort output in descending and ascending order

Using Single-Row Functions to Customize Output
• Describe the differences between single row and multiple row functions
• Manipulate strings with character function in the SELECT and WHERE clauses

• Manipulate numbers with the ROUND, TRUNC and MOD functions
• Perform arithmetic with date data
• Manipulate dates with the date functions

Using Conversion Functions and Conditional Expressions
• Describe implicit and explicit data type conversion
• Use the TO_CHAR, TO_NUMBER, and TO_DATE conversion functions
• Nest multiple functions
• Apply the NVL, NULLIF, and COALESCE functions to data
• Use conditional IF THEN ELSE logic in a SELECT statement

Reporting Aggregated Data Using the Group Functions
• Use the aggregation functions in SELECT statements to produce meaningful reports
• Create queries that divide the data in groups by using the GROUP BY clause
• Create queries that exclude groups of date by using the HAVING clause

Displaying Data From Multiple Tables
• Write SELECT statements to access data from more than one table
• View data that generally does not meet a join condition by using outer joins
• Join a table by using a self-join

Using Sub-queries to Solve Queries
• Describe the types of problem that sub-queries can solve
• Define sub-queries
• List the types of sub-queries
• Write single-row and multiple-row sub-queries

Using the SET Operators
• Describe the SET operators
- Use a SET operator to combine multiple queries into a single query
- Control the order of rows returned when using the SET operators

**Manipulating Data**
- Describe each DML statement
- Insert rows into a table with the INSERT statement
- Use the UPDATE statement to change rows in a table
- Delete rows from a table with the DELETE statement
- Save and discard changes with the COMMIT and ROLLBACK statements
- Explain read consistency
- Using DDL Statements to Create and Manage Tables
  - Categorize the main database objects
  - Review the table structure
  - List the data types available for columns
  - Create a simple table
  - Decipher how constraints can be created at table creation
  - Describe how schema objects work

**Creating Other Schema Objects**
- Create a simple and complex view
- Retrieve data from views
- Create, maintain, and use sequences
- Create and maintain indexes
- Create private and public synonyms

**Controlling User Access**
- Differentiate system privileges from object privileges
- Grant privileges on tables
- View privileges in the data dictionary
- Grant roles
- Distinguish between privileges and roles

**Managing Schema Objects**
- Add constraints
- Create indexes
- Create indexes using the CREATE TABLE statement
- Create function-based indexes
- Drop columns and set column UNUSED
- Perform FLASHBACK operations
- Create and use external tables

**Managing Objects with Data Dictionary Views**
- Explain the data dictionary
- Find table information
- Report on column information
- View constraint information
- Find view information
- Verify sequence information
- Understand synonyms
- Add comments

**Manipulating Large Data Sets**
- Manipulate data using sub-queries
- Describe the features of multi-table inserts
- Use the different types of multi-table inserts
- Merge rows in a table
- Track the changes to data over a period of time

**Managing Data in Different Time Zones**
- Use data types similar to DATE that store fractional seconds and track time zones
- Use data types that store the difference between two date-time values
- Practice using the multiple data-time functions for globalize applications

**Retrieving Data Using Sub-queries**
- Write a multiple-column sub-query
- Use scalar sub-queries in SQL
- Solve problems with correlated sub-queries
• Update and delete rows using correlated sub-queries
• Use the EXISTS and NOT EXISTS operators
• Use the WITH clause

<table>
<thead>
<tr>
<th>Regular Expression Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• List the benefits of using regular expressions</td>
</tr>
<tr>
<td>• Use regular expressions to search for, match, and replace strings</td>
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</tbody>
</table>
Programming with the Microsoft .NET Framework (Microsoft Visual C# .NET)
Course#: MS2349

About this Course

The goal of this course is to help application developers understand the Microsoft .NET Framework. In addition to offering an overview of the .NET Framework and an introduction to key concepts and terminology, the course provides a series of labs, which introduce and explain .NET Framework features that are used to code, debug, tune, and deploy applications.

Audience Profile

This course is intended for experienced, professional software developers including those employed by independent software vendors or those who work on corporate enterprise development teams. Most students will be Microsoft Visual C++ (or C++) and Java developers.

At Course Completion

At the end of the course, students will be able to:

- List the major elements of the .NET Framework and explain how they fit into the .NET platform.
- Explain the main concepts behind the common language runtime and use the features of the .NET Framework to create a simple application.
- Create and use components in Windows Forms-based and ASP.NET-based applications.
- Use the deployment and versioning features of the .NET runtime to deploy multiple versions of a component.
- Create, use, and extend types by understanding the Common Type System architecture.
- Create classes and interfaces that are functionally efficient and appropriate for given programming scenarios.
- Use the .NET Framework class library to efficiently create and manage strings, arrays, collections, and enumerators.
- Use delegates and events to make an event-sender object signal the occurrence of an action to an event-receiver object.
- Describe and control how memory and other resources are managed in the .NET Framework.
- Read from and write to data streams and files.
- Use the basic request/response model to send and receive data over the Internet.
- Serialize and deserialize an object graph.
- Create distributed applications by means of XML Web services and Object Remoting.

Prerequisites

Before attending this course, students should be experienced professional software developers and have a basic understanding of the C# language.
# Course Outline

## Module 1: Overview of the Microsoft .NET Framework

The following topics are covered in this module:

### Lessons
- Overview of the Microsoft .NET Framework
- Overview of Namespaces

After completing this module, students will be able to:
- Describing the .NET Framework and its components.
- Explaining the relationship between the .NET Framework class library and namespaces.

## Module 2: Introduction to a Managed Execution Environment

- Writing a .NET Application
- Compiling and Running a .NET Application

After completing this module, you will be able to explain the main concepts behind the common language runtime and use the features of the common language runtime to create a simple application.

This includes:
- Creating simple console applications in C#.
- Explaining how code is compiled and executed in a managed execution environment.
- Explaining the concept of garbage collection.

## Module 3: Working with Components

The following topics are covered in this module:

### Lessons
- An Introduction to Key .NET Framework Development Technologies
- Creating a Simple .NET Framework Component

After completing this module, you will be able to create and use components in Windows Form-based and ASP.NET-based applications. This includes:
- Creating a Simple Console Client
- Creating an ASP.NET Client

## Module 4: Deployment and Versioning

The following topics are covered in this module:

### Lessons
- Introduction to Application Deployment
- Application Deployment Scenarios
- Related Topics and Tools

After completing this module, you will be able to use the deployment and versioning features of the .NET common language runtime to deploy multiple versions of a component. This includes:
- Packaging and deploying simple and componentized applications.
- Creating strong-named assemblies.
- Installing and removing assemblies from the global assembly cache.
- Configuring applications to control binding based on assembly location and version data.

## Module 5: Common Type System

The following topics are covered in this module:

### Lessons
- An Introduction to the Common Type System
- Elements of the Common Type System


- Object-Oriented Characteristics

After completing this module, you will be able to create, use, and extend types. This includes:

- Describing the difference between value types and reference types.
- Explaining the purpose of each element in the type system, including values, objects, and interfaces.
- Explaining how object-oriented programming concepts, such as abstraction, encapsulation, inheritance, and polymorphism, are implemented in the Common Type System.

Module 6: Working with Types

The following topics are covered in this module:

Lessons

- System.Object Class Functionality
- Specialized Constructors
- Type Operations
- Interfaces
- Managing External Types

After completing this module, you will be able to create classes and interfaces that are functionally efficient and appropriate for given programming scenarios. This includes:

- Applying attributes to control visibility and inheritance in classes and interfaces.
- Creating and using interfaces that define methods and properties.
- Explaining how boxing and unboxing work and when boxing and unboxing occur.
- Using operators to determine types at run time and to cast values to different types.
- Explaining what features are available to work with unmanaged types, such as COM types.

Module 7: Strings, Arrays, and Collections

The following topics are covered in this module:

Lessons

- Strings
- Terminology - Collections
- .NET Framework Arrays
- .NET Framework Collections

After completing this module, you will be able to use the .NET Framework class library to create and manage strings, arrays, collections, and enumerators. This includes:

- Parsing, formatting, manipulating, and comparing strings.
- Using the classes in the System.Array and System.Collections namespaces.
- Improving the type safety and performance of collections by using specialized collections and class-specific code.

Module 8: Delegates and Events

The following topics are covered in this module:

Lessons

- Delegates
- Multicast Delegates
- Events
- When to Use Delegates, Events, and Interfaces

After completing this module, you will be able to use delegates and events to have an event sender object signal the occurrence of an action to an event receiver object. This includes:

- Using the delegate class to create type-safe callback functions and event-handling methods.
- Using the event keyword to simplify and improve the implementation of a class that raises events.
- Implementing events that conform to the .NET Framework guidelines.

Module 9: Memory and resource Management

The following topics are covered in this module:

Lessons

- Memory Management Basics
- Non-Memory Resource Management
• Implicit Resource Management
• Explicit Resource Management
• Optimizing Garbage Collection

After completing this module, you will be able to describe and control how memory and other resources are managed in the .NET Framework. This includes:

• Describing how garbage collection manages object memory.
• Implicitly managing non-memory resources by using a destructor's finalize code.
• Explicitly managing non-memory resources by using client-controlled deterministic release of resources.
• Writing code by using the temporary resource usage design pattern.
• Programmatically controlling the behavior of the garbage collection.
• Describing advanced garbage collection features.

Module 10: Data Streams and Files
The following topics are covered in this module:
Lessons

• Streams
• Readers and Writers
• Basic File I/O

After completing this module, you will be able to read from and write to data streams, files, and the Internet. This includes:

• Using Stream objects to read and write bytes to backing stores, such as strings and files.
• Using BinaryReader and BinaryWriter objects to read and write primitive types as binary values.
• Using StreamReader and StreamWriter objects to read and write characters to a stream.
• Using StringReader and StringWriter objects to read and write characters to strings.
• Using Directory and DirectoryInfo objects to create, move, and enumerate through directories and subdirectories.

Module 11: Internet Access
The following topics are covered in this module:
Lessons

• Internet Application Scenarios
• The WebRequest and WebResponse Model
• Application Protocols
• Handling Errors
• Security
• Best Practices

After completing this module, you will be able to use the .NET Framework classes to work with data over the Internet. This includes:

• Using the basic request/response model to send and receive data over the Internet.
• Using the System.Net classes to communicate with other applications by using the Hypertext Transfer Protocol (HTTP), Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Socket Internet protocols.

Module 12: Serialization
The following topics are covered in this module:
Lessons

• Serialization Scenarios
• Serialization Attributes
• Object Graph
• Serialization Process
• Serialization Example
• Deserialization Example
• Custom Serialization
• Custom Serialization Example
• Security Issues

After completing this module, you will be able to serialize and deserialize an object graph. This includes:
• Writing an application that serializes and deserializes an object graph by using either a binary or Simple Object Access Protocol (SOAP) XML format.

Module 13: Remoting and XML Web Services
The following topics are covered in this module:
Lessons

• Remoting
• Remoting Configuration Files
• XML Web Services

After completing this module, you will be able to create distributed applications by means of XML Web services and Object Remoting. This includes:

• Writing and configuring distributed applications that use .NET Remoting.
• Creating an XML Web service by using Visual Studio .NET and ASP.NET.
• Consuming an XML Web service by using the Web Services Description Language tool (Wsd1.exe).
Developing Microsoft.NET Applications for Windows (Visual C#.NET)
Course 2555A

Length: 5 Days
Audience: IT Professionals
Technology: Microsoft Visual Studio .NET
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course

This five-day, instructor-led course provides students with the skills required to build Microsoft Windows Forms applications by using the Microsoft .NET Framework. This course is a part of the Microsoft Visual C# .NET curriculum and is intended to provide C# programmers with the skills required to create Windows Forms applications by using the .NET Framework. The course will cover the major topics for Windows client application programming on the .NET Framework. These topics include: Windows Forms, GDI+, simple data access, interoperating with unmanaged code, threading and asynchronous programming issues, simple remoting, Web access, Web Services consumption, debugging, security, and deployment issues for desktop applications.

Audience Profile

This course is intended for the intermediate programmer who is responsible for designing and building Windows-based applications with the .NET Framework. It is designed for developers who have C# development skills. Students are required to have the following skills:

- Experience with a .NET language such as Visual C# .NET or Microsoft Visual C++ .NET
- Experience developing basic applications with MFC and/or Microsoft Visual Basic 6.0

Typically, these individuals perform the following key activities:

- Help create functional specifications.
- Design and develop user interfaces.
- Create and test prototypes.
- Write Windows Forms applications.

At Course Completion

After completing this course, students will be able to:

- Create and populate Windows Forms.
- Organize controls on Windows Forms.
- Create menus in a Windows Forms application.
- Add code to form and control event procedures in a Windows Forms application.
- Create Multiple Document Interface (MDI) applications.
- Use dialog boxes in Windows Forms applications.
- Validate user input in a Windows Forms application.
- Create and use user controls in a Windows Forms application.
- Create licenses for controls.
- Bind Windows Forms applications to various data sources by using Microsoft ADO.NET.
- Consume XML Web services from Windows Forms applications.
MS2555: Developing Microsoft .NET Applications for Windows

COURSE OUTLINE

- Use .NET and COM components in a Windows Forms application.
- Call Microsoft Win32 APIs from a Windows Forms application.
- Print documents in a Windows Forms application.
- Make asynchronous calls to methods from a Windows Forms application.
- Debug a Windows Forms application.
- Incorporate accessibility features in a Windows Forms application.
- Localize a Windows Forms application.
- Add support for Help to localize a Windows Forms application.
- Create Help files in a Windows Forms application.
- Deploy a Windows Forms application.
- Implement code access and role-based security in a Windows Forms application.
- Add deployment flexibility to applications by using shared assemblies.

Prerequisites

The course assumes that students have the following skills:

- Understanding of C# programming
- Experience building applications

Course Outline

Module 1: Introducing Windows Forms

Lessons

- Creating a Form
- Adding Controls to a Form
- Creating an Inherited Form
- Organizing Controls on a Form
- Creating MDI Applications

Lab: Creating Windows Forms

- Creating a New Windows Form
- Inheriting a New Form from an Existing Windows Form

After completing this module, students will be able to:

- Create a form and add controls to it.
- Create an inherited form by using Visual Inheritance.
- Organize controls on a form.
- Create Multiple Document Interface (MDI) applications.

Module 2: Working with Controls

This module explains how to create event procedures (handlers) in your application that will run in response to user actions. Students will learn how to add programming logic to the event procedures of a control, how to use the Windows Forms intrinsic controls, dialog boxes, and menus, and how to validate the data entered by users of your application.

Lessons

- Creating an Event Handler for a Control
- Using Windows Forms Controls
- Using Dialog Boxes in a Windows Forms Application
- Adding Controls at Run Time
- Creating Menus
- Validating User Input

Lab: Working with Controls

- Creating and Using Controls

After completing this module, students will be able to:
• Create an event handler for a control.
• Select and use the appropriate controls in a Windows Forms application.
• Use dialog boxes in a Windows Forms application.
• Add controls to a form at run time.
• Create and use menus in a Windows Forms application.
• Validate user input in a Windows Forms application.

Module 3: Building Controls
This module explains how to extend the functionality of an existing Windows control, combine multiple existing controls into a composite control, and build a new custom control. Students will also learn how to add design-time licensing support to a control.

Lessons
• Extending and Creating Controls
• Adding Design-Time Support for Controls
• Licensing a Control

Lab: Building Controls
• Declare an Event and Raising It from an Extended Control
• Creating a Composite Control
• Adding Design-Time Support

After completing this module, students will be able to:
• Extend an existing control.
• Create a composite control by combining functionality of several existing Windows Forms controls.
• Describe the design-time support options for components provided by Visual Studio .NET.
• Add attributes that provide information to the Visual Designer.
• Create and validate licenses for controls.

Module 4: Using Data in Windows Forms Applications
This module explains how to bind Windows forms to various data sources by using ADO .NET. Students will learn about binding Windows forms to data from sources such as databases and XML files. Students will get an overview of the XML Web services programming model and learn how to create applications that use XML Web services. The module also provides an overview of how to persist data to and read data from files and isolated storage.

Lessons
• Adding ADO.NET Objects to and Configuring ADO.NET Objects in a Windows Forms Application
• Accessing and Modifying Data by Using DataSets
• Binding Data to Controls
• Overview of XML Web Services
• Creating a Simple XML Web Services Client
• Persisting Data

Lab: Accessing Data with ADO.NET
• Generating and Populating DataSets
• Modifying a DataSet
• Updating a DataSet to a DataSource
• Binding and Formatting Data in Controls

Lab: Calling an XML Web Service
• Calling an XML Web Service

After completing this module, students will be able to:
• Describe the objects in the ADO.NET object model.
• Add and configure ADO.NET objects in a Windows Forms application.
• Access and modify data from a database by using DataSets.
• Bind data to controls.
• Describe the XML Web services model and the roles of HTML, SOAP, and XML in the XML Web services model.
• Create and test a simple XML Web service client application.
• Persist data to files, serialize objects, use isolated storage, and persist application settings.

**Module 5: Interoperating with Managed Objects**
This module explains how to use .NET and COM components in a Windows Forms application. Students will also learn how to call Win32 APIs in their Windows Forms application.

Lessons

- Using .NET and COM Components in a Windows Forms Application
- Calling Win32 APIs from Windows Forms Applications

Lab : Interoperating with COM and Calling Win32 APIs

- Using a COM Component in a .NET-Based Application
- Calling Win32 APIs from a .NET-Based Application

After completing this module, students will be able to:

- Use .NET and COM components in a Microsoft .NET Framework Windows Forms application.
- Call Win32 APIs from a Windows Forms application.

**Module 6: Printing and Reporting in Windows Forms Applications**

Lessons

- Printing From a Windows Forms Application
- Using the Print Preview, Page Setup, and Print Dialogs
- Constructing Print Document Content by Using GDI+
- Creating Reports by Using Crystal Reports

Lab : Printing Formatted Documents

- Adding Print Support to an Application
- Creating Printed Output by Using GDI+

After completing this module, students will be able to:

- Print documents in a Windows Forms application.
- Use the Visual Studio .NET printing dialog boxes in a Windows Forms application.
- Use GDI+ to construct print document content.
- Create and format reports by using Crystal Reports.

**Module 7: Asynchronous Programming**

This module explains how to use the techniques of asynchronous programming and multithreading to avoid blocking the user interface of an application.

Lessons

- The .NET Asynchronous Programming Model
- The Asynchronous Programming Model Design Pattern
- How to Make Asynchronous Calls to Any Method
- Helping Protect State and Data in a Multithreaded Environment

Lab : Making Asynchronous Calls to an XML Web Service

- Converting Synchronous Calls to Asynchronous Calls

After completing this module, students will be able to:

- Describe the .NET Framework asynchronous programming model.
- Modify a client application to use built-in .NET Framework support for asynchronous calls to methods.
- Describe how to add explicit support for asynchronous calls to any method.

**Module 8: Enhancing the Usability of Applications**
This module covers how to use the accessibility, Help, and localization features available in the .NET Framework.

Lessons
- Adding Accessibility Features
- Adding Help to an Application
- Localizing an Application

Lab: Enhancing the Usability of an Application
- Adding Support for Accessibility
- Adding Help to an Application
- Adding ToolTips to an Application
- Localizing the User Interface of an Application
- Localizing Resources in an Application

After completing this module, students will be able to:
- Use .NET Framework features to add and enable accessibility features in an application.
- Add support for context-sensitive Help, Help menus, and ToolTips to an application.
- Use localization properties and resource files to create a localized version of a .NET Framework Windows Forms application.

Module 9: Deploying Windows Forms Applications
This module explains assemblies and how to use strong-named assemblies and the Global Assembly Cache (GAC) in the .NET Framework. Students will also learn how to configure and deploy .NET-based applications.

Lessons
- .NET Assemblies
- Deploying Windows Forms Applications

Lab: Deploying an Application
- Building and Referencing a Strong-Named Assembly
- Installing a Strong-Named Assembly into the Global Assembly Cache

- Deploying a .NET Application
- Using an Application Configuration File

After completing this module, students will be able to:
- Use strong-named assemblies in .NET applications.
- Use application configuration files to configure and use Microsoft Windows Installer 2.0 to package and deploy .NET applications.

Module 10: Securing Windows Forms Applications
This module explains the .NET Framework security model. Students will learn how to use .NET Framework security features in Windows Forms applications.

Lessons
- Security in the .NET Framework
- Using Code Access Security
- Using Role-Based Security

Lab: Adding and Testing Permission Requests
- Adding and Testing Permission Requests

After completing this module, students will be able to:
- Describe the .NET Framework security model.
- Use code access security to help protect an application.
- Use role-based security to help control access to an application.
Introduction to C# Programming with Microsoft .NET
Course#: MS2609

About this Course

In this five-day instructor-led course, developers learn the fundamental skills that are required to design and develop object-oriented applications for the Web and Microsoft Windows by using Microsoft Visual C# .NET and the Microsoft Visual Studio .NET development environment. This course provides an alternative entry point for less experienced programmers who are not familiar with object-oriented design and programming with Windows or the Web.

Audience Profile

This course is intended for:

- Developers who are not familiar with object-oriented programming.
- Developers who understand computer programming, but may have learned programming by using a non-graphical language in a university.

These developers want to build highly functional Web and Windows solutions and Web Services by using Microsoft Visual C# .NET and the Microsoft .NET Framework.

At Course Completion

After completing this course, students will be able to:

- Explain the .NET platform.
- Configure and use Visual Studio .NET.
- Program with C#.
- Implement methods.
- Implement encapsulation, inheritance, and polymorphism in C#.
- Use C# within the .NET Framework.
- Use Microsoft ADO.NET to access and manipulate data in a database.
- Create feature-rich Windows-based applications.
- Create a Web application by using Web Forms.
- Use XML Web services in a C# application.
- Experiment with more advanced features of C#.

Prerequisites

Experience with object-oriented programming and concept is not required for this course. Before attending this course, students must have competency in the following areas:

- Familiarity and comfort with basic operating system functions such as file manipulation.
• Understanding of the basics of structured programming, including concepts such as flow control, variables and parameters, and function calls.
• At least three months experience developing applications in either a graphical or non-graphical environment, or equivalent knowledge.

**Course Outline**

**Module 1: Getting Started**
This module presents the concepts that are central to the Microsoft .NET Framework and platform, and the Microsoft Visual Studio .NET integrated development environment (IDE); describes how to work in the development environment; and explains how to use Visual Studio .NET to create and build applications based on Microsoft .NET.

**Lessons**
- Introduction to .NET and the .NET Framework
- Exploring Visual Studio .NET
- Creating a Windows Application Project

After completing this module, students will be able to:
- Identify components of the .NET platform and the .NET Framework by their function.
- Explore the Visual Studio development environment.
- Create a basic application based on Microsoft Windows.

**Module 2: Understanding C# Language Fundamentals**
This module explains the syntax and structure of the C# programming language. These topics are essential for students to understand in order to be successful in the remainder of the course; however, it is likely that most students will come into the class with some experience applying these concepts in other languages.

**Lessons**
- Understanding the Fundamentals of a C# Program
- Using C# Predefined Types
- Writing Expressions

**Module 3: Creating Objects in C#**
This module introduces the fundamentals of object-oriented programming, including the concepts of objects, classes, and methods.

**Lessons**
- Defining a Class
- Declaring Methods
- Using Constructors
- Using Static Class Members

**Lab : Creating Classes in C#**
- Creating the Bank Account Objects

After completing this module, students will be able to:
- Define a class.
- Declare methods.
- Use constructors.
- Use static class members.
Module 4: Implementing Object-Oriented Programming Techniques in C#
This module introduces the fundamentals of object-oriented programming, including the concepts of objects, classes, and methods.
Lessons
- Designing Objects
- Using Inheritance
- Using Polymorphism
Lab: Creating Classes in C#
- Creating the Bank Account Objects
After completing this module, students will be able to:
- Encapsulate information in an object.
- Create an object that inherits functionality from another object.
- Implement polymorphism to use abstract classes.

Module 5: Programming with C#
This module introduces various data structures, including arrays (the System, Array class) and collections (classes in the System, Collections namespace), and explains when to use each of these data structures in an application. The module also introduces interfaces, describes the concepts and syntax of exception handling, and explains delegates and their use in event handling.
Lessons
- Using Arrays
- Using Collections
- Using Interfaces
- Using Exception Handling
- Using Delegates and Events
Lab: Using Arrays
- Sorting Numbers in an Array
Lab: Using Indexers and Interfaces

Module 6: Building .NET-based Applications with C#
This module presents the Microsoft .NET Framework class library, the Object Browser, and methods that are inherited from the System.Object class. This module also explains how to format strings and numbers and how to use streams and files.
Lessons
- Examining the .NET Framework Class Library
- Overriding Methods from System.Object
- Formatting Strings and Numbers
- Using Streams and Files
Lab: Using Streams
- Converting a Binary File to a Text File
After completing this module, students will be able to:
- Identify a namespace in the .NET Framework class library by its function.
- Override and implement the ToString method.
- Format strings, currency, and date values.
- Read and write both binary and text files.
Module 7: Using ADO.NET to Access Data
This module explains how to use Microsoft ADO.NET and the objects in the System.Data namespace to access data in a database. It describes how to create an application based on Microsoft Windows that uses ADO.NET. This module also describes how to use that application to connect to a database, create a query, and use a DataSet object to manage the data, bind data to controls, and insert, update, and delete records in a database.

Lessons
- ADO.NET Architecture
- Creating an Application That Uses ADO.NET to Access Data
- Changing Database Records

Lab: Creating a Data Access Application with ADO.NET
- Creating a Simple Database Table Viewer
- Writing a Simple Database Table Viewer
- (If time permits): Creating a Simple Database Table Viewer

Lab: Creating a Windows Application That Uses ADO.NET
- Creating a Windows Application That Uses ADO.NET
- (If time permits): Writing an ADO.NET Application with Windows Forms

After completing this module, students will be able to:
- Describe ADO.NET.
- Create a Windows-based application that uses ADO.NET.
- Connect to a database.
- Create a query.
- Use a DataSet object to manage data.
- Bind a DataGrid object to a data source.
- Insert, update, and delete a database record.

Module 8: Creating Windows-based Applications
This module describes how to create menus, common and custom dialog boxes, status bars, and toolbars to enhance the usability of an application based on Microsoft Windows. The purpose of this module is to allow the students to apply their newly acquired C# language skills and develop useful Windows-based applications.

Lessons
- Creating the Main Menu
- Creating and Using Common Dialog Boxes
- Creating and Using Custom Dialog Boxes
- Creating and Using Toolbars
- Creating the Status Bar
- Creating and Using Combo Boxes

Lab: Building Windows Applications
- Adding Common Dialog Boxes to an Application
- Creating and Using Custom Dialog Boxes
- Creating a Status Bar
- (If Time Permits): Using ComboBox Controls

After completing this module, students will be able to:
- Create the main menu.
- Create and use common dialog boxes.
- Create and use custom dialog boxes.
- Create and use toolbars.
- Create the status bar.
- Create and use combo boxes.

Module 9: Using XML Web Services in a C# Program
The module introduces the System.Web.Services namespace and the process of building and consuming XML Web services in a C# application.

Lessons
- Consuming an XML Web Service
- Building an XML Web Service

Lab: Using XML Web Services
• Writing the Office Building Estimation Application

After completing this module, students will be able to:

• Request data from an XML Web service from within a C# application.
• Build an XML Web service.

Module 10: Creating a Web Application with Web Forms
In this module, students learn that in Microsoft Visual Studio .NET, you can use Web Forms to create programmable Web pages. This module introduces the System.Web.UI namespace and describes how to create a Web application with a Web Form. Students learn how to add controls to a Web Form and then use the Web Form to submit data and respond to events. The module also covers Microsoft ASP.NET state management, security, and configuration settings.

Lessons
• Creating a Web Forms Application
• Accessing Data by Using a Web Forms Application
• Configuring ASP.NET Application Settings

Lab: Developing an ASP.NET Web Application

• Completing the User Authentication Validation Code
• Completing the Code for the Master.aspx Form
• Testing the Application

After completing this module, students will be able to:

• Create a Web Forms application.
• Handle events on a Web Forms application.
• Access data from a Web Forms application.
• Configure ASP.NET application settings.

Module 11: Application Settings and Deployment
This module introduces the procedures that are involved in deploying a C# application by using Microsoft Visual Studio .NET. It explains how to deploy both Web-based applications and applications that are based on Microsoft Windows. It also describes how to store user preferences and configure application settings.

Lessons
• Working with Application Settings
• Deploying Applications

Lab: Deploying an Application

• Adding a Setup Project to an Existing Application
• Installing and Testing the Setup Application

Lab: Working with Application Settings

• Adding the UserPreferences Class
• Adding User Preferences to the Form Load Event
• Adding User Preferences to the loadItem_Click Event
• Declaring an Instance of the UserPreferences Class in the Options Form
• Setting the Checkbox Controls to the Values Contained in the Registry
• Save the Checkbox Controls Values to the Registry
• Testing the Zoo Information Application

After completing this module, students will be able to:

• Work with application settings.
• Deploy an application.

Module 12: Exploring Future Learning
This module provides an opportunity for students to explore some of the more advanced capabilities of C#, to practice the knowledge and skills that they acquired during the course, and discuss their questions as a group.

Lessons
• Exploring Additional Features of C#
After completing this module, students will be able to:

- Locate resources for additional C# features.
- Use those resources to further develop any of the projects that they started earlier in this course.
Updating Your SQL Server 2005 Skills to SQL Server 2008

Course 6158

About this Course

This three-day instructor-led course provides students with the knowledge and skills to upgrade their SQL Server 2005 skills to SQL Server 2008.

Audience Profile

- This course is intended for experienced SQL Server 2005 developers and database administrators who want to upgrade their skills to SQL Server 2008.

At Course Completion

- After completing this course, students will be able to:
  - Describe the new features of SQL Server 2008.
  - Manage SQL Server 2008.
  - Secure a SQL Server 2008 Database.
  - Develop databases with SQL Server 2008.
  - Create and maintain highly available SQL Server 2008 databases.
  - Create and use a SQL Server 2008 data warehouse.
  - Use SQL Server 2008 Reporting Services.
  - Use SQL Server 2008 Analysis Services.

Prerequisites

Before attending this course, students must have experience developing or administering SQL Server 2005 databases.

Course Outline

Module 1: Introduction to SQL Server 2008

Lessons

- The Evolution of SQL Server
- Preparing for SQL Server 2008

Lab: Exploring SQL Server Books Online

- Reviewing the SQL Server Books Online Tutorials
- Reviewing SQL Server Books Online

After completing this module, students will be able to:

- Describe the evolution of SQL Server.
- Prepare for SQL Server 2008.
Module 2: SQL Server 2008 Manageability Enhancements

Lessons
- Configuration Servers
- Policy-Based Management

Lab: Managing SQL Server 2008
- Creating a Configuration Server
- Creating and Applying a Policy

After completing this module, students will be able to:
- Create and use a configuration server.
- Create and use policies.

Module 3: SQL Server 2008 Performance Enhancements

Lessons
- Managing Workloads with Resource Governor
- Monitoring Performance with the Data Collector
- Managing Performance with Plan Freezing

Lab: Optimizing SQL Server 2008
- Using Resource Governor
- Using the Data Collector

After completing this module, students will be able to:
- Manage workloads with Resource Governor.
- Monitor performance with the Data Collector.
- Manage performance with Plan Freezing.

Module 4: SQL Server 2008 Security Enhancements

Lessons
- Encrypting Databases
- Auditing All Actions

Lab: Securing a SQL Server 2008 Database
- Using Transparent Data Encryption

After completing this module, students will be able to:
- Encrypt databases.
- Audit all actions.

Module 5: SQL Server 2008 Database Development Enhancements

Lessons
- Developer Tool Enhancements
- Data Type Enhancements
- Working with Spatial Data

Lab: Developing Databases with SQL Server 2008
- Using Date and Time Data Types
- Using Spatial Data

After completing this module, students will be able to:
- Describe the developer tool enhancements in SQL Server 2008.
- Use the data type enhancements in SQL Server 2008.
- Work with spatial data.

Module 6: SQL Server 2008 Availability Enhancements

Lessons
- Always On Technologies
- Transactional Peer-to-Peer Replication
### Course 6158:
Updating Your SQL Server 2005 Skills to SQL Server 2008

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<td>• Describe the SQL Server 2008 always on technologies.</td>
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<td>• Author reports.</td>
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<td>• Understand report processing and rendering.</td>
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### Module 7: SQL Server 2008 Data Warehousing Enhancements

#### Lessons
- ETL Enhancements
- Using Partitioned Tables
- Optimizing Data Storage

#### Lab: Data Warehousing with SQL Server 2008
- Using Change Data Capture
- Using the MERGE Statement
- Working with Partitioned Data

After completing this module, students will be able to:
- Describe the ETL enhancements in SQL Server 2008.
- Use partitioned tables.
- Optimize data storage.

### Module 8: SQL Server 2008 Reporting Services Enhancements

#### Lessons
- Reporting Services Architecture and Management
- Authoring Reports
- Report Processing and Rendering

#### Lab: Using SQL Server 2008 Reporting Services
- Creating a Report with Report Designer
- Managing Reporting Services

After completing this module, students will be able to:
- Describe the Reporting Services architecture and management.
- Author reports.
- Understand report processing and rendering.

### Module 9: SQL Server 2008 Analysis Services Enhancements

#### Lessons
- Multidimensional Analysis with SQL Server Analysis Services
- Data Mining with SQL Server Analysis Services

#### Lab: Using SQL Server 2008 Analysis Services
- Implementing Multidimensional Analysis
- Implementing Data Mining

After completing this module, students will be able to:
- Implement multidimensional analysis.
- Implement data mining.
About this Course

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2008 R2 database. The course focuses on teaching individuals how to use SQL Server 2008 R2 product features and tools related to maintaining a database.

Audience Profile

- The primary audience for this course is individuals who administer and maintain SQL Server databases. This course can also be helpful for individuals who develop applications that deliver content from SQL Server databases.

At Course Completion

- After completing this course, students will be able to:
  - Explain SQL Server 2008 R2 architecture, resources requirements and perform pre-checks of I/O subsystems
  - Plan, install and configure SQL Server 2008 R2
  - Backup and restore databases
  - Import and export wizards and explain how they relate to SSIS
  - Use BCP and BULK INSERT to import data
  - Manage security
  - Assign, configure fixed database roles and create and assign user defined database roles
  - Configure and assign permissions
  - Implement SQL Server 2008 R2 Audits
  - Manage SQL Server 2008 R2 Agent and Jobs
  - Configure database mails, alerts and notifications
  - Maintain databases
  - Configure SQL Profiler Traces and Use the Database Tuning Advisor
  - Monitor data by using Dynamic Management Views
  - Execute multi-server queries and configure a central management server
  - Deploy a data-tier-application
  - Troubleshoot common issues
Prerequisites

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.
- Completed Course 2778: Writing Queries Using Microsoft SQL Server 2008 Transact-SQL

Course Outline

Module 1: Introduction to SQL Server 2008 R2 and its Toolset

This module introduces you to the entire SQL Server platform and its major tools. This module also covers editions, versions, basics of network listeners, and concepts of services and service accounts.

Lessons

- Introduction to SQL Server Platform
- Working with SQL Server Tools
- Configuring SQL Server Services

Lab: Introduction to SQL Server 2008 R2 and its Toolset

- Verify SQL Server Component Installation
- Alter Service Accounts for New Instance
- Enable Named Pipes Protocol for Both Instances
- Create Aliases for AdventureWorks and Proseware
- Ensure SQL Browser is Disabled and Configure a Fixed TCP/IP Port
- Describe the SQL Server Platform
- Work with SQL Server Tools

Module 2: Preparing Systems for SQL Server 2008 R2

This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.

Lessons

- Overview of SQL Server 2008 R2 Architecture
- Planning Server Resource Requirements
- Pre-installation Testing for SQL Server 2008 R2

Lab: Preparing Systems for SQL Server 2008 R2

- Adjust memory configuration
- Perform Pre-installation Stress Testing
- Check Specific I/O Operations
- Describe the SQL Server architecture
- Plan for server resource requirements
- Conduct pre-installation stress testing
for SQL Server

**Module 3: Installing and Configuring SQL Server 2008 R2**

This module details installing and configuring SQL Server 2008 R2.

**Lessons**

- Preparing to Install SQL Server 2008 R2
- Installing SQL Server 2008 R2
- Upgrading and Automating Installation

**Lab: Installing and Configuring SQL Server 2008 R2**

- Review installation requirements
- Install the SQL Server instance
- Perform Post-installation Setup and Checks
- Configure Server Memory

- Prepare to install SQL Server
- Install SQL Server
- Upgrade and automate the installation of SQL Server

**Module 4: Working with Databases**

This module describes the system databases, the physical structure of databases and the most common configuration options related to them.

**Lessons**

- Overview of SQL Server Databases
- Working with Files and Filegroups
- Moving Database Files

**Lab: Working with Databases**

- Adjust tempdb configuration
- Create the RateTracking database
- Attach the OldProspects database

- Add multiple files to tempdb
- Describe the role and structure of SQL Server databases
- Work with files and filegroups
- Move database files within servers and between servers

**Module 5: Understanding SQL Server 2008 R2 Recovery Models**

This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server 2008 R2.

**Lessons**

- Backup Strategies
- Understanding SQL Server Transaction Logging
- Planning a SQL Server Backup Strategy

**Lab: Understanding SQL Server 2008 R2 Recovery Models**

- Plan a backup strategy
- Configure recovery models
- Review recovery models and strategy

- Describe the critical concepts surrounding backup strategies
- Explain the transaction logging capabilities within the SQL Server database engine
- Plan a SQL Server backup strategy

**Module 6: Backup of SQL Server 2008 R2 Databases**

This module describes SQL Server 2008 R2 Backup and the backup types.

**Lessons**

- Backing up Databases and Transaction
Logs
- Managing Database Backups
- Working with Backup Options

Lab : Backup of SQL Server 2008 R2 Databases
- Investigate backup compression
- Transaction log backup
- Differential backup
- Copy only backup
- Partial backup
- Back up databases and transaction logs
- Manage database backups
- Work with more advanced backup options

Module 7: Restoring SQL Server 2008 R2 Databases
This module describes the restoration of databases

Lessons
- Understanding the Restore Process
- Restoring Databases
- Working with Point-in-time Recovery
- Restoring System Databases and Individual Files

Lab : Restoring SQL Server 2008 R2 Databases
- Determine a restore strategy
- Restore the database
- Using STANDBY mode
- Understand the restore process
- Restore databases
- Work with Point-in-time Recovery
- Restore system databases and individual files

Module 8: Importing and Exporting Data
This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.

Lessons
- Transferring Data To/From SQL Server 2008 R2
- Importing & Exporting Table Data
- Inserting Data in Bulk
- Import the Excel spreadsheet
- Import the CSV file
- Create and test an extraction package
- Compare loading performance

Lab : Importing and Exporting Data
- Transfer data to and from SQL Server
- Import and export table data
- Insert data in bulk and optimize the bulk insert process

Module 9: Authenticating and Authorizing Users
This module covers SQL Server 2008 R2 security models, logins and users.

Lessons
- Authenticating Connections to SQL Server
- Authorizing Logins to Access Databases
- Authorization Across Servers
- Create Logins
- Correct an Application Login Issue
- Create Database Users
- Correct Access to Restored Database
- Describe how SQL Server authenticates connections
- Describe how logins are authorized to access databases
- Explain the requirements for authorization across servers

### Module 10: Assigning Server and Database Roles

This module covers fixed server roles, fixed database roles and user-defined database roles.

#### Lessons
- Working with Server Roles
- Working with Fixed Database Roles
- Creating User-defined Database Roles

#### Lab: Assigning Server and Database Roles
- Assign Server Roles
- Assign Fixed Database Roles
- Create and Assign User-defined Database Roles
- Check Role Assignments
- Work with server roles
- Work with fixed database roles
- Create user-defined database roles

### Module 11: Authorizing Users to Access Resources

This module covers permissions and the assignment of permissions.

#### Lessons
- Authorizing User Access to Objects
- Authorizing Users to Execute Code
- Configuring Permissions at the Schema Level

#### Lab: Authorizing Users to Access Resources
- Assign Schema-level Permissions
- Assign Object-level Permissions
- Test Permissions
- Authorize user access to objects
- Authorize users to execute code
- Configure permissions at the schema level

### Module 12: Auditing SQL Server Environments

This module covers SQL Server Audit.

#### Lessons
- Options for Auditing Data Access in SQL Server
- Implementing SQL Server Audit
- Managing SQL Server Audit

#### Lab: Auditing SQL Server Environments
- Determine audit configuration and create audit specifications
- Create database audit specifications
- Test audit functionality
- Describe the options for auditing data access in SQL Server
- Implement SQL Server Audit
- Manage SQL Server Audit

### Module 13: Automating SQL Server 2008 R2 Management

This module covers SQL Server Agent, jobs and job history.

#### Lessons
- Automating SQL Server Management
- Working with SQL Server Agent
- Managing SQL Server Agent Jobs
Lab : Automating SQL Server 2008 R2 Management
- Create a Data Extraction Job
- Schedule the Data Extraction Job
- Troubleshoot a Failing Job
- Automate SQL Server Management
- Work with SQL Server Agent
- Manage SQL Server Agent jobs

Module 14: Configuring Security for SQL Server Agent

This module covers SQL Server agent security, proxy accounts and credentials.

Lessons
- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

Lab : Configuring Security for SQL Server Agent
- Troubleshoot job execution failure
- Resolve the security issue
- Perform further troubleshooting
- Explain SQL Server Agent security
- Configure credentials
- Configure Proxy accounts

Module 15: Monitoring SQL Server 2008 R2 with Alerts and Notifications

This module covers the configuration of database mail, alerts and notifications.

Lessons
- Configuration of Database Mail
- Monitoring SQL Server Errors
- Configuring Operators, Alerts and Notifications

Lab : Monitoring SQL Agent Jobs with Alerts and Notifications
- Configure Database Mail
- Implement Notifications
- Implement Alerts
- Configure database mail
- Monitor SQL Server errors
- Configure operators, alerts and notifications

Module 16: Performing Ongoing Database Maintenance

This module covers database maintenance plans.

Lessons
- Ensuring Database Integrity
- Maintaining Indexes
- Automating Routine Database Maintenance

Lab : Ongoing Database Maintenance
- Check database integrity using DBCC CHECKDB
- Correct index fragmentation
- Create a database maintenance plan
- Investigate table lock performance
- Ensure database integrity
- Maintain indexes
- Automate routine database maintenance

Module 17: Tracing Access to SQL Server 2008 R2

This module covers SQL Profiler and SQL Trace stored procedures.
• Capturing Activity using SQL Server Profiler
• Improving Performance with the Database Engine Tuning Advisor
• Working with Tracing Options

Lab : Tracing Access to SQL Server 2008 R2

• Capture a trace using SQL Server Profiler
• Analyze a trace using Database Engine Tuning Advisor
• Configure SQL Trace
• Capture activity using SQL Server Profiler
• Improve performance with the Database Engine Tuning Advisor
• Work with tracing options

Module 18: Monitoring SQL Server 2008 R2
This module introduces DMVs and the configuration of data collection.

Lessons
• Monitoring Activity
• Capturing and Managing Performance Data
• Analyzing Collected Performance Data

Lab : Monitoring SQL Server 2008 R2

• Investigating DMVs
• Configure Management Data Warehouse
• Configure Instances for Data Collection
• Work with Data Collector Reports
• Monitor current activity
• Capture and manage performance data

• Analyze collected performance data

Module 19: Managing Multiple Servers
This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.

Lessons
• Working with Multiple Servers
• Virtualizing SQL Server
• Deploying and Upgrading Data-Tier Applications

Lab : Managing Multiple Servers

• Configure CMS and execute multi-server queries
• Deploy a data-tier application
• Register and extract a data-tier application
• Upgrade a data-tier application
• Work with multiple servers
• Describe options for virtualizing SQL Server
• Deploy and upgrade Data-Tier Applications

Module 20: Troubleshooting Common SQL Server 2008 R2 Administrative Issues
This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.

Lessons
• SQL Server Troubleshooting Methodology
• Resolving Service-related Issues
• Resolving Concurrency Issues
• Resolving Login and Connectivity Issues

Lab: Troubleshooting Common Issues

• Troubleshoot and resolve SQL Server administrative issues
• Explain SQL Server troubleshooting methodology
• Resolve service-related issues
• Resolve concurrency issues
• Resolve login and connectivity issues
Microsoft Course 6292A

Course Length: 3 days

Installing and Configuring Windows 7

Before attending this course, students must have:

- Experience installing PC hardware and devices.
- Basic understanding of TCP/IP and networking concepts.
- Basic Windows and Active Directory knowledge.
- The skills to map network file shares.
- Experience working from a command prompt.
- Basic knowledge of the fundamentals of applications. For example, how client computer applications communicate with the server.
- Basic understanding of security concepts such as authentication and authorization.
- An understanding of the fundamental principles of using printers.

Course Outline

Module 1: Installing, Upgrading, and Migrating to Windows 7. This module explains how to install, upgrade and migrate to Windows 7. It also describes the key features, editions, and hardware requirements of Windows 7.

Lessons

- Preparing to Install Windows 7
- Performing a Clean Installation of Windows 7
- Upgrading and Migrating to Windows 7
- Performing Image-based Installation of Windows 7
- Configuring Application Compatibility

Lab: Installing and Configuring Windows 7

- Migrating Settings by using Windows Easy Transfer
- Configuring a Reference Image of Windows 7
Configuring a Reference Image

After completing this module, students will be able to:

- Describe the key features, editions, and hardware requirements of Windows 7.
- Perform a clean installation of Windows 7
- Upgrade and Migrate to Windows 7 from an earlier version of Windows.
- Perform an image-based installation of Windows 7
- Resolve common application compatibility issues.

**Module 2: Configuring Disks and Device Drivers.** This module examines how to configure disks, partitions, volumes, and device drivers to enable Windows 7 to function as desired.

**Lessons**

- Partitioning Disks in Windows 7
- Managing Disk Volumes
- Maintaining Disks in Windows 7
- Installing and Configuring Device Drivers

**Lab: Configuring Disks and Device Drivers**

- Configuring Disks
- Configuring Disk Quotas (Optional)
- Updating a Device Driver

After completing this module, students will be able to:

- Configure disk partitions on a Windows 7 client computer
- Create and manage disk volumes
- Manage file system fragmentation and disk quotas
- Install and configure device drivers

**Module 3: Configuring File Access and Printers on Windows 7 Client Computers.** This module explains how to manage access to shared folders and printers on a computer running Windows 7. Specifically, it describes how to share and secure folders, configure folder compression, and how to install, configure, and administer printing.

**Lessons**

- Overview of Authentication and Authorization
- Managing File Access in Windows 7
Managing Shared Folders
Configuring File Compression
Managing Printing

**Lab : Configuring File Access and Printers on Windows 7 Client Computers**

Create and Configure a Public Shared Folder for all Users
Configuring Shared Access to Files for Specific Users
Creating and Sharing a Printer

After completing this module, students will be able to:

- Describe authentication and authorization
- Manage file access on a Windows 7 client computer
- Create and manage shared folders
- Configure file compression
- Install, configure, and administer printers

**Module 4: Configuring Network Connectivity.** This module explains both IPv4 and IPv6 network connectivity. It also describes how to implement automatic IP Address Allocation and troubleshoot network connectivity.

**Lessons**

- Configuring IPv4 Network Connectivity
- Configuring IPv6 Network Connectivity
- Implementing Automatic IP Address Allocation
- Overview of Name Resolution
- Troubleshooting Network Issues

**Lab : Configuring Network Connectivity**

- Configuring IPv4 Addressing
- Configuring IPv6 Addressing
- Troubleshooting Network Connectivity

After completing this module, students will be able to:

- Configure IPv4 network connectivity.
- Configure IPv6 network connectivity.
- Implement automatic IP address allocation.
Troubleshoot common network related issues by using the tools available in Windows 7.

**Module 5: Configuring Wireless Network Connections.** This module describes key wireless network technologies and how to configure wireless network components and the Windows 7 elements that are necessary to access wireless networks.

**Lessons**

- Overview of Wireless Networks
- Configuring a Wireless Network

**Lab : Configuring Wireless Network Connections**

- Determining the appropriate configuration for a wireless network
- Troubleshooting Wireless Connectivity

After completing this module, students will be able to:

- Describe the standards and technologies related to wireless network connections.
- Configure a wireless network connection.

**Module 6: Securing Windows 7 Desktops.** This module describes how to make a Windows 7 computer more secure while ensuring usability is not sacrificed in the process. Specifically, it describes Windows Firewall, User Account Control, Windows Defender, and Security in Internet Explorer 8.

**Lessons**

- Overview of Security Management in Windows 7
- Securing a Windows 7 Client Computer by Using Local Security Policy Settings
- Securing Data by Using EFS and BitLocker
- Configuring Application Restrictions
- Configuring User Account Control
- Configuring Windows Firewall
- Configuring Security Settings in Internet Explorer 8
- Configuring Windows Defender

**Lab : Configuring UAC, Local Security Policies, EFS, and AppLocker**

- Using Action Center
- Configuring Local Security Policies
- Encrypting Data
Configuring AppLocker

**Lab : Configuring Windows Firewall, Internet Explorer 8 Security Settings, and Windows Defender**

- Configuring Windows Firewall
- Configuring Internet Explorer 8 Security
- Configuring Windows Defender

After completing this module, students will be able to:

- Explain the security management features of Windows 7.
- Configure local security policy settings on a Windows 7 client computer.
- Secure data by using EFS and BitLocker.
- Configure application restrictions by using AppLocker.
- Configure user account control settings.
- Configure Windows Firewall on a Windows 7 client computer.
- Configure security-related settings in Internet Explorer to help protect a Windows 7 client computer that is connected to the Internet.
- Configure Windows Defender to help protect a Windows 7 client computer against malicious software.

**Module 7: Optimizing and Maintaining Windows 7 Client Computers.** This module describes how to use the monitoring and configuration tools to obtain information about Windows 7 performance and how to troubleshoot performance and reliability problems.

**Lessons**

- Maintaining Performance by Using the Windows 7 Performance Tools
- Maintaining Reliability by Using the Windows 7 Diagnostic Tools
- Backing Up and Restoring Data by Using Windows Backup
- Restoring a Windows 7 System by Using System Restore Points
- Configuring Windows Update

**Lab : Optimizing and Maintaining Windows 7 Client Computers**

- Monitoring System Performance
- Backing Up and Restoring Data
- Configuring System Restore Points
- Configuring Windows Update
After completing this module, students will be able to:

- Maintain the performance of a Windows 7 client computer by using performance management tools.
- Maintain reliability of a Windows 7 client computer by using the diagnostic tools.
- Back up and restore data on a Windows 7 client computer by using Windows Backup.
- Restore a Windows 7 system by using system restore points.
- Configure Windows Update on a Windows 7 client computer.

Module 8: Configuring Mobile Computing and Remote Access in Windows 7. This module explains how to configure mobile devices and remote access. It also discusses DirectAccess and BranchCache which are new for Windows 7.

Lessons

- Configuring Mobile Computer and Device Settings
- Configuring Remote Desktop and Remote Assistance for Remote Access
- Configuring DirectAccess for Remote Access
- Configuring BranchCache for Remote Access

Lab: Configuring Mobile Computing and Remote Access in Windows 7

- Creating a Sync Partnership
- Configuring Power Options
- Enabling Remote Desktop
- Enabling BranchCache

After completing this module, students will be able to:

- Configure mobile computer and device settings on a Windows 7 client computer.
- Configure Remote Desktop and Remote Assistance on a Windows 7 client computer.
- Configure DirectAccess on a Windows 7 client computer for remote access.
- Configure BranchCache on a branch office Windows 7 client computer.
Core Solutions of MS SharePoint Server 2013
Course#: MS20331

Length: 5 Days
Audience: IT Professionals
Level: 300
Technology: MS SharePoint Server 201
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course

This course will provide you with the knowledge and skills to configure and manage a MS SharePoint Server 2013 environment. This course will teach you how to configure SharePoint Server 2013, as well as provide guidelines, best practices, and considerations that will help you optimize your SharePoint server deployment. This is the first in a sequence of two courses for IT Professional and will align with the first exam in the SharePoint Server 2013 IT Pro certification.

Audience Profile

The course is targeted at experienced IT Professionals interested in learning how to install, configure, deploy and manage SharePoint Server 2013 installations in either the data center or the cloud. Students typically have more than four years of hands-on experience planning and maintaining SharePoint and other core technologies upon which SharePoint depends, including Windows Server 2008 R2 or later, Internet Information Services (IIS), SQL Server 2008 R2 or later, Active Directory, and networking infrastructure services.

The minimally qualified candidate typically:

- Is an IT professional who plans, implements, and maintains a multi-server deployment of SharePoint Server 2013.
- Has a working knowledge of, and preferably hands-on experience, with SharePoint Online.
- Has broad familiarity with SharePoint workloads.
- Have experience with business continuity management, including data backup, restoration, and high availability.
- Has experience with authentication and security technologies
- Has experience with Windows PowerShell.
- Hands-on experience or job experience is considered a solutions-based role where the candidate works within the solutions space covered by SharePoint, working on multiple solutions in the SharePoint space that includes document management, content management, and search.

The secondary audience for this course are Business Application Administrators (BAAs) who are engaged in the administering line-of-business (LOB) projects in conjunction with internal business customers would benefit from an understanding of how to manage SharePoint Server 2013. Administrators who are entirely new to SharePoint will gain some benefit from the course, but it is recommended that they familiarize themselves with the basic concepts of the SharePoint platform before attending.

At Course Completion

After completing this course, students will be able to:

- Describe the key features of SharePoint 2013
- Design an information architecture
- Design logical and physical architectures
- Install and configure SharePoint Server 2013
- Create web applications and site collections
- Plan and configure service applications
- Manage users and permissions
- Configure authentication for SharePoint 2013
- Secure a SharePoint 2013 deployment
- Manage taxonomy
- Configure user profiles
- Configure enterprise search
- Monitor and maintain a SharePoint 2013 environment

Prerequisites

An ideal candidate will have at least one year of experience with deploying and administering multiple SharePoint 2010 farms across a large enterprise. Because many customers skipped upgrading from SharePoint 2007, a candidate can also have at least two years of experience with SharePoint 2007 and knowledge of the differences between 2007 and 2010, particularly the Service Application model. A candidate can demonstrate the following skills:

- Deploying and managing applications natively, virtually and in the cloud.
- Administering Internet Information Services (IIS).
• Configuring Active Directory for use in authentication, authorization and as a user store.
• Managing an application remotely using Windows PowerShell 2.0.
• Connecting applications to Microsoft SQL Server.
• Implementing Claims-based Security

Course Outline

Module 1: Introducing SharePoint Server 2013
Microsoft SharePoint Server 2013 is a document storage and collaboration platform that offers many benefits to organizations. SharePoint deployments may take many different forms in scope, where a deployment may be focused on only delivering one feature, such as enterprise search, or many features, such as document management, business intelligence, web content management, and workflows. Deployments can also differ greatly in size, with small deployments of a single server up to large deployments with farms of 15 or more servers.

In this module, you will learn about the core features of SharePoint 2013, the new features in this version, and what has been removed. You will also learn about the basic structural elements of a farm deployment and how they fit together. Finally you will learn about the different deployment options available to SharePoint 2013.

Lessons
• Key Components of a SharePoint Deployment
• New Features in SharePoint 2013
• SharePoint 2013 Deployment Options

Lab: Designing a Physical Architecture
After completing this module, students will be able to:
• Explain how understanding business requirements drives the design of an organizational IA.
• Describe the key components available in SharePoint 2013 to deploy an IA.
• Plan for discoverability as part of an IA deployment.

Module 3: Designing a Logical Architecture
This module reviews the logical constructs of Microsoft SharePoint Server 2013 and SharePoint Online. It discusses the importance of creating a logical architecture design based on business requirements before you implement a solution. The module covers conceptual content, defining a logical architecture, and the components of Microsoft SharePoint Server 2013 that you must map to business specifications.

Lessons
• Overview of SharePoint 2013 Logical Architecture
• Documenting Your Logical Architecture

Lab: Designing A Logical Architecture
• Plan a Logical Architecture
• Produce a Logical Architecture Diagram

Module 4: Designing a Physical Architecture
When you design a Microsoft SharePoint Server 2013 deployment, you must carefully consider the hardware and farm topology requirements. Your choices of server hardware and the number of servers that you specify for the farm can have a significant impact on how the farm meets user requirements, how users perceive the SharePoint solution, and how long before the farm requires additional hardware.

This module describes the factors that you should consider when you design the physical architecture of a SharePoint 2013 deployment. The physical architecture refers to the server design, farm topology, and supporting elements—such as network infrastructure—for your deployment. This physical architecture underpins the operations of your SharePoint 2013 environment, so it is essential that your physical design fully meets the operational requirements.

Lessons
• Designing Physical Components for SharePoint deployments
• Designing Supporting Components for SharePoint Deployments
• SharePoint Farm Topologies
• Mapping a Logical Architecture Design to a Physical Architecture Design

Lab: Designing a Physical Architecture
• Designing a physical architecture
• Develop a physical architecture design diagram
Module 5: Installing and Configuring SharePoint Server 2013

After you design and plan your logical and physical architectures for a Microsoft SharePoint Server 2013 deployment, the next installation steps are to implement the deployment design and specify configuration settings for the deployment.

In this module, you will learn about installing SharePoint 2013 in various topologies. You will learn how to configure farm settings, and how to script the installation and configuration of SharePoint 2013.

Lessons
- Installing SharePoint Server 2013
- Scripting Installation and Configuration
- Configuring SharePoint Server 2013 Farm Settings

Lab: Deploying and Configuring SharePoint Server 2013 – Part One
- Provisioning a SharePoint 2013 Server Farm

Lab: Configuring SharePoint Server 2031 Farm Settings
- Configuring SharePoint Server 2013 Farm Settings
- Configuring Outgoing Email
- Configuring Integration with Office Web Apps Server 2013

After completing this module, students will be able to:
- Install SharePoint 2013
- Configure SharePoint 2013 farm settings.
- Script the installation and configuration of SharePoint 2013.

Module 6: Creating Web Applications and Site collections

After installing your Microsoft SharePoint Server 2013 farm, you are ready to begin deploying sites and content, such as an organizational intranet site.

In this module, you will learn about the key concepts and skills related to the logical architecture of SharePoint including web applications, site collections, sites, and content databases. Specifically, you will learn how to create and configure web applications and to create and configure site collections.

Lessons
- Creating Web Applications
- Configuring Web Applications
- Creating and Configuring Site Collections

Lab: Creating and Configuring Web Applications
- Creating a Web Application
- Configuring a Web Application

Lab: Creating and Configuring Site Collections
- Creating Site Collections
- Creating Site Collections in New Content Databases
- Creating a Warm-up Script

Module 7: Planning and Configuring Service Applications

Service applications were introduced in Microsoft SharePoint Server 2010, replacing the Shared Service Provider architecture of Microsoft Office SharePoint Server 2007. Service applications provide a flexible design for delivering services, such as Managed Metadata or Performance Point, to users who need them. Microsoft SharePoint Server 2013 includes more than 20 services, some of which are new to this version, whereas others are enhanced. In planning and configuring service applications, it is important that you understand the dependencies, resource usage, and business requirements for each.

This module reviews the basic service application architecture, the essentials of planning your service application deployment, and the configuration of your service applications. This module does not discuss sharing, or federation, of service applications. This is covered in more detail in course 20332B: Advanced Solutions of Microsoft SharePoint Server 2013

Lessons
- Introduction to Service Application Architecture
- Creating and Configuring Service Applications

Lab: Planning and Configuring Service Applications
- Provisioning a Managed Metadata Service application with Central Administration
- Provisioning a Managed Metadata Service Application with Windows PowerShell
- Configuring Service Applications for Document Conversions
- Configuring Service Application Proxy Groups

After completing this module, students will be able to:
- Explain the key components and topologies for SharePoint Server 2013 service application architecture
- Describe how to provision and manage SharePoint 2013 service applications.

Module 8: Managing Users and Permission

Many organizations need to store sensitive or confidential information. Microsoft SharePoint Server 2013 includes a complete set of security features, which you can use to help ensure that users with the appropriate rights and permissions can access the information they need, can modify the data they are responsible for, but that they cannot view or modify confidential information, or information that is not intended for them. The SharePoint 2013 security model is highly flexible and adaptable to your organization’s needs.

In this module, you will learn about the various authorization and security features available in SharePoint 2013 to help you maintain a secure SharePoint environment. Specifically, you will be learning about authorization and permissions in SharePoint 2013, and how to manage access to content in SharePoint 2013.

Lessons
- Authorization in SharePoint 2013
- Managing Access to Content

Lab: Managing Users and Groups
- Creating a Web Application Policy
Lesson: Lessons the farm level.

2013 farm deployment and how to configure several security settings at

In this module, you will learn how to secure and harden your SharePoint

several security features and tools out

LOB) applications and Microsoft Active Directory; therefore, it has a large

collaboration and social features, as well as being many other things. In

Microsoft SharePoint Server 2013 is not just a

Module 9: Configuring Authentication for SharePoint 2013

Authentication is the process by which you establish the identity of users and computers. Authorization controls access to resources by assigning permissions to users and computers. To provide authorization to consumers of Microsoft SharePoint content and services, whether they are end users, server platforms, or SharePoint apps, you first need to verify that they are who they claim to be. Together, authentication and authorization play a central role in the security of a SharePoint 2013 deployment by ensuring that consumers can only access resources to which you have explicitly granted them access.

In this module, you will learn about the authentication infrastructure in SharePoint 2013. You will learn how to configure SharePoint to work with a variety of authentication providers, and you will learn how to configure authenticated connections between SharePoint and other server platforms.

Lessons

• Overview of Authentication
• Configuring Federated Authentication
• Configuring Server-to-Server Authentication

Lab: Configuring SharePoint 2013 to Use Federated Identities

• Configuring AD FS to Make the Web Application a Relying Party
• Configuring SharePoint to Trust AD FS as an Identity Provider
• Configuring the Web Application to Use the AD FS Identity Provider

After completing this module, students will be able to:

• Explain the authentication infrastructure of SharePoint 2013
• Configure claims providers and identity federation for SharePoint 2013
• Configure Server-to-server authentication for SharePoint 2013

Module 10: Securing a SharePoint 2013 Deployment

Microsoft SharePoint Server 2013 is not just a group of websites—it is also a site-provisioning engine for intranets, extranets, and Internet sites, a collection of databases, an application platform, and a platform for collaboration and social features, as well as being many other things. In addition to it touching your network, it also touches your line-of-business (LOB) applications and Microsoft Active Directory; therefore, it has a large attack surface to consider and protect. SharePoint 2013 is supplied with several security features and tools out-of-the-box to help you secure it.

In this module, you will learn how to secure and harden your SharePoint 2013 farm deployment and how to configure several security settings at the farm level.

Lessons

• Securing the Platform

Lab: Hardening a SharePoint 2013 Server Farm

• Configuring SharePoint and SQL Server to Communicate over non-standard ports
• Configuring firewalls for SharePoint Server Farms

Module 11: Managing Taxonomy

In order to organize information and make that information easier to find and work with, you can label or categorize information. With files and items in Microsoft SharePoint, you can apply metadata, which could be a category, a classification, or a tag, in order to organize your content and make it easier to work with.

In most organizations, the most effective way to implement metadata is through a defined taxonomy that you have standardized through stakeholder input. This enables users to select metadata terms from a predefined list, which provides standard results.

Microsoft SharePoint Server 2013 can further enhance the application of metadata by using content types. Organizations can use content types to standardize specific types of files, documents, or list items and include metadata requirements, document templates, retention settings, and workflow directly.

Lessons

• Managing Content Types
• Understanding Term Stores and Term Sets
• Managing Term Stores and Term Sets

Lab: Configuring Content Type Propagation

• Creating Content Types for Propagation
• Publishing Content Types Across Site Collections

Lab: Configuring and Using Managed Metadata Term Sets

• Configuring the Managed Metadata Service
• Creating Term sets and Terms
• Consuming Term sets

After completing this module, students will be able to:

• Describe the function of content types and explain how to apply them to business requirements
• Describe the function of managed metadata in SharePoint 2013
• Configure the Managed Metadata Service and supporting components

Module 12: Configuring User Profiles

Social computing environments enable organizations to quickly identify colleagues, team members, and others with similar roles or requirements in an organization. Social features in Microsoft SharePoint Server 2013 enable users to quickly gain updates and insight into how other members of the organization are working and what information or processes people are developing, along with the progress being achieved.
The SharePoint 2013 social platform is based around the capabilities provided by the user profile service application, supported by other services, such as the Managed Metadata Service and the Search service. The User Profile Service provides configuration and control over importing profile data, creating My Sites, managing audiences, and users can utilize these features.

Lessons
- Configuring the user profile service application
- Managing User profiles and audiences

Lab: Configuring User Profiles
- LESSON ITEMS - STYLE =LIST PARAGRAPH LVL1

Lab: Configuring Enterprise Search

Search has been a cornerstone of Microsoft SharePoint Products and Technologies since SharePoint Portal Server 2003. Since those early days, the architecture of the search service has evolved through the Shared Service Provider architecture to the service application architecture of SharePoint Server 2010. It has also grown with the addition of FAST technologies. SharePoint Server 2013 continues this growth by re-architecting the service and integrating many of the components that were intrinsic to FAST Search to deliver a more robust and richer experience for IT staff and users.

In this module, you will learn about the new architecture of the Search service, how to configure the key components of search, and how to manage search functionality in your organization.

Lessons
- Understanding the search service architecture
- Configuring Enterprise Search
- Managing Enterprise Search

Lab: Configuring Enterprise Search
- Configuring the search Service Application
- Configuring a File Share Content Source
- Configuring a Local SharePoint Content Source
- Creating a Search Center

Lab: Configuring the Search Experience
- Optimizing Search Results
- Customizing the Search Experience

After completing this module, students will be able to:
- Describe the core architecture of the Search service and its supported topologies
- Explain the steps required to configure the Search service in an enterprise environment.
- Describe how to manage and maintain a well-performing Search environment.

Module 14: Monitoring and Maintaining a SharePoint 2013 Environment

Careful planning and configuration alone will not guarantee an effective Microsoft SharePoint Server 2013 deployment. To keep your SharePoint 2013 deployment performing well, you need to plan and conduct ongoing monitoring, maintenance, optimization, and troubleshooting.

In this module, you will learn how to plan and configure monitoring in a SharePoint 2013 server farm, and how to tune and optimize the performance of your farm on an ongoing basis. You will also learn how to use a range of tools and techniques to troubleshoot unexpected problems in your SharePoint 2013 deployments.

Lessons
- Monitoring a SharePoint 2013 Environment
- Tuning and Optimizing a SharePoint Environment
- Planning and Configuring Caching
- Troubleshooting a SharePoint 2013 Environment

Lab: Monitoring a SharePoint 2013 Deployment
- Configuring Usage and Health Data Collection
- Configuring SharePoint Diagnostic Logging
- Configuring Health Analyzer Rules
- Reviewing Usage and Health Data

Lab: Investigating Page Load Times
- Investigating Page Load Times
- Analyzing SharePoint Page Performance

After completing this module, students will be able to:
- Develop and implement a monitoring plan for a SharePoint 2013 environment
- Tune and optimize a SharePoint 2013 server farm on an ongoing basis
- Plan and configure caching to improve the performance of a SharePoint 2013 deployment
- Troubleshoot errors and other issues in a SharePoint 2013 deployment
Advanced Solutions of Microsoft SharePoint Server 2013
Course#: MS 20332

Length: 5 Days
Audience: IT Professionals
Level: 300
Technology: MS SharePoint Server 201
Type: Hands-On Course
Delivery Method: Instructor-led Classroom

About this Course

This five-day course examines how to plan, configure, and manage a Microsoft SharePoint Server 2013 environment. Special areas of focus include implementing high availability, disaster recovery, service application architecture, Business Connectivity Services, social computing features, productivity and collaboration platforms and features, business intelligence solutions, enterprise content management, web content management infrastructure, solutions, and apps. The course also examines how to optimize the Search experience, how to develop and implement a governance plan, and how to perform an upgrade or migration to SharePoint Server 2013.

Audience Profile

The course track is targeted at experienced IT Professionals interested in learning how to install, configure, deploy and manage SharePoint Server 2013 installations in either the data center or cloud. In addition, Business Application Administrators (BAAs) who are engaged in the administering line-of-business (LOB) projects in conjunction with internal business customers would benefit from understanding of managing SharePoint Server 2013.

The training addresses three audiences:
• Existing SharePoint 2010 customers and partners who need to understand the major changes in SharePoint 2013. In addition there have been other improvements in tools and methodologies.
• Customer who are new to SharePoint. SharePoint market size is growing significantly and is expected to continue to grow, so there are many new customers with no previous experience.
• Customers running a previous version of SharePoint (SharePoint 2003 and SharePoint 2007) which did not upgrade to SharePoint 2010, so are not familiar with the architecture of SharePoint 2010 or SharePoint Server 2013.

At Course Completion

After completing this course, students will be able to:

• Describe the core features of SharePoint 2013
• Plan and design a SharePoint 2013 environment to meet requirements for high availability and disaster recovery
• Plan and implement a service application architecture for a SharePoint 2013 deployment
• Configure and manage Business Connectivity Services features in a SharePoint 2013 deployment
• Plan and configure social computing features
• Plan and configure productivity and collaboration platforms and features
• Plan and configure Business Intelligence solutions
• Optimize the search experience for an enterprise environment
• Plan and configure enterprise content management in a SharePoint 2013 deployment
• Plan and configure a web content management infrastructure to meet business requirements
• Manage solutions in a SharePoint 2013 deployment
• Configure and manage apps in a SharePoint Server 2013 environment
• Develop and implement a governance plan for SharePoint Server 2013
• Perform an upgrade or migration to SharePoint Server 2013

Prerequisites

Before attending this course, students must have:
• Completed Course 20331: Core Solutions of Microsoft SharePoint Server 2013, successful completion of Exam 70-331: Core Solutions of Microsoft SharePoint 2013, or equivalent skills.
• At least one year’s experience of mapping business requirements to logical and physical technical design.
• Working knowledge of network design, including network security.
• Experience managing software in a Windows 2008 R2 enterprise server or Windows Server 2012 environment.
• Deployed and managed applications natively, virtually, and in the cloud.
Module 1: Understanding the SharePoint Server 2013 Architecture
This module introduces the architectural features that underpin Microsoft SharePoint Server 2013, both for on-premises and online deployments. This includes an examination of the features that are new in this version, as well as those that have been removed. This module reviews the basic structural elements of a farm deployment, and the different deployment options that are available in SharePoint 2013.

Lessons
- Core Components of the SharePoint 2013 Architecture
- New Features in SharePoint Server 2013
- SharePoint Server 2013 and SharePoint Online Editions

Lab: Reviewing Core SharePoint Concepts
- Configuring SharePoint Server 2013 Farms
- Creating and Configuring Site Collections and Sites
After completing this module, students will be able to:
- Describe the architectural features of SharePoint Server 2013
- Identify new and deprecated features in SharePoint 2013
- Describe the editions for SharePoint Server 2013 on-premise and SharePoint Online

Module 2: Designing Business Continuity Management Strategies
This module examines high availability and disaster recovery in SharePoint 2013. When designing high availability and disaster recovery strategies for a SharePoint farm, it is important to understand the different approaches required by each logical tier in the farm. High availability for the database tier requires understanding of how SQL Server provides high availability and the associated requirements. High availability for the application tier can be straightforward for some service applications, while other applications, such as Search, require additional planning and configuration for high availability. The web front end tier will also require additional planning and configuration for high availability, and architects should consider the new SharePoint 2013 request management feature. SharePoint farm disaster recovery has always required considerable planning and understanding of the necessary components and backup tools available. In this regard SharePoint 2013 is no different, and farm administrators should create a disaster recovery plan that states how content and configurations are backed up, how data can be restored, and what backup schedules are required.

Lessons
- Designing Database Topologies for High Availability and Disaster Recovery
- Designing SharePoint Infrastructure for High Availability
- Planning for Disaster Recovery

Lab: Planning and Performing Backups and Restores
- Create a Backup and Restore Plan
- Test the backup and restore process
After completing this module, students will be able to:
- Select an appropriate database server configuration to meet availability requirements
- Design a physical architecture and infrastructure to meet availability requirements
- Develop and implement a backup and restore strategy

Module 3: Planning and Implementing a Service Application Architecture
Service applications were introduced in SharePoint 2010, replacing the Shared Service Provider architecture of Microsoft Office SharePoint Server 2007. Service applications provide a flexible design for delivering services, such as managed metadata or PerformancePoint, to users who need them. There are several deployment topologies available to you when you plan your service application implementation. These range from a simple, single-farm, single-instance service application model to more complex, cross-farm, multiple-instance designs. What remains most important is that you create a design that matches the needs of your organization's users in terms of performance, functionality, and security.

This module reviews the service application architecture, how to map business requirements to design, and the options for enterprise scale, federated service application architectures.

Lessons
- Planning Service Applications
- Designing and configuring a Service Application Topology
- Configuring Service Application Federation

Lab: Planning a Service Application Topology
- Planning a Service Application Topology

Lab: Federating Service Applications between SharePoint Server Farms
- Creating a Service Application Instance
- Establishing Trust Relationships between SharePoint Farms
- Publishing and Consuming Service Applications
After completing this module, students will be able to:
- Explain the service application architecture
- Describe the fundamental options of service application design
- Describe how to configure a federated service application deployment

Module 4: Configuring and Managing Business Connectivity Services
Most organizations store information in a variety of disparate systems. In many cases, these organizations want to be able to view and interact with information from these disparate systems from a single interface. This reduces the need for information workers to constantly switch between systems and creates opportunities for power users or analysts to aggregate data from multiple sources.
In SharePoint 2013, Business Connectivity Services (BCS) is a collection of technologies that enable you to query, view, and interact with data from external systems. In this module, you will learn how to plan and configure various components of BCS.

**Lessons**
- Planning and Configuring Business Connectivity Services
- Configuring the Secure Store Service
- Managing Business Data Connectivity Models

**Lab: Configuring BCS and the Secure Store Service**
- Configuring the Business Data Connectivity Service Application
- Configuring the Secure Store Service

**Lab: Managing Business Data Connectivity Models**
- Configuring a Secure Store Service Target Application
- Importing and Configuring BDC Models

After completing this module, students will be able to:
- Plan and configure the Business Data Connectivity Service application
- Plan and configure the Secure Store Service application
- Manage Business Data Connectivity models

**Module 5: Connecting People**
Talking about connecting people in Microsoft SharePoint Server 2013 really means talking about taking people out of their isolated workspaces and giving them the ability and tools to collaborate with other people in the organization such as their work colleagues, peers, and executives. It is about finding people with expertise, and identifying shared interests and about creating networks of people that share common goals.

In this module, you will learn about the concepts and ways of connecting people in SharePoint 2013. You will examine user profiles and user profile synchronization, social interaction features and capabilities, and communities and community sites in SharePoint 2013.

**Lessons**
- Managing User Profiles
- Enabling Social Interaction
- Building Communities

**Lab: Configuring Profile Synchronization and My Sites**
- Configuring Profile Synchronization
- Configuring My Sites

**Lab: Configuring Community Sites**
- Creating a Community Site Infrastructure
- Configuring Community Site Participation

After completing this module, students will be able to:
- Understand and manage user profiles and user profile synchronization in SharePoint 2013
- Enable social interaction in SharePoint 2013
- Understand and build communities and community sites in SharePoint 2013

**Module 6: Enabling Productivity and Collaboration**
This module examines how SharePoint 2013 extends the ability of users to work together, share documents, and communicate with each other. It covers the creation of communities and community sites, using collaboration features, and the provision of flexible tools, with which users can develop their own solutions to business problems.

**Lessons**
- Aggregating Tasks
- Planning and Configuring Collaboration Features
- Planning and Configuring composites

**Lab: Configuring Project Sites**
- Creating Project Sites
- Configuring Project Sites
- Engaging Project Teams

**Lab: Configuring Workflow**
- Configure Windows Azure Workflow and SharePoint Workflow Services
- Creating and Testing a Workflow

After completing this module, students will be able to:
- Explain how the integration options for Exchange 2013 and Project Server 2013 improve task aggregation
- Describe how to plan and configure SharePoint collaborative and co-authoring options
- Describe how to plan and use workflows in SharePoint 2013

**Module 7: Planning and Configuring Business Intelligence**
Business Intelligence (BI) continues to be an important area for large enterprise organizations. The key to successful BI is the ability to integrate the components that deliver the right information, to the right people, at the right time. Microsoft SharePoint Server 2013 Enterprise Edition provides a range of integrated solutions that enable both users and administrators across an organization to develop BI solutions to fit their business requirements. These BI tools extend beyond SharePoint to provide consistent information management from personal data analysis environments, which use Microsoft Excel, through to departmental or organizational data repositories, which use SQL Server Reporting Services (SSRS) and SQL Server Analysis Services (SSAS).

In this module you will see how SharePoint 2013 can deliver BI solutions for your business.

**Lessons**
- Planning for Business Intelligence
- Planning, Deploying and Managing Business intelligence Services
- Planning and Configuring Advanced Analysis Tools

**Lab: Configuring Excel Services**
- Provisioning Excel Services
- Configuring External Data Access
- Configuring Data Connections

**Lab: Configuring PowerPivot and Power View for SharePoint**
- Configuring PowerPivot for SharePoint
- Configuring Power View for SharePoint

After completing this module, students will be able to:
- Explain the SharePoint BI architecture, its components, and how to identify BI opportunities in your organization
to work collaboratively and increase productivity through seamless
Module 8: Planning and Configuring Enterprise Search

The Search service remains a cornerstone of the SharePoint platform's success. In Microsoft SharePoint Server 2013 there have been major changes to the components that make up the service, to increase performance and configurability.

In this module, you will examine the configuration options in SharePoint Search that enable you to provide greater search result effectiveness by fine-tuning the service in various ways. The introduction of new functionality, such as result types and the increased move towards search-driven navigation mean that the role of the Search administrator has become even more important for business success. Search now enables you to delegate more of this management to site collection administrator and site owner levels, improving Search flexibility without increasing the administrative burden on a few Search service application administrators.

This module also examines Search analytics and reporting. To help you in your management of a Search environment, SharePoint 2013 now incorporates Search analytics and reporting into the Search service, rather than in a separate service application, as was the case in SharePoint Server 2010. The reports available will help you to monitor the service and optimize its configuration.

Lessons
- Configuring Search for an Enterprise Environment
- Configuring the Search Experience
- Optimizing Your Search

Lab: Planning an Enterprise Search Deployment
- Planning a Search Solution

Lab: Managing Search Relevance in SharePoint 2013
- Configuring a Thesaurus
- Configuring Entity Extractors and Refiners
- Configuring Query Spelling Correction
- Configuring Company Name Extraction

After completing this module, students will be able to:
- Describe the Search Service architecture and key areas of configuration
- Explain how to configure the Search service to improve the end-user experience
- Describe how to use analytics reports to optimize your Search environment

Module 9: Planning and Configuring Enterprise Content Management

This module examines Enterprise Content Management (ECM), which is a set of technologies and features that administrators use to provide some control over sites and content. This could include control over how information is stored, how long information is kept, how information is visible to users while in use, and how information growth is kept under control.

Planning support for your ECM requirements requires a clear understanding of content requirements and how that content supports the organization. This means that, as a best practice, many different organizational roles should have input into the ECM strategy and supporting features.

Lessons
- Planning Content Management
- Planning and Configuring eDiscovery
- Planning Records Management

Lab: Configuring eDiscovery in SharePoint Server 2013
- Creating and Configuring an eDiscovery Center
- Discovery and Preserving Content
- Querying and Exporting Content

Lab: Configuring Records Management in SharePoint Server 2013
- Configuring In-Place Records Management

After completing this module, students will be able to:
- Plan how to manage content and documents
- Plan and configure eDiscovery
- Plan records management and compliance

Module 10: Planning and Configuring Web Content Management

The web content management capabilities in Microsoft SharePoint Server 2013 can help an organization to communicate and integrate more effectively with employees, partners, and customers. SharePoint Server 2013 provides easy-to-use functionality to create, approve, and publish web content. This enables you to get information out quickly to intranet, extranet, and Internet sites and give your content a consistent look and feel. You can use these web content management capabilities to create, publish, manage, and control a large and dynamic collection of content.

As part of Enterprise Content Management (ECM) in SharePoint Server 2013, web content management can help to streamline your process for creating and publishing web sites.

Lessons
- Planning and Implementing a Web Content Management Infrastructure
- Configuring Managed Navigation and Catalog Sites
- Supporting Multiple Languages and Locales
- Enabling Design and Customization
- Supporting Mobile Users

Lab: Configuring Managed Navigation and Catalog Sites
- Configuring Product Catalog Sites
- Configuring Cross-Site Publishing
- Configuring Publishing Sites

Lab: Configuring Device Channels
- Configuring Device Channels

After completing this module, students will be able to:
- Plan and Configure a Web Content Management infrastructure to meet business requirements
- Configure managed navigation and product catalog sites
- Plan and configure support for multilingual sites
- Manage design and customization for publishing sites
- Plan and configure support for mobile users
Module 11: Managing Solutions in SharePoint Server 2013

As a SharePoint administrator, it is important to understand the features that are available in Microsoft SharePoint Server 2013. However, there are often specific functional requirements that may be part of SharePoint’s feature set but are not included in certain site templates. There may also be sites that require repeatable customization of lists or libraries, or custom code deployments that are necessary to add capabilities that are not available out-of-the-box. Developers use features and solutions to add and control these functionality requirements. Administrators, on the other hand, must understand how features and solutions are deployed and managed in order to meet user needs in a SharePoint farm.

Lessons
- Understanding the SharePoint Solution Architecture
- Managing Sandbox Solutions

Lab: Managing Solutions
- Configuring Sandbox Solution Management at the Farm Level
- Configuring Sandbox Solution Management at the Site Collection Level
- Deploying Farm Solutions

After completing this module, students will be able to:
- Describe and manage SharePoint features and solutions
- Managed sandboxed solutions in a SharePoint 2013 deployment

Module 12: Managing Apps for SharePoint Server 2013

SharePoint apps are new to Microsoft SharePoint Server 2013 and provide an additional capability to provide application functionality within the context of SharePoint. SharePoint apps supplement the capabilities of farm solutions and sandbox solutions, while providing a user experience that offers a measure of self-service customization capabilities without putting the stability or security of the farm at risk.

Lessons
- Understanding the SharePoint App Architecture
- Provisioning and Managing Apps and App Catalogs

Lab: Configuring and Managing SharePoint Apps
- Configuring a SharePoint Farm to Support Apps
- Creating and configuring a Corporate app Catalog
- Deploying and Monitoring apps

After completing this module, students will be able to:
- Describe SharePoint apps and the supporting SharePoint Infrastructure
- Provision and configure SharePoint apps and app catalogs
- Manage how apps are used within a SharePoint 2013 deployment

Module 13: Deploying a Governance Plan

Governance as it relates to SharePoint can be described as a way of controlling a SharePoint environment through the application of people, policies, and processes. Governance is necessary for all IT systems as a whole, and in particular for SharePoint deployments, which often introduce significant change in business processes, available functionality, and day-to-day working practices.

It is important to understand that governance must reflect the needs of the organization and how it should best use SharePoint. Therefore, the IT department cannot be the only body governing SharePoint; input must come from corporate sponsorship across the organization. The IT department must still act as the technical authority for SharePoint; however, this is just a single part of how SharePoint governance must be brought together from different parts of the organization.

Lessons
- Introduction to Governance Planning
- Key Elements of a Governance Plan
- Planning for Governance in SharePoint 2013
- Implementing Governance in SharePoint 2013

Lab: Developing a Plan for Governance
- Creating a Governance Plan

Lab: Managing Site Creation and Deletion
- Creating and Publishing site Policies
- Enabling and Managing Self-Service Site Creation

After completing this module, students will be able to:
- Describe the concepts of governance
- Describe the key elements of a governance plan
- Plan for governance in SharePoint Server 2013

Module 14: Upgrading and Migrating to SharePoint Server 2013

Upgrading your Microsoft SharePoint Server 2010 farm(s) to SharePoint 2013 is a major undertaking, so it is important that you carefully plan the upgrade activities. You need to ensure that your upgrade path—moving from version to version—is supported, that you have reviewed the business impact of your upgrade, and that you test your upgrade strategy to ensure business continuity. As with all such activities, preparation is crucial.

In contrast with earlier version of SharePoint, SharePoint 2013 supports only database-attach upgrades for content, but it now supports upgrades for some of the databases associated with service applications. You need to plan for these and ensure that you are prepared for any troubleshooting that may be required.

Another change in SharePoint 2013 is the approach to upgrading site collections. These are upgraded separately from the data and service applications. You can also delegate the upgrade tasks to site collection administrators.

Lessons
- Preparing the Upgrade for Migration Environment
- Performing the Upgrade Process
- Managing a Site Collection Upgrade

Lab: Performing a Database-Attach Upgrade
- Import the SharePoint 2010 Database
- Migrating and Upgrading a Service Application
- Migrating and Upgrading a Content Database

Lab: Managing Site Collection Upgrades
- Preparing Site Collections for Upgrade
- Upgrading Site Collections

After completing this module, students will be able to:
- Describe how to plan and prepare for your upgrade
• Explain the steps involved in data and service application upgrades
• Describe the process for upgrading Site Collections
Core Solutions of Microsoft Exchange Server 2013
Course 20341B

About this Course

This course will provide you with the knowledge and skills to plan, deploy, manage, secure, and support Microsoft Exchange Server 2013. This course will teach you how to configure Exchange Server 2013 and supply you with the information you will need to monitor, maintain, and troubleshoot Exchange Server 2013. This course will also provide guidelines, best practices, and considerations that will help you optimize performance and minimize errors and security threats in Exchange Server 2013.

Audience Profile

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. They are not expected to have experience with previous Exchange Server versions.

The secondary audience for this course will be candidates that are IT professionals who are looking to take the exam 70-341: Core Solutions of Microsoft Exchange Server 2013 as a standalone, or as part of the requirement for the Microsoft Certified Solutions Expert (MCSE) certification.

At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Server 2013.
- Plan for disaster mitigation; implement backup and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solution, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Prerequisites

Before attending this course, students must have:

- Minimum of two years of experience working with Active Directory Domain Services (AD DS).
- Minimum of two years of experience working with name resolution, including DNS.
- Experience working with certificates, including PKI certificates.
Course Outline

Module 1: Deploying and Managing Microsoft Exchange Server 2013

This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.

Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Lab: Deploying and Managing Exchange Server 2013

- Evaluating Requirements and Prerequisites for an Exchange Server 2013 Installation
- Deploying Exchange Server 2013
- Managing Exchange Server 2013

After completing this module, students will be able to:

- Describe Exchange Server 2013 prerequisites and requirements.
- Perform an Exchange Server 2013 deployment.
- Manage Exchange Server 2013.

Module 2: Planning and Configuring Mailbox Servers.

This module describes how to plan and configure the Mailbox server role.

Lessons

- Overview of the Mailbox Server Role
- Planning the Mailbox Server Deployment
- Configuring the Mailbox Servers

Lab: Configuring Mailbox Servers

- Planning Configuration for Mailbox Servers
- Configuring Storage on the Mailbox Servers
- Creating and Configuring Mailbox Databases

After completing this module, students will be able to:

- Describe the Mailbox server role.
- Plan for a Mailbox server role deployment.
- Configure the Mailbox servers.

Module 3: Managing Recipient Objects

This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

- Managing Exchange Server 2013 Mailboxes
- Managing Other Exchange Recipients
- Planning and Implementing Public Folder Mailboxes
- Managing Address Lists and Policies

Lab: Managing Recipient Objects

- Configuring Address Lists and Policies for Trey Research
- Configuring Public Folders for Trey Research

After completing this module, students will be able to:

- Manage Exchange Server 2013 mailboxes.
- Manage other Exchange Server 2013 recipients.
- Implement public folders.
- Configure address lists and policies.

Module 4: Planning and Deploying Client Access Servers

This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

- Planning Client Access Server Deployment
- Configuring the Client Access Server Role
- Managing Client Access Services

Lab: Deploying and Configuring a Client Access Server Role

- Configuring Certificates for the Client Access Server
- Configuring Client Access Services Options
- Configuring Custom MailTips

After completing this module, students will be able to:

- Plan Client Access server deployment.
- Configure the Client Access server roles.
- Manage Client Access services.

Module 5: Planning and Configuring Messaging Client Connectivity

This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

- Client Connectivity to the Client Access Server
- Configuring Outlook Web App
- Planning and Configuring Mobile Messaging
- Configuring Secure Internet Access for Client Access Server

Lab: Planning and Configuring Messaging Client Connectivity

- Planning Client Connectivity
- Configuring Outlook Web App and Outlook Anywhere
- Configuring Exchange ActiveSync
- Publishing Exchange Server 2013 through TMG 2010

After completing this module, students will be able to:

- Describe the client services Exchange Server 2013 provides.
- Configure Outlook Web App.
- Plan and configure mobile messaging.
- Configure secure Internet access for Client Access server.
Module 6: Planning and Implementing High Availability

This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons
- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Lab: Implementing High Availability

- Creating and Configuring a Database Availability Group
- Deploying Highly Available Client Access Servers
- Testing the High-Availability Configuration

After completing this module, students will be able to:
- Describe high availability in Exchange Server 2013.
- Configure highly available mailbox databases.
- Configure highly available Client Access servers.

Module 7: Planning and Implementing Disaster Recovery

This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons
- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Lab: Implementing Disaster Recovery for Exchange Server 2013

- Backing Up Exchange 2013
- Restoring Exchange Server 2013 Data

After completing this module, students will be able to:
- Plan disaster mitigation.
- Plan and implement Exchange Server 2013 backup.
- Plan and implement Exchange Server 2013 recovery.

Module 8: Planning and Configuring Message Transport

This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons
- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Lab: Planning and Configuring Message Transport

- Configuring Message Transport
- Troubleshooting Message Delivery
- Configuring Transport Rules and Data-Loss Prevention Policies

After completing this module, students will be able to:
- Describe message transport in Exchange Server 2013.
- Plan and configure message transport.
- Manage transport rules.

Module 9: Planning and Configuring Message Hygiene

This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons
- Planning Messaging Security
- Implementing an Anti-Virus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Lab: Planning and Configuring Message Security

- Configuring Antimalware Options in Exchange Server 2013
- Configuring Anti-Spam Options on Exchange Server
- Validating Antimalware and Anti-Spam Configuration

After completing this module, students will be able to:
- Plan messaging security.
- Implement an antivirus solution for Exchange Server 2013.

Module 10: Planning and Configuring Administrative Security and Auditing

This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons
- Configuring Role-Based Access Control
- Configuring Audit Logging

Lab: Configuring Administrative Security and Auditing

- Configuring Exchange Server Permissions
- Configuring Audit Logging
- Configuring RBAC Split Permissions on Exchange Server 2013

After completing this module, students will be able to:
- Configure RBAC permissions.
- Configure audit logging.

Module 11: Monitoring and Troubleshooting Microsoft Exchange Server 2013

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons
- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
### Lab: Monitoring and Troubleshooting Exchange Server 2013

- Monitoring Exchange Server
- Troubleshooting Database Availability
- Troubleshooting Client Access Servers

### After completing this module, students will be able to:

- Troubleshoot Exchange Server 2013.
About this Course

Get hands-on instruction and practice installing and configuring Windows Server 2012, including Windows Server 2012 R2, in this five-day Microsoft Official Course. This course is part one in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment. The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on the initial implementation and configuration of core services, such as Networking, Storage, Active Directory Domain Services (AD DS), Group Policy, File and Print Services, and Hyper-V. This course maps directly to and is the preferred choice for hands-on preparation for the Microsoft Certified Solutions Associate (MCSA) Exam 410: Installing and Configuring Windows Server 2012, which is the first of three exams required for the MCSA: Windows Server 2012 credential. Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for information technology (IT) professionals who have some knowledge and experience working with Windows operating systems and who want to acquire the skills and knowledge necessary to install and perform the initial configuration of a Windows Server 2012 or Windows Server 2012 R2 server in an existing Windows server environment. Typically, candidates who are interested in attending this course include:

- Windows Server administrators who are relatively new to Windows Server administration and related technologies who are looking to learn more about Windows Server 2012 and Windows Server 2012 R2.
- IT professionals who are experienced in other non-Microsoft technologies, who meet the course prerequisites and are looking to cross-train on Windows Server 2012 and Windows Server 2012 R2.
- IT professionals who are looking to take the Microsoft Certified Solutions Associate (MCSA)-410: Installing and Configuring Windows Server 2012 exam.
- IT professionals who want to take the Microsoft Certified Solutions Expert (MCSE) exams in Data Center, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the Microsoft Certified Solutions Associate (MCSA) exams. These are a prerequisite for their individual specialties.

At Course Completion

After completing this course, students will be able to:

- Install and configure Windows Server 2012.
- Describe AD DS.
- Manage Active Directory objects.
- Automate Active Directory administration.
- Implement IPv4.
- Implement Dynamic Host Configuration Protocol (DHCP).
• Implement Domain Name System (DNS).
• Implement IPv6.
• Implement local storage.
• Implement file and print services.
• Implement Group Policy.
• Secure Windows servers by using Group Policy Objects (GPOs).
• Implement server virtualization by using Hyper-V

Prerequisites

This course requires that student meet the following prerequisites, including that they have:

• An understanding of networking fundamentals.
• An understanding of basic AD DS concepts.
• An awareness and understanding of security best practices.
• Basic knowledge of server hardware.
• Experience working with, and configuring, Windows client operating systems, such as Windows 7 or Windows 8.

Additionally, students would benefit from having some previous Windows Server operating system experience.

All of the above prerequisites can be met by having knowledge equivalent to, or by attending, course 10967A: Fundamentals of a Windows Server Infrastructure because this course builds upon knowledge and skills covered in that course.


This module introduces students to the editions of Windows Server 2012 and the new Windows Server 2012 management tools. It also covers how to install Windows Server 2012, how to perform post-deployment tasks, and how to perform basic administrative tasks.

Lessons

• Windows Server 2012 Overview
• Installing Windows Server 2012
• Post-Installation Configuration of Windows Server 2012
• Overview of Windows Server 2012 Management
• Introduction to Windows PowerShell

Lab: Deploying and Managing Windows Server 2012

• Deploying Windows Server 2012
• Configuring Windows Server 2012 Server Core
• Managing Servers
• Using Windows PowerShell to Manage Servers

After completing this module, students will be able to:

• Describe Windows Server 2012.
• Install Windows Server 2012.
• Perform post-installation configuration of Windows Server 2012.
• Describe the management tools available in Windows Server 2012.
• Perform basic administrative tasks using Windows PowerShell.

Module 2: Introduction to Active Directory Domain Services.
This module covers the structure of Active Directory Domain Services (AD DS) and its various components, such as forest, domain, and organizational units (OUs). It also gives an overview of domain controllers, in addition to choices that are available with Windows Server 2012 for installing AD DS on a server.

Lessons
• Overview of AD DS
• Overview of Domain Controllers
• Installing a Domain Controller

Lab: Installing Domain Controllers
• Installing a Domain Controller
• Installing a Domain Controller by Using IFM

After completing this module, students will be able to:
• Describe the structure of AD DS.
• Describe the purpose of domain controllers.
• Install a domain controller.

Module 3: Managing Active Directory Domain Services Objects.
This module describes how to manage user accounts and computer accounts, including how to manage various consumer devices that employees use. The module also covers how to manage an enterprise network by managing groups, and how to delegate administrative tasks to designated users or groups.

Lessons
• Managing User Accounts
• Managing Groups
• Managing Computer Accounts
• Delegating Administration

Lab: Managing Active Directory Domain Services Objects
• Delegating Administration for a Branch Office
• Creating and Configuring User Accounts in AD DS
• Managing Computer Objects in AD DS

After completing this module, students will be able to:
• Manage user accounts with graphical tools.
• Manage group accounts with graphical tools.
• Manage computer accounts.
• Delegate permissions to perform AD DS administration.

Module 4: Automating Active Directory Domain Services Administration.
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons
• Using Command-line Tools for AD DS Administration
• Using Windows PowerShell for AD DS Administration
• Performing Bulk Operations with Windows PowerShell

Lab: Automating AD DS Administration by Using Windows PowerShell
• Creating User Accounts and Groups by Using Windows PowerShell
• Using Windows PowerShell to Create User Accounts in Bulk
• Using Windows PowerShell to Modify User Accounts in Bulk
After completing this module, students will be able to:

- Use command-line tools for AD DS administration.
- Use Windows PowerShell cmdlets for AD DS administration.
- Perform bulk operations by using Windows PowerShell.

Module 5: Implementing IPv4

This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks.

In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

Lab: Implementing IPv4

- Identifying Appropriate Subnets
- Troubleshooting IPv4

After completing this module, students will be able to:

- Describe the TCP/IP protocol suite.
- Describe IPv4 addressing.
- Determine a subnet mask necessary for supernetting or subnetting.
- Configure IPv4 and troubleshoot IPv4 communication.


This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Lab: Implementing DHCP

- Implementing DHCP
- Implementing a DHCP Relay Agent (Optional Exercise)

After completing this module, students will be able to:

- Explain the DHCP server role.
- Configure DHCP scopes.
- Manage a DHCP database.
- Secure and monitor the DHCP server role.

Module 7: Implementing DNS.

This module describes name resolution for Windows operating system clients and Windows Server servers.

It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Lab: Implementing DNS

- Installing and Configuring DNS
- Creating Host Records in DNS
- Managing the DNS Server Cache
Module 8: Implementing IPv6
This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Lab: Implementing IPv6

- Configuring an IPv6 Network
- Configuring an ISATAP Router

After completing this module, students will be able to:

- Describe the features and benefits of IPv6.
- Describe IPv6 addressing.
- Describe IPv6 coexistence with IPv4.
- Describe IPv6 transition technologies.

Module 9: Implementing Local Storage
This module introduces several different storage technologies.
It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Lab: Implementing Local Storage

- Installing and Configuring a New Disk
- Resizing Volumes
- Configuring a Redundant Storage Space

After completing this module, students will be able to:

- Describe various storage technologies.
- Explain how to manage disks and volumes.
- Explain how to implement Storage Spaces.

Module 10: Implementing File and Print Services
This module discusses how to provide file and print resources with Windows Server 2012.
It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.

Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

Lab: Implementing File and Print Services

- Creating and Configuring a File Share
- Configuring Shadow Copies
- Enabling and Configuring Work Folders
- Creating and Configuring a Printer Pool

After completing this module, students will be able to:
• Secure shared files and folders.
• Protect shared files and folders by using shadow copies.
• Configure the Work Folders role service.
• Configure network printing.

Module 11: Implementing Group Policy. This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

• Overview of Group Policy
• Group Policy Processing
• Implementing a Central Store for Administrative Templates

Lab: Implementing Group Policy

• Configuring a central store
• Creating GPOs

After completing this module, students will be able to:

• Create and manage Group Policy Objects (GPOs).
• Describe Group Policy processing.
• Implement a Central Store for Administrative Templates.

This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

• Security Overview for Windows Operating Systems
• Configuring Security Settings
• Restricting Software

• Configuring Windows Firewall with Advanced Security

Lab: Increasing Security for Server Resources

• Using Group Policy to Secure Member Servers
• Auditing File System Access
• Auditing Domain Logons

Lab: Configuring AppLocker and Windows Firewall

• Configuring AppLocker Policies
• Configuring Windows Firewall

After completing this module, students will be able to:

• Describe Windows Server operating system security.
• Configure security settings by using Group Policy.
• Increase security for server resources.
• Restrict unauthorized software from running on servers and clients.
• Configure Windows Firewall with Advanced Security.

Module 13: Implementing Server Virtualization with Hyper-V.
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

• Overview of Virtualization Technologies
• Implementing Hyper-V
• Managing Virtual Machine Storage
• Managing Virtual Networks
Lab: Implementing Server Virtualization with Hyper-V

- Installing the Hyper-V Role onto a Server
- Configuring Virtual Networking
- Creating and Configuring a Virtual Machine
- Using Virtual Machine Checkpoints

After completing this module, students will be able to:

- Describe virtualization technologies.
- Implement Hyper-V.
- Manage virtual machine storage.
- Manage virtual networks.
Get hands-on instruction and practice administering Windows Server 2012, including Windows Server 2012 R2, in this five-day Microsoft Official Course. This course is part two in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment. The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on the administration tasks necessary to maintain a Windows Server 2012 infrastructure such as configuring and troubleshooting name resolution, user and group management with Active Directory Domain Services (AD DS) and Group Policy, implementing Remote Access solutions such as Direct Access, VPNs and Web Application Proxy, implementing Network Policies and Network Access Protection, Data Security, deployment and maintenance of server images, as well as update management and monitoring of Windows Server 2012 environments. This course maps directly to and is the preferred choice for hands-on preparation for Microsoft Certified Solutions Associate (MCSA): Exam 411: Administering Windows Server 2012, which is the second of three exams required for MCSA: Windows Server 2012 credential. Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment. The key focus for students is to broaden the initial deployment of Windows Server 2012 services and infrastructure and provide the skills necessary to manage and maintain a domain based Windows Server 2012 environment, providing skills in areas such as User and Group management, Network Access and Data Security. Candidates typically interested in attending this course would be:


- IT Professionals who are looking to take the 411, Administering Windows Server 2012 exam
- IT professional wishing to take the Microsoft Certified Solutions Expert (MCSE) exams in Data Center, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the Microsoft Certified Solutions Associate (MCSA) exams, which are a pre-requisite for their individual specialties.
After completing this course, students will be able to:

- Configure and Troubleshoot Domain Name System
- Maintain Active Directory Domain Services
- Manage User and Service Accounts
- Implement Group Policy Infrastructure
- Manage User Desktops using Group Policy
- Install, Configure and Troubleshoot Network Policy Server
- Implement Network Access Protection
- Implement Remote Access
- Optimize File Services
- Configure Encryption and Advanced Auditing
- Deploy and Maintain Server Images
- Implement Update Managements
- Monitor Windows Server 2012

Before attending this course, students must have:

- Knowledge and skills concerning the initial implementation and configuration of core Windows Server services including Active Directory Domain Services (AD DS), Networking Services and Microsoft Hyper-V.

The course pre-requisites can be met by having knowledge equivalent to, or by attendance at, course 20410D: Installing and Configuring Windows Server 2012, as this course will build upon that knowledge and skills covered in that course.
• Configuring the DNS Server Role
• Configuring DNS Zones
• Configuring DNS Zone Transfers
• Managing and Troubleshooting DNS

Lab: Configuring and Troubleshooting DNS

• Configuring DNS Resource Records
• Configuring DNS Conditional Forwarding
• Installing and Configuring DNS Zones
• Troubleshooting DNS

After completing this module, students will be able to:

• Install and configure the DNS server role.
• Create and configure DNS zones.
• Configure DNS zone transfers.
• Manage and troubleshoot DNS.

Module 2: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons

• Overview of AD DS
• Implementing Virtualized Domain Controllers
• Implementing RODCs
• Administering AD DS
• Managing the AD DS Database

Lab: Maintaining AD DS

• Installing and Configuring a RODC
• Configuring AD DS Snapshots
• Configuring the Active Directory Recycle Bin

• Optional Exercise- Cloning a domain controller

After completing this module, students will be able to:

• Implement virtualized domain controllers.
• Implement RODCs.
• Administer AD DS.
• Manage the AD DS database

Module 3: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts. It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons

• Configuring Password Policy and User Account Lockout Settings
• Configuring Managed Service Accounts

Lab: Managing User and Service Accounts

• Configuring Password Policy and Account Lockout Settings
• Creating and Associating a Managed Service Account

After completing this module, students will be able to:

• Configure password policy and user account lockout settings.
• Configure managed service accounts.

Module 4: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform
common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

- Introducing Group Policy
- Implementing and Administering GPOs
- Group Policy Scope and Group Policy Processing
- Troubleshooting the Application of GPOs

Lab : Implementing a Group Policy Infrastructure

- Creating and Configuring Group Policy Objects
- Managing GPO Scope
- Verifying GPO Application
- Managing GPOs

After completing this module, students will be able to:

- Explain what Group Policy is.
- Implement and administer Group Policy Objects (GPOs).
- Manage Group Policy scope and Group Policy processing.
- Troubleshoot the application of GPOs.

Module 5: Managing User Desktops with Group Policy

This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts

Lab : Managing User Desktops with Group Policy

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Lab : Managing User Desktops with Group Policy

- Implement Settings by Using Group Policy Preferences
- Managing Office 2013 by using Administrative Templates
- Deploying Software by using Group Policy
- Configuring Folder Redirection

After completing this module, students will be able to:

- Configure folder redirection and scripts by using GPOs.
- Describe and implement Administrative Templates.
- Configure GPO preferences.
- Deploy software by using GPOs.

Module 6: Installing, Configuring, and Troubleshooting the Network Policy Server Role

This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describe NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons

- Installing and Configuring a Network Policy Server
- Configuring RADIUS Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a Network Policy Server

Lab : Installing and Configuring a Network Policy Server

- Installing and Configuring NPS to Support
RADIUS
• Configuring and Testing a RADIUS Client

After completing this module, students will be able to:
• Install and configure a Network Policy Server (NPS).
• Configure clients and servers with the Remote Authentication Dial-In User Service (RADIUS) protocol.
• Explain NPS authentication methods.
• Monitor and troubleshoot NPS.

Module 7: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons
• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Configuring IPSec Enforcement for NAP
• Monitoring and Troubleshooting NAP

Lab: Implementing Network Access Protection
• Configuring NAP Components
• Configuring Virtual Private Network Access
• Configuring the Client Settings to Support NAP

After completing this module, students will be able to:
• Describe how NAP can help to protect your network.
• Describe the various NAP enforcement processes.

Module 8: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons
• Overview of Remote Access
• Implementing DirectAccess by Using the Getting Started Wizard
• Implementing and Managing an Advanced DirectAccess Infrastructure
• Implementing VPN
• Implementing Web Application Proxy

Lab: Implementing DirectAccess by Using the Getting Started Wizard
• Verifying Readiness for a DirectAccess Deployment
• Configuring DirectAccess
• Validating the DirectAccess Deployment

Lab: Deploying an Advanced DirectAccess Solution
• Preparing the Environment for DirectAccess
• Implementing the Advanced DirectAccess Infrastructure
• Validating the DirectAccess Deployment

Lab: Implementing VPN
• Implementing VPN
• Validating the VPN Deployment

Lab: Implementing Web Application Proxy
• Implementing Web Application Proxy
• Validating the Web Application Proxy
Deployment

After completing this module, students will be able to:

- Install and manage the Remote Access role in Windows Server 2012 operating system.
- Implement DirectAccess by using the Getting Started Wizard.
- Implement and manage an advanced DirectAccess Infrastructure.
- Implement VPN access.
- Implement Web Application Proxy.

Module 9: Optimizing File Services
This module describes FSRM, configure quotas, file screening and storage reports and implement classification management and file management tasks. It describes the components of the DFS. I also explain how to configure DFS namespaces and DFS replication.

Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of DFS
- Configuring DFS Namespaces
- Configuring and Troubleshooting DFS Replication

Lab : Configuring Quotas and File Screening Using File Server Resource Manager

- Configuring File Server Resource Manager Quotas
- Configuring File Screening and Storage Reports

Lab : Implementing Distributed File System

- Installing the DFS role service

Module 10: Configuring Encryption and Advanced Auditing
This module explains how to encrypt files using EFS and configure advanced auditing features.

Lessons

- Encrypting Drives by Using BitLocker
- Encrypting Files by Using EFS
- Configuring Advanced Auditing

Lab : Configuring Encryption and Advanced Auditing

- Using Windows BitLocker Drive Encryption to Secure Data Drives
- Encrypting and Recovering Files
- Configuring Advanced Auditing

After completing this module, students will be able to:

- Secure data by using BitLocker Drive Encryption.
- Encrypt files by using Encrypting File System (EFS).
- Configure advanced auditing.
### Module 11: Deploying and Maintaining Server Images
This module explains how to create and manage server images by using Windows Deployment Services.

#### Lessons
- Overview of Windows Deployment Services
- Managing Images
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services

#### Lab: Using Windows Deployment Services to Deploy Windows Server 2012
- Installing and Configuring Windows Deployment Services
- Creating Operating System Images with Windows Deployment Services
- Configuring Custom Computer Naming
- Deploying Images with Windows Deployment Services

After completing this module, students will be able to:

- Describe the important features and functionality of Windows Deployment Services (Windows DS).
- Manage images by using Windows Assessment and Deployment Kit (Windows ADK) Tools.
- Perform deployments with Windows Deployment Services.

### Module 12: Implementing Update Management
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

#### Lessons
- Overview of WSUS
- Deploying Updates with WSUS

#### Lab: Implementing Update Management
- Implementing the WSUS Server Role
- Configuring Update Settings
- Approving and Deploying an Update by using WSUS

After completing this module, students will be able to:

- Describe the role of WSUS.
- Describe the WSUS update management process.
- Deploy updates with WSUS.

### Module 13: Monitoring Windows Server 2012
This module explains the monitoring tools available in Windows Server 2012. It also explains how to use Performance Monitor and monitor events.

#### Lessons
- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

#### Lab: Monitoring Windows Server 2012
- Establishing a Performance Baseline
- Identifying the Source of a Performance Problem
- Viewing and Configuring Centralized Event Logs

After completing this module, students will be able to:

- Describe the monitoring tools for the
Windows Server 2012 operating system.

- Use Performance Monitor to view and analyze performance statistics of programs that are running on their servers.
- Monitor event logs to view and interpret the recorded events.
Configuring Advanced Windows Server 2012 Services
Course 20412D

About this Course

Get hands-on instruction and practice configuring advanced Windows Server 2012, including Windows Server 2012 R2, services in this five-day Microsoft Official Course. This course is part three in a series of three courses that provides the skills and knowledge necessary to implement a core Windows Server 2012 infrastructure in an existing enterprise environment.

The three courses collectively cover implementing, managing, maintaining and provisioning services and infrastructure in a Windows Server 2012 environment. Although there is some cross-over of skills and tasks across these courses, this course focuses on advanced configuration of services necessary to deploy, manage and maintain a Windows Server 2012 infrastructure, such as advanced networking services, Active Directory Domain Services (AD DS), Active Directory Rights Management Services (AD RMS), Active Directory Federation Services (AD FS), Network Load Balancing, Failover Clustering, business continuity and disaster recovery services as well as access and information provisioning and protection technologies such as Dynamic Access Control (DAC), and Web Application Proxy integration with AD FS and Workplace Join.

This course maps directly to and is the preferred choice for hands-on preparation for Microsoft Certified Solutions Associate (MCSA): Exam 412: Configuring Advanced Windows Server 2012 Services, which is the third of three exams required for MCSA: Windows Server 2012 credential.

Note: Labs in this course are based on Windows Server 2012 R2 and Windows 8.1.

Audience Profile

This course is intended for Information Technology (IT) Professionals with hands on experience implementing, managing and maintaining a Windows Server 2012 or Windows Server 2012 R2 environment who wish to acquire the skills and knowledge necessary to perform advanced management and provisioning of services within that Windows Server 2012 environment. Candidates who would typically be interested in attending this course will be:

- Experienced Windows Server Administrators who have real world experience working in a Windows Server 2008 or Windows Server 2012 enterprise environment.
- IT Professionals who are looking to take the exam 412: Configuring Advanced Windows Server 2012 Services.
- IT Professionals wishing to take the Microsoft Certified Solutions Expert (MCSE) exams in Datacenter, Desktop Infrastructure, Messaging, Collaboration and Communications will also be interested in taking this course as they prepare for the MCSA exams, which are a pre-requisite for their individual specialties.
At Course Completion

After completing this course, students will be able to:

- Configure advanced features for Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), and configure IP Address Management (IPAM) with Windows Server 2012.
- Configure and manage iSCSI, BranchCache and FSRM.
- Configure DAC to manage and audit access to shared files.
- Plan and implement an AD DS deployment that includes multiple domains and forests.
- Plan and implement an AD DS deployment that includes locations.
- Implement and configure an Active Directory Certificate Services (AD CS) deployment.
- Implement an AD RMS deployment.
- Implement an AD FS deployment.
- Provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).
- Implement and validate high availability and load balancing for web-based applications by implementing NLB.
- Provide high availability for network services and applications by implementing failover clustering.
- Implement a failover cluster, and configure and validate a highly available network service.
- Deploy and manage Hyper-V virtual machines in a failover cluster.
- Implement a backup and disaster recovery solution based on business and technical requirements.

Prerequisites

Before attending this course, students must have:

- Experience working with Windows Server 2008 or Windows Server 2012 servers day to day in an Enterprise environment.

The course pre-requisites can be met by having knowledge equivalent to, or by attendance at, courses 20410C: Installing and Configuring Windows Server 2012 and 20411C: Administering Windows Server 2012 as this course will build upon the knowledge and skills covered in those courses.

Course Outline

Module 1: Implementing Advanced Network Services
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

Lab: Implementing Advanced Network Services

- Configuring Advanced DHCP Settings
- Configuring Advanced DNS Settings
- Configuring IPAM

After completing this module, students will be able to:

- Configure advanced features in DHCP with Windows Server 2012.
- Configure the advanced DNS settings in Windows Server 2012.
- Implement IP Address Management in Windows Server 2012.

Module 3: Implementing Dynamic Access Control
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

Lab: Implementing Secure Data Access

- Preparing for DAC deployment
- Implementing DAC
- Validating and Remediating DAC
- Implementing Work Folders

After completing this module, students will be able to:

- Describe DAC.
- Implement and configure components of DAC.
- Implement DAC on file servers.
- Describe and implement access-denied assistance.
- Implement the integration of Work Folders with DAC.
Module 4: Implementing Distributed Active Directory Domain Services Deployments
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons
- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Lab: Implementing Distributed AD DS Deployments
- Implementing Child Domains in AD DS
- Implementing Forest Trusts

After completing this module, students will be able to:
- Describe the components of a highly complex AD DS deployment.
- Implement a complex AD DS deployment.
- Configure AD DS trusts.

Module 5: Implementing Active Directory Domain Services Sites and Replication
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons
- AD DS Replication Overview
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Lab: Implementing AD DS Sites and Replication
- Modifying the Default Site

Module 6: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons
- Using Certificates in a Business Environment
- PKI Overview
- Deploying CAs
- Deploying and Managing Certificate Templates
- Implementing Certificate Distribution and Revocation
- Managing Certificate Recovery

Lab: Deploying and Configuring CA Hierarchy
- Deploying a Stand-Alone Root CA
- Deploying an Enterprise Subordinate CA

Lab: Deploying and Managing Certificates
- Configuring Certificate Templates
- Configuring Certificate Enrollment
- Configuring Certificate Revocation
- Configuring Key Recovery

After completing this module, students will be able to:
- Describe how replication works in a Windows Server 2012 AD DS environment.
- Configure AD DS sites in order to optimize AD DS network traffic.
- Configure and monitor AD DS replication.
• Describe and use certificates in business environments.
• Describe the Public Key Infrastructure (PKI) components and concepts, and describe the options for implementing a certification authority infrastructure.
• Plan and implement an AD CS certification authority infrastructure.
• Plan and implement a certificate template deployment using an AD CS certification authority.
• Plan and implement certificate distribution and revocation.
• Configure and manage key archival and recovery.

Module 7: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Lab: Implementing AD RMS

• Installing and Configuring AD RMS
• Configuring AD RMS Templates
• Implementing the AD RMS Trust Policies
• Verifying AD RMS on a Client

After completing this module, students will be able to:

• Describe what AD RMS is, and how it can be used to achieve content protection.
• Deploy and manage an AD RMS infrastructure.

• Configure content protection using AD RMS.
• Enable users outside the organization to access content protected by using AD RMS.

Module 8: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Lab: Implementing AD FS

• Installing and Configuring AD FS
• Configuring an Internal Application for AD FS

Lab: Implementing AD FS for External Partners and Users

• Configuring AD FS for a Federated Business Partner
• Configuring Web Application Proxy

After completing this module, students will be able to:

• Describe the identity federation business scenarios and how AD FS can be used to address the scenarios.
• Configure the AD FS prerequisites and deploy the AD FS services.
• Implement AD FS to enable SSO in a single organization.
• Implement AD FS to enable SSO between federated partners.
Module 9: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons
- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Lab: Implementing NLB
- Implementing an NLB Cluster
- Configuring and Managing the NLB Cluster
- Validating High Availability for the NLB Cluster

After completing this module, students will be able to:
- Describe how NLB works.
- Configure an NLB cluster.
- Plan an NLB implementation.

Module 10: Implementing Failover Clustering
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

Lessons
- Overview of Failover Clustering
- Implementing a Failover Cluster
- Configuring Highly Available Applications and Services on a Failover Cluster
- Maintaining a Failover Cluster

Lab: Implementing Failover Clustering with Hyper-V
- Configuring Hyper-V Replicas
- Configuring a Failover Cluster for Hyper-V

Module 11: Implementing Failover Clustering with Hyper-V
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

Lessons
- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement

Lab: Implementing Failover Clustering with Hyper-V
- Configuring a Failover Cluster for Hyper-V

After completing this module, students will be able to:
- Describe how to implement a failover cluster.
- Explain how to configure highly available applications and services on a failover cluster.
- Explain how to maintain a failover cluster and how to use new maintenance features.
- Describe how to implement multi-site failover cluster.
• Configuring a Highly Available Virtual Machine

After completing this module, students will be able to:

• Explain options for making virtual machines highly available.
• Describe how to implement virtual machines in a failover cluster deployed on a host.
• Explain options for moving a virtual machine or its storage.
• Explain a high level overview of Microsoft System Center 2012- Virtual Machine Manager (VMM) 2012.

Module 12: Implementing Business Continuity and Disaster Recovery
In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements

Lessons

• Data Protection Overview
• Implementing Windows Server Backup
• Implementing Server and Data Recovery

Lab : Implementing Windows Server Backup and Restore

• Backing Up Data on a Windows Server 2012 R2 Server
• Restoring Files Using Windows Server Backup

After completing this module, students will be able to:

• Describe the considerations that must be included when you are implementing a disaster recovery solution.
• Plan and implement a backup solution for Windows Server 2012.
Implementing Data Models & Reports with Microsoft SQL Server
Course#: MS20466

Length: 5 Days
Audience: BI Developers
Technology: Microsoft SQL Server
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course
The focus of this five-day instructor-led course is on creating managed enterprise BI solutions. It describes how to implement multidimensional and tabular data models, deliver reports with Microsoft SQL Server Reporting Services, create dashboards with Microsoft SharePoint Server PerformancePoint Services, and discover business insights by using data mining.

Audience Profile
This course is intended for database professionals who need to fulfill a Business Intelligence Developer role to create analysis and reporting solutions. Primary responsibilities include:

- Implementing analytical data models, such as OLAP cubes.
- Implementing reports, and managing report delivery.
- Creating business performance dashboards.
- Supporting data mining and predictive analysis.

At Course Completion
After completing this course, students will be able to:

- Describe the components, architecture, and nature of a BI solution.
- Create a multidimensional database with Analysis Services.
- Implement dimensions in a cube.
- Implement measures and measure groups in a cube.
- Use MDX Syntax.
- Customize a cube.
- Implement a Tabular Data Model in SQL Server Analysis Services.
- Use DAX to enhance a tabular model.
- Create reports with Reporting Services.
- Enhance reports with charts and parameters.
- Manage report execution and delivery.
- Implement a dashboard in SharePoint Server with PerformancePoint Services.
- Use Data Mining for Predictive Analysis.

Prerequisites
This course requires that you meet the following prerequisites:

- At least 2 years’ experience of working with relational databases, including:
- Designing a normalized database.
• Creating tables and relationships.
• Querying with Transact-SQL.
• Some basic knowledge of data warehouse schema topology (including star and snowflake schemas).
• Some exposure to basic programming constructs (such as looping and branching).
• An awareness of key business priorities such as revenue, profitability, and financial accounting is desirable.

**Course Outline**

**Module 1: Introduction to Business Intelligence and Data Modeling**
As a SQL Server database professional, you may be required to participate in, or perhaps even lead, a project with the aim of implementing an effective enterprise BI solution. Therefore, it is important that you have a good understanding of the various elements that comprise a BI solution, the business and IT personnel typically involved in a BI project, and the Microsoft products that you can use to implement the solution.

Lessons

- Elements of an Enterprise BI Solution
- The Microsoft Enterprise BI Platform
- Planning an Enterprise BI Project

Lab: Exploring a BI Solution

- Exploring the Data Warehouse
- Exploring the Analysis Services Data Model
- Exploring Reports

After completing this module, you will be able to:

- Describe the elements of a typical BI solution.
- Select appropriate Microsoft technologies for a BI solution.
- Describe key considerations for planning a BI project.

**Module 2: Creating Multidimensional Databases**
This module provides an introduction to multidimensional databases and introduces the core components of an Online Analytical Processing (OLAP) cube.

Lessons

- Introduction to Multidimensional Analysis
- Creating Data Sources and Data Source Views
- Creating a Cube
- Overview of Cube Security

Lab: Creating a Multidimensional Database

- Creating a Data Source
- Creating and Modifying a Data Source View
- Creating and Modifying a Cube
- Adding a Dimension

After completing this module, you will be able to:

- Describe the considerations for a multidimensional database
- Create data sources and data source views
- Create a cube
- Implement security in a multidimensional database

**Module 3: Working with Cubes and Dimensions**
This module describes how to create and configure dimensions and dimension hierarchies in an Analysis Services multidimensional data model.

Lessons

- Configuring Dimensions
- Defining Attribute Hierarchies
- Sorting and Grouping Hierarchies

Lab: Defining Dimensions

- Configuring Dimensions and Attributes
- Creating Hierarchies
• Creating a Hierarchy with Attribute Relationships
• Creating a Ragged Hierarchy
• Browsing Dimensions and Hierarchies in a Cube

After completing this module, you will be able to:

• Configure dimensions
• Define attribute hierarchies
• Sort and group attributes

Module 4: Working with Measures and Measure Groups
This module describes measures and measure groups. It also explains how you can use them to define fact tables and associate dimensions with measures.

Lessons

• Working with Measures
• Working with Measure Groups

Lab: Configuring Measures and Measure Groups

• Configuring Measures
• Defining a Regular Relationship
• Configuring Measure Group Storage

After completing this module, you will be able to:

• Configure measures
• Configure measure groups

Module 5: Introduction to MDX
This module describes the fundamentals of MDX and explains how to build calculations, such as calculated members and named sets.

Lessons

• MDX Fundamentals
• Adding Calculations to a Cube
• Using MDX to Query a Cube

Lab: Using MDX

• Creating Calculated Members

Module 6: Enhancing a Cube
This module describes how to enhance a cube with Key Performance Indicators (KPIs), actions, perspectives, and translations.

Lessons

• Working with Key Performance Indicators
• Working with Actions
• Working with Perspectives
• Working with Translations

Lab: Customizing a Cube

• Implementing an Action
• Implementing Perspectives
• Implementing a Translation

After completing this module, you will be able to:

• Implement Key Performance Indicators
• Implement Actions
• Implement Perspectives
• Implement Translations

Module 7: Implementing an Analysis Services Tabular Data Model
This module describes Analysis Services tabular data models and explains how to develop a tabular data model using the SQL Server Data Tools for Business Intelligence (BI) add-in for Visual Studio.

Lessons

• Introduction to Analysis Services Tabular Data Models
• Creating a Tabular Data Model
• Using an Analysis Services Tabular Data Model in the Enterprise

• Querying a Cube by Using MDX

After completing this module, you will be able to:

• Describe MDX
• Add calculations to a cube
• Describe how to use MDX in client applications
Lab: Implementing an Analysis Services Tabular Data Model

- Creating an Analysis Services Tabular Data Model Project
- Configuring Columns and Relationships
- Deploying an Analysis Services Tabular Data Model

After completing this module, you will be able to:

- Describe Analysis Services tabular data model projects
- Implement an Analysis Services tabular data model
- Use an Analysis Services tabular data model

Module 8: Introduction to DAX
This module explains the fundamentals of the DAX language. It also explains how you can use DAX to create calculated columns and measures, and how you can use them in your tabular data models.

Lessons

- DAX Fundamentals
- Enhancing a Tabular Data Model with DAX

Lab: Using DAX to Enhance a Tabular Data Model

- Creating Calculated Columns
- Creating Measures
- Creating a KPI
- Implementing a Parent-Child Hierarchy

After completing this module, you will be able to:

- Describe the fundamentals of DAX
- Use DAX to create calculated columns and measures

Module 9: Implementing Reports with SQL Server Reporting Services
This module introduces Microsoft SQL Server Reporting Services and discusses the tools and techniques that a professional BI developer can use to create and publish reports.

Lessons

- Introduction to Reporting Services
- Creating a Report with Report Designer
- Grouping and Aggregating Data in a Report
- Publishing and Viewing a Report

Lab: Creating a Report with Report Designer

- Creating a Report
- Grouping and Aggregating Data
- Publishing a Report

After completing this module, you will be able to:

- Describe the key features of Reporting Services
- Use Report Designer to create a report
- Group and aggregate data in a report
- Publish and view a report

Module 10: Enhancing Reports with SQL Server Reporting Services
This module describes how to enhance a SQL Server reporting Services report with charts and other visualizations, and how to use parameters to filter data in a report.

Lessons

- Showing Data Graphically
- Filtering Reports by Using Parameters

Lab: Enhancing a Report

- Adding a Chart to a Report
- Adding Parameters to a Report
- Using Data Bars and Sparklines
- Using a Map

After completing this module, you will be able to:

- Use charts and other visualizations to show data graphically in a report
- Use parameters to filter data in a report
Module 11: Managing Report Execution and Delivery
This module describes how to apply security and report execution settings, and how to create subscriptions to deliver reports.

Lessons
- Managing Report Security
- Managing Report Execution
- Subscriptions and Data Alerts
- Troubleshooting Reporting Services

Lab: Configuring Report Execution and Delivery
- Configuring Report Execution
- Implementing a Standard Subscription
- Implementing a Data-Driven Subscription

After completing this module, you will be able to:
- Configure security settings for a report server.
- Configure report execution settings to optimize performance.
- Use subscriptions and alerts to automate report and data delivery.
- Troubleshoot reporting issues

Module 12: Delivering BI with SharePoint PerformancePoint Services
This module introduces Microsoft SharePoint Server as a platform for BI, and then focuses on building BI dashboards and scorecards with PerformancePoint Services.

Lessons
- Introduction to SharePoint Server as a BI Platform
- Introduction to PerformancePoint Services
- PerformancePoint Data Sources and Time Intelligence
- Reports, Scorecards, and Dashboards

Lab: Implementing a SharePoint Server BI Solution
- Creating a SharePoint Server Site for BI
- Configuring PerformancePoint Data Access
- Creating PerformancePoint Reports
- Creating a PerformancePoint Scorecard
- Creating a PerformancePoint Dashboard

Module 13: Performing Predictive Analysis with Data Mining
This module introduces data mining, describes how to create a data mining solution, how to validate data mining models, how to use the Data Mining Add-ins for Microsoft Excel, and how to incorporate data mining results into Reporting Services reports.

Lessons
- Overview of Data Mining
- Creating a Data Mining Solution
- Validating a Data Mining Model
- Consuming Data Mining Data

Lab: Using Data Mining to Support a Marketing Campaign
- Using Table Analysis Tools
- Creating a Data Mining Structure
- Adding a Data Mining Model to a Data Mining Structure
- Validating a Data Mining Model
- Using a Data Mining Model in a Report

After completing this module, you will be able to:
- Describe the key data mining concepts and use the Data Mining Add-ins for Excel
- Create a data mining solution
- Validate data mining models
- Use data mining data in a report
### About this Course

This five-day instructor-led course teaches students how to implement self-service Business Intelligence (BI) and Big Data analysis solutions using the Microsoft data platform. The course discusses the rationale for self-service BI, and describes how to use Microsoft SQL Server Reporting Services, Microsoft Excel, Microsoft SharePoint Server, and Microsoft Office 365 Power BI to create self-service data models and reports. The course then goes on to describe how to use Windows Azure HDInsight to perform Big Data analysis.

### Audience Profile

The primary audience for this course is database and business intelligence (BI) professionals who are familiar with data warehouses and enterprise BI solutions built with SQL Server technologies. Experienced data analysts who want to learn how to use Microsoft technologies for self-service analysis and reporting will also benefit from attending this course.

### At Course Completion

After completing this course, students will be able to:

- Describe key features and benefits of self-service BI.
- Use SQL Server Reporting Services to implement a self-service reporting solution.
- Use PowerPivot in Microsoft Excel to create analytical data models.
- Use Power Query in Microsoft Excel to import data into a data model.
- Use Power View in Microsoft Excel to create interactive data visualizations.
- Use Power Map in Microsoft Excel to create geographic data visualizations.
- Use Microsoft SharePoint Server to implement collaborative self-service BI solutions.
- Find and use public data in the Windows Azure Marketplace.
- Use Microsoft Office 365 Power BI to implement cloud-based self-service BI solutions.
- Provision and use a Windows Azure HDInsight cluster for Big Data analysis.
- Use Pig and Hive to analyze big data in Windows Azure HDInsight.
- Design and implement Big Data processes to support self-service BI.

### Prerequisites

This course requires that you meet the following prerequisites:

- Knowledge of data warehousing and data modeling principles.
- Familiarity with Microsoft Excel and Microsoft SharePoint Server 2013.
# Course Outline

## Module 1: Introduction to Self-Service Business Intelligence

This module introduces self-service BI.

**Lessons**

- Extending Enterprise BI
- Microsoft Self-Service BI and Big Data Technologies

**Lab: Exploring an Enterprise BI Solution**

- Viewing Reports
- Analyzing Data in a Data Model
- Analyzing Data from Multiple Sources

After completing this module, you will be able to:

- Describe ways in which an enterprise BI solution can be extended.
- Identify Microsoft technologies for self-service BI and Big Data analysis.

## Module 2: Self-Service Reporting

This module describes how to use Report Builder as a tool for self-service Microsoft SQL Server Reporting Services report authoring.

**Lessons**

- Introduction to Self-Service Reporting
- Shared Data Sources and Datasets
- Report Parts

**Lab: Implementing Self-Service Reporting**

- Using Report Builder
- Simplifying Data Access for Business Users
- Using Report Parts

After completing this module, you will be able to:


## Module 3: Self-Service Data Modeling with PowerPivot

This module describes how to use PowerPivot in Microsoft Excel to create self-service data models for analysis.

**Lessons**

- Creating Data Models in Excel with PowerPivot
- Using DAX in a PowerPivot Data Model

**Lab: Self-Service Data Modeling with PowerPivot**

- Creating a Data Model with PowerPivot
- Enhancing a Data Model
- Extending a Data Model

After completing this module, you will be able to:

- Use PowerPivot to create tabular data models in Excel.
- Enhance data models with custom DAX expressions.

## Module 4: Importing Data with Power Query

This lesson describes how to use Power Query in Microsoft Excel to find and import data.

**Lessons**

- Introduction to Power Query
- Using Power Query to Import Data

**Lab: Using Power Query**

- Importing data with Power Query
- Merging Queries
- Adding a Query to a Data Model

After completing this module, you will be able to:
**Module 5: Visualizing Data with Power View in Microsoft Excel**
This module describes how to use Power View in Microsoft Excel to create interactive data visualizations.

**Lessons**
- Introduction to Power View
- Creating Dynamic Data Visualizations

**Lab: Visualizing Data with Power View**
- Using Power View

After completing this module, you will be able to:
- Describe the features of Power View
- Use Power View to create interactive data visualizations in Excel

**Module 6: Visualizing Geographic Data with Power Map**
This module describes how to use Power Map in Microsoft Excel to create geographic data visualizations.

**Lessons**
- Introduction to Power Map
- Using Power Map

**Lab: Visualizing Geographic Data with Power Map**
- Creating a Power Map Tour
- Visualizing Data Over Time

After completing this module, you will be able to:
- Describe the features and usage scenarios of Power Map

**Module 7: Collaborative BI with Microsoft SharePoint Server.**
This module describes how to use Microsoft SharePoint Server in an enterprise environment to enable users to share PowerPivot workbooks and Power View reports.

**Lessons**
- Sharing PowerPivot Workbooks
- Managing PowerPivot Services in SharePoint Server
- Using Power View in SharePoint Server

**Lab: Using SharePoint Server for BI Collaboration**
- Sharing a PowerPivot Workbook
- Managing PowerPivot Data Refresh
- Using Power View in SharePoint Server

After completing this module, you will be able to:
- Share a PowerPivot workbook in SharePoint Server
- Manage PowerPivot services in SharePoint Server
- Use Power View to create interactive data visualizations in SharePoint Server

**Module 8: The Windows Azure Marketplace Data Market**
This module describes how to find and use datasets in the Windows Azure Marketplace.

**Lessons**
- Introduction to the Windows Azure Marketplace
- Using Windows Azure Marketplace Data in Microsoft Excel

**Lab: Using the Windows Azure Marketplace**
- Using Windows Azure Marketplace Data in Excel

- Use Power Map to create visualizations of geographic data
Module 9: Cloud Collaboration with Power BI for Microsoft Office 365
This module introduces Power BI for Microsoft Office 365, and describes how to use it for cloud-based, collaborative self-service BI.

Lessons
- Introduction to Power BI
- Natural Language Queries with Q&A
- Sharing Queries
- The Data Management Gateway

Lab: Using Power BI
- Provisioning Power BI
- Viewing Reports and Querying Data in Power BI
- Sharing Queries
- Cloud-Enabling a Data Source

Module 11: Processing Big Data with Pig and Hive
This module introduces Pig and Hive, and describes how you can use them to process Big Data in Windows Azure HDInsight.

Lessons
- Processing Big Data with Pig
- Processing Big Data with Hive

Lab: Processing Big Data with Pig and Hive
- Processing Big Data with Pig
- Processing Big Data with Hive

Module 12: Implementing Big Data Processing Solutions with Windows Azure HDInsight
This module introduces key Windows Azure HDInsight technologies that enable you to design and implement automated, repeatable Big Data processing solutions that support self-service BI.

Lessons
• Automating Big Data Processing Tasks
• Integrating Windows Azure HDInsight with Enterprise Data

Lab: Creating a Big Data Solution

• Using HCatalog to Abstract Storage Locations
• Using Oozie to Coordinate a Workflow
• Using Sqoop to Export Data

After completing this module, you will be able to:

• Design and implement an automated Big Data processing solution
• Integrate Windows Azure HDInsight with Self-Service BI Solutions
Course 50546
Microsoft Excel 2010 Step by Step, Level 3

Length: 1 Day
Audience: Information Workers
Technology: Microsoft Excel 2010
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course

This one-day instructor-led course provides students with the skills to analyze alternative data sets, create dynamic worksheets by using PivotTables, create charts and graphics, automate repetitive tasks, work with other Microsoft Office programs, and collaborate on workbooks.

Audience Profile

This course is intended for novice information workers who want to learn advanced-level Excel 2010 skills.

At Course Completion

After completing this course, students will be able to:

- Define an alternative data set.
- Define multiple alternative data sets.
- Vary your data to get a desired result by using Goal Seek.
- Find optimal solutions by using Solver.
- Analyze data by using descriptive statistics.
- Analyze data dynamically by using PivotTables.
- Filter, show, and hide PivotTable data.
- Edit PivotTables.
- Format PivotTables.
- Create PivotTables from external data.
- Create charts.
- Customize the appearance of charts.
- Find trends in your data.
- Summarize your data by using spark lines.
- Create dynamic charts by using Pivot Charts.
- Create diagrams by using SmartArt.
- Create shapes and mathematical equations.
- Enable and examine macros.
- Create and modify macros.
- Run macros when a button is clicked.
- Run macros when a workbook is opened.
- Include Office documents in workbooks.
- Store workbooks as parts of other Office documents.
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

- Create hyperlinks.
- Paste charts into other documents.
- Share workbooks.
- Manage comments.
- Track and manage colleagues’ changes.
- Protect workbooks and worksheets.
- Authenticate workbooks.
- Save workbooks for the Web.

Prerequisites

Before attending this course, students must have:

- Basic computer knowledge, such as keyboard and mouse skills.
- Basic file-management skills. The student should know how to navigate to folders and files on a computer running Windows 7.

Course Outline

Module 1: Analyze Alternative Data Sets
This module explains how to use alternative data sets to analyze the results of changes to your data.

Lessons

- Defining an Alternative Data Set
- Defining Multiple Alternative Data Sets
- Varying Your Data to Get a Desired Result by Using Goal Seek
- Finding Optimal Solutions by Using Solver
- Analyzing Data by Using Descriptive Statistics

Lab: Defining an Alternative Data Set
- Create a scenario

Lab: Defining Multiple Alternative Data Sets
- Create and view multiple scenarios; summarize scenario results in a separate worksheet

Lab: Varying Your Data to Get a Desired Result by Using Goal Seek
- Use Goal Seek to determine a solution

Lab: Finding Optimal Solutions by Using Solver
- Use Solver to determine a solution

Lab: Analyzing Data by Using Descriptive Statistics
- Use the Analysis Tool Pak to generate statistics

After completing this module, students will be able to:
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

• Define alternative data sets.
• Determine the necessary inputs to make a calculation produce a particular result.

Module 2: Create Dynamic Worksheets by Using PivotTables
This module explains how to use PivotTables to create worksheets that can be sorted, filtered, and rearranged dynamically to emphasize different aspects of the data.

Lessons
• Analyzing Data Dynamically by Using PivotTables
• Filtering, Showing, and Hiding PivotTable Data
• Editing PivotTables
• Formatting PivotTables
• Creating PivotTables from External Data

Lab: Analyzing Data Dynamically by Using PivotTables
• Create, edit, and pivot a PivotTable

Lab: Filtering, Showing, and Hiding PivotTable Data
• Filter a PivotTable by using multiple methods; show and hide details in a PivotTable

Lab: Editing PivotTables
• Rename and reconfigure a PivotTable; create a formula that references PivotTable data

Lab: Formatting PivotTables
• Apply a number format, PivotTable style, banded rows, and conditional formatting; create a custom PivotTable style

Lab: Creating PivotTables from External Data
• Create a PivotTable based on data you import from a text file

After completing this module, students will be able to:
• Create and edit PivotTables from an existing worksheet.
• Focus PivotTable data using filters and Slicers.
• Format PivotTables.
• Create a PivotTable with data from a text file.

Module 3: Create Charts and Graphics
This module explains how to show trends in data by creating charts to summarize a worksheet's data visually, and to use sparklines to summarize the data in a single cell. It also discusses changing the appearance of charts by changing formatting; creating a PivotChart dynamic view of data; adding shapes and mathematical equations; and creating diagrams.

Lessons
• Creating Charts
• Customizing the Appearance of Charts
• Finding Trends in Your Data
• Summarizing Your Data by Using Sparklines
• Creating Dynamic Charts by Using PivotCharts
• Creating Diagrams by Using SmartArt
• Creating Shapes and Mathematical Equations

Lab: Creating Charts
• Create, modify, and move a chart

Lab: Customizing the Appearance of Charts
• Modify the layout and style of a chart; format chart values; create and apply a chart template
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

**COURSE OUTLINE**

Lab: Finding Trends in Your Data
- Add a trendline to a chart

Lab: Summarizing Your Data by Using Sparklines
- Create, format, and clear Line, Column, and Win/Loss sparklines

Lab: Creating Dynamic Charts by Using PivotCharts
- Create, update, modify, and filter a PivotChart

Lab: Creating Diagrams by Using SmartArt
- Create, modify, and format an organization chart

Lab: Creating Shapes and Mathematical Equations
- Create, format, reorder, and align shapes; add text and equations to shapes

After completing this module, students will be able to:
- Create a chart and customize its elements.
- Find trends in overall data.
- Summarize data using sparklines.
- Create dynamic charts.
- Create and format shapes, diagrams, and shapes containing mathematical equations.

Lab: Enabling and Examining Macros
- Examine, step through, and run a macro

Lab: Creating and Modifying Macros
- Record, edit, save, and run a macro

Lab: Running Macros When a Button Is Clicked
- Add macro buttons to the Quick Access Toolbar; assign a macro to a shape; run a macro

Lab: Running Macros When a Workbook Is Opened
- Create and test a macro that runs automatically

After completing this module, students will be able to:
- Open, run, create, and modify macros.
- Create Quick Access Toolbar buttons and shapes in order to run macros with a single mouse click.
- Define macro security settings.
- Run a macro when a workbook is opened.

**Module 4: Automate Repetitive Tasks by Using Macros**
This module explains how to run and edit macros; make frequently used macros more accessible by assigning them to a new button on the Quick Access Toolbar; and create macros that run when a workbook is opened.

**Lessons**
- Enabling and Examining Macros
- Creating and Modifying Macros
- Running Macros When a Button is Clicked
- Running Macros When a Workbook is Opened

**Module 5: Work with Other Microsoft Office Programs**
Course 50546
Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

This module explains how to include Office documents in Excel workbooks, include Excel workbooks in documents, and create hyperlinks in files.

Lessons

- Including Office Documents in Workbooks
- Storing Workbooks as Parts of Other Office Documents
- Creating Hyperlinks
- Pasting Charts into Other Documents

Lab: Including Office Documents in Workbooks

- Link a presentation to an Excel workbook and edit the presentation from within Excel

Lab: Storing Workbooks as Parts of Other Office Documents

- Embed an Excel workbook in a PowerPoint presentation

Lab: Creating Hyperlinks

- Create internal and external hyperlinks

Lab: Pasting Charts into Other Documents

- Paste an image of a chart into a PowerPoint presentation

After completing this module, students will be able to:

- Include an Office 2010 document in a worksheet.
- Store an Excel workbook as part of another Office document.
- Create hyperlinks.
- Paste and Excel chart into another document.

Module 6: Collaborate with Colleagues

This module explains how to make workbooks available to other people; manage their comments; manage changes to workbooks from multiple users; add password protection; digitally sign a workbook; and save a workbook as a Web page.

Lessons

- Sharing Workbooks
- Managing Comments
- Tracking and Managing Colleagues' Changes
- Protecting Workbooks and Worksheets
- Authenticating Workbooks
- Saving Workbooks for the Web

Lab: Sharing Workbooks

- Share a workbook via e-mail

Lab: Managing Comments

- Add, display, review, and delete comments

Lab: Tracking and Managing Colleagues' Changes

- Track and accept changes; create a History worksheet

Lab: Protecting Workbooks and Worksheets

- Password-protect a workbook, a worksheet, and a range of cells; hide a formula

Lab: Authenticating Workbooks

- Create a digital certificate and digitally sign a workbook

Lab: Saving Workbooks for the Web
Course 50546

Learn Microsoft Excel 2010 Step by Step, Level 3

COURSE OUTLINE

- Save a workbook as a Web page; publish a PivotTable to the Web

After completing this module, students will be able to:

- Share a workbook.
- Manage comments in workbook cells.
- Track and manage changes made by colleagues.
- Protect workbooks and worksheets.
- Digitally sign workbooks.
- Save workbooks for the Web.
Windows 7, Enterprise Desktop Support Technician
Course#: MS 50331

About this Course

This five-day instructor-led course provides students with the knowledge and skills needed to isolate, document and resolve problems on a Windows 7 desktop or laptop computer. It will also help test takers prepare for the 70-685 and 70-682 exams.

Audience Profile

This course is intended for Windows 7 desktop support technicians who resolve Tier 1 and 2 problems on desktop computers. A minimum of three years of experience configuring and supporting desktop or laptop operating systems is recommended.

At Course Completion

After completing this course, students will be able to:

- Identify and Resolve Desktop Application Issues
- Identify the Cause of and Resolve Networking Issues
- Manage and Maintain Systems That Run Windows 7
- Support Mobile Users
- Identify the Cause of and Resolve Security Issues

Prerequisites

Before attending this course, students must have:

- TCP/IP Troubleshooting skills
- Experience working in a domain environment
- Experience using desktop and command-line troubleshooting tools
- Experience installing and troubleshooting desktop application problems
- Experience configuring registry and group policy settings

Course Outline

Module 1: Identify and Resolve New Software Installation Issues

This module explains how to fix problems that occur during the installation of new software.

Lessons

- Overview
MS 50331  
Windows 7, Enterprise Desktop Support Technician  

COURSE OUTLINE

- Planning New Software Deployment
  - Multilingual Deployment
  - Using Group Policy to install software
  - Using Software Restriction Policies
  - Digitally Signing Software
  - Using WMI
  - Using Applocker
  - Using Virtualization for Testing
  - Resolve Software Installation Issues
  - Review

Lab: Identify and Resolve New Software Installation Issues

- Create a Repair Disk and Installation Partitions
- Install and Configure Windows 7
- Install Programs and test Applocker
- Configure Compatibility Settings

After completing this module, students will be able to:

- Understand the different installation options for Windows 7
- Understand the different installation options for Windows 7 applications
- Resolve Windows 7 installation problems
- Prevent users from running unapproved applications

Module 2: Resolve Software Configuration Issues

This module explains how to fix application install problems caused by older programs or new features and options.

Lessons

- Overview
- Change Default Settings on the Image
- Enable and Disable Features
- Pointing to a Network Resource
- Configuring Updates

- Resolve Configuration Issues with Group Policy
  - Driver Updates
  - Problem Steps Recorder
  - Resolve Software Configuration Issues
  - Review

Lab: Resolve Software Configuration Issues

- Install the Windows Automated Installation Kit
- Create a Windows PE bootable image
- Create a VHD disk
- Install Windows 7 on a VHD
- Boot Windows 7 from a VHD
- Use the Problem Steps Recorder

After completing this module, students will be able to:

- Create a Windows 7 VHD disk
- Configure operating system features
- Understand the impact of Driver Updates
- Fix software configuration problems
- Use the Problem Steps Recorder tool

Module 3: Resolve Software Failure

This module explains how to fix problems with applications that have problems after being installed.

Lessons

- Overview
- Event Viewer
- Event Forwarding
- Application Compatibility Toolkit
- Windows Troubleshooting Platform
- Windows Experience Index
- Testing Compatibility with Safe Mode
- System Restore
- Resolve Software Failure
- Review
Lab: Resolve Software Failure

- Install applications written for older versions of Windows
- Use the Program Compatibility Tool to configure settings for older applications
- Use PowerShell scripts to configure Network Adapters
- Use the Troubleshooter to enable the network adapter
- Install Windows 7 SDK
- Create a Troubleshooting Pack with the SDK
- Configure Event Forwarding
- Use System Restore

After completing this module, students will be able to:

- Configure Event Forwarding
- Use System Restore to fix desktop problems.
- Create a Windows 7 Troubleshooter

Module 4: Identify and Resolve Logon Issues

This module explains how to fix logon problems and configure local and roaming logon profiles.

Lessons

- Overview
- Authentication Process
- Machine Accounts
- Trust Relationships
- Network Services
- User Account Properties
- User Profiles
- Resolve Logon Issues
- Review

Lab: Identify and Resolve Logon Issues

- Join a computer to the domain
- Install Remote Server Administration Tools (RSAT)

Module 5: Identify and Resolve Network Connectivity Issues

This module explains how to troubleshoot connectivity and network problems for client computers.

Lessons

- Overview
- Scope of the Problem
- Hardware Issues
- TCP/IP Configuration
- Network Routing
- IPSec Configuration
- Network Connectivity Tools
- Branch Cache
- Resolve Network Connectivity Issues
- Review

Lab: Identify and Resolve Network Connectivity Issues

- Use command-line tools to identify and fix network connectivity problems
- Fix connectivity problems caused by problem scripts

After completing this module, students will be able to:

- Create Roaming and Mandatory User Profiles
- Configure Machine Accounts in Active Directory
- Configure User Account Properties in Active Directory
Module 6: Identify and Resolve Name Resolution Issues

This module explains how to use network services and local computer files to resolve computer names.

Lessons
- Overview
- DNS Name Resolution
- Using a Hosts file
- WINS Configuration
- Using LMHOSTS files
- Name Resolution Order
- Manual vs DHCP Configuration
- Resolve Name Resolution Issues
- Review

Lab: Identify and Resolve Name Resolution Issues

- Configure and Test DNS Resolution
- Configure and Test Hosts File Resolution
- Configure and Test NetBIOS Resolution

After completing this module, students will be able to:
- Configure records on a DNS Server
- Configure HOSTS records
- Using command-line and scripting tools to configure TCP/IP settings

Module 7: Identify and Resolve Network Printer Issues

This module explains how to configure printer settings and security.

Lessons
- Overview
- Connecting to a Network Printer
- Managing the Print Spooler
- Setting Printer Priorities
- Creating Printer Pools
- Configuring Drivers
- Printer Schedules
- Printer Permissions
- Manage Printers with Group Policy Settings
- Resolve Network Printer Issues
- Review

Lab: Identify and Resolve Network Printer Issues

- Install local and network printers
- Create and use a separator page
- Configure Printer Redirection and Printer Pooling
- Move the Print Spooler Directory

After completing this module, students will be able to:
- Optimize the performance of the Print Spooler
- Redirect Print Jobs from non-functioning Printers
- Manage Active Directory registration of Printers
- Manage Printer Permissions

Module 8: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons
- Use command-line tools to troubleshoot connectivity problems.
- Use the Windows Troubleshooters to fix configuration issues.
- Configure Advanced TCP/IP options on a client computer

This module explains how to configure printer settings and security.

Lessons
- Overview
- Connecting to a Network Printer
- Managing the Print Spooler
- Setting Printer Priorities
- Creating Printer Pools
- Configuring Drivers
- Printer Schedules
- Printer Permissions
- Manage Printers with Group Policy Settings
- Resolve Network Printer Issues
- Review

Lab: Identify and Resolve Network Printer Issues

- Install local and network printers
- Create and use a separator page
- Configure Printer Redirection and Printer Pooling
- Move the Print Spooler Directory

After completing this module, students will be able to:
- Optimize the performance of the Print Spooler
- Redirect Print Jobs from non-functioning Printers
- Manage Active Directory registration of Printers
- Manage Printer Permissions
### Module 7: Identify and Resolve Performance Issues

- Overview
- Analyzing Event Logs
- Setting Power Management
- Optimize Processor Usage
- Optimizing Memory Usage
- Optimize Hard Drive Usage
- Optimize Network Usage
- Performance Tools
- Resolve Performance Issues
- Review

**Lab: Identify and Resolve Performance Issues**

- Schedule and Perform a Disk Defragmentation
- Using Task Manager
- Using Resource Monitor
- Display a message when a Service stops

After completing this module, students will be able to:

- Configure automatic responses to Service failure
- Manage the use of Processing resources by applications
- View and control active connections to a computer
- Optimize Hard-Disk performance.

### Module 9: Identify and Resolve Hardware Failure Issues

This module explains how to diagnose hardware problems on a computer.

**Lessons**

- Overview
- Diagnosing Memory Failure Issues
- Hard Drive Issues
- Network Card Issues
- Power Supply Issues

**Windows Hardware Diagnostic Tools**

- Windows Hardware Diagnostic Tools
- Resolve Hardware Failure Issues
- Review

**Lab: Identify and Resolve Hardware Failure Issues**

- Use the Windows Memory Diagnostics Tool
- Fix Hard Disk Errors
- Use the Reliability Monitor
- Use Event Viewer to Find Hardware Information

After completing this module, students will be able to:

- Understand how to be proactive in dealing with hardware problems
- Use Windows 7 hardware diagnostic tools

### Module 10: Identify and Resolve Wireless Connectivity Issues

This module explains how to configure reliable and secure wireless connectivity for client computers.

**Lessons**

- Overview
- Signal Strength
- Wireless Security
- Wireless Profiles
- Management Options for Wireless Devices
- Resolve Wireless Connectivity Issues
- Review

**Lab: Identify and Resolve Wireless Connectivity Issues**

- No Lab Exercises

After completing this module, students will be able to:

- Understand the encryption options available
### Module 11: Identify and Resolve Remote Access Issues

This module explains how to configure remote network connections for client computers.

**Lessons**

- Overview
- Remote Access Methods
- Dial-up Configuration
- VPN Configuration
- DirectAccess Configuration
- Authentication Protocols
- Resolve Remote Access Issues
- Review

**Lab: Identify and Resolve Remote Access Issues**

- Configure Remote Access settings for a domain user account
- Create and Test a VPN Connection

After completing this module, students will be able to:

- Understand the security options available when creating remote access connections
- Understand the new capabilities of VPN connections that use DirectAccess
- Resolve connectivity problems for VPN and Dial-Up connections

### Module 12: Manage File Synchronization

This module explains how to allow end-users to work with network files that are being synchronized on their local desktops or laptops.

**Lessons**

- Overview
- Configuring Offline File Access
- Synchronization Settings
- Transparent Caching
- Roaming Profiles
- Restoring Network Files
- Resolve File Synchronization Problems
- Review

**Lab: Manage File Synchronization**

- Configure and Test Offline Files
- Restore the Previous Version of a File

After completing this module, students will be able to:

- Configure Transparent Caching
- Restore deleted network files

### Module 13: Identify and Resolve Internet Explorer Security Issues

This module explains how to configure the security features in Internet Explorer to protect user information and privacy.

**Lessons**

- Overview
- Configure Security Zone
- Configure Security Levels
- Configure Privacy Settings
- Managing Add-ons
- Configure Smart Screen Filter
- Other Security Issues
- Resolve Internet Explorer Security Issues
- Review

**Lab: Identify and Resolve Internet Explorer Security Issues**

- Configure Trusted Security Zone
Module 14: Identify and Resolve Firewall Issues

This module explains how to configure Windows Firewall to secure network traffic and applications on a computer.

Lessons

- Overview
- Securing Network Applications and Features
- Program and Port Exceptions
- Configuring Notifications and Logging
- Network Security Tools
- Resolve Firewall Issues
- Review

Lab: Identify and Resolve Firewall Issues

- Configure and Test Firewall Rules for an application
- Fix Application Problems Caused by Firewall Rules

After completing this module, students will be able to:

- Block applications from communicating over the network

Module 15: Identify and Resolve Issues Due To Malicious Software

This module explains how to restore a computer system after an attack by viruses or other malicious software.

Lessons

- Overview
- Proactive Malware Protection
- Protecting Internet Explorer
- Windows and Anti-Virus Updates
- Recovering From Malware Infection
- Resolve Issues Due To Malicious Software
- Review

Lab: Identify and Resolve Issues Due To Malicious Software

- Use the Action Center to manage UAC settings
- Use System File Checker
- Use the Malicious Software Removal Tool
- Install Microsoft Security Essentials

After completing this module, students will be able to:

- Identify problems caused by viruses and other malware.
- How to protect Internet Explorer and E-mail applications from malware attack
- How to prevent data loss and fix a computer after a malware attack
- Install and configure Microsoft Security Essentials
Module 16: Identify and Resolve Encryption Issues

This module explains how to fix problems caused by using encryption on a Windows computer.

Lessons

- Overview
- Configuring a Recovery Agent
- Using EFS
- Using BitLocker
- Encryption Tools
- Resolve Encryption Issues
- Review

Lab: Identify and Resolve Encryption Issues

- Encrypt Files using EFS
- Configure EFS Sharing
- Configure a Recovery Agent

After completing this module, students will be able to:

- Recover from lost encryption keys
- How to encrypt individual files using EFS
- Use BitLocker to protect laptops and insecure computers

Module 17: Identify and Resolve Software Update Issues

This module explains how to enable and use the software update features available in Windows 7.

Lessons

- Overview
- Types of Windows Updates
- Using Windows Update
- Using Microsoft Update
- Resolve Software Update Issues
- Review

Lab: Identify and Resolve Software Update Issues

- Configure Windows Updates using desktop settings
- Configure Windows Updates using Group Policy settings

After completing this module, students will be able to:

- Configure client computers to get updates from the local network instead of the Internet
- Understand the different options available when updating the operating system
- Understand how to configure automatic updates for Microsoft applications
About this Course

This five-day instructor-led course provides students with the knowledge and skills needed to isolate, document and resolve problems on a Windows 7 desktop or laptop computer. It will also help test takers prepare for the 70-685 and 70-682 exams.

Audience Profile

This course is intended for Windows 7 desktop support technicians who resolve Tier 1 and 2 problems on desktop computers. A minimum of three years of experience configuring and supporting desktop or laptop operating systems is recommended.

At Course Completion

After completing this course, students will be able to:

- Identify and Resolve Desktop Application Issues
- Identify the Cause of and Resolve Networking Issues
- Manage and Maintain Systems That Run Windows 7
- Support Mobile Users
- Identify the Cause of and Resolve Security Issues

Prerequisites

Before attending this course, students must have:
- TCP/IP Troubleshooting skills
- Experience working in a domain environment
- Experience using desktop and command-line troubleshooting tools
- Experience installing and troubleshooting desktop application problems
- Experience configuring registry and group policy settings

Course Outline

Module 1: Identify and Resolve New Software Installation Issues

This module explains how to fix problems that occur during the installation of new software.

Lessons

- Overview
COURSE OUTLINE

• Planning New Software Deployment
• Multilingual Deployment
• Using Group Policy to install software
• Using Software Restriction Policies
• Digitally Signing Software
• Using WMI
• Using Applocker
• Using Virtualization for Testing
• Resolve Software Installation Issues
• Review

Lab : Identify and Resolve New Software Installation Issues

• Create a Repair Disk and Installation Partitions
• Install and Configure Windows 7
• Install Programs and test Applocker
• Configure Compatibility Settings

After completing this module, students will be able to:

• Understand the different installation options for Windows 7
• Understand the different installation options for Windows 7 applications
• Resolve Windows 7 installation problems
• Prevent users from running unapproved applications

Module 2: Resolve Software Configuration Issues

This module explains how to fix application install problems caused by older programs or new features and options.

Lessons

• Overview
• Change Default Settings on the Image
• Enable and Disable Features
• Pointing to a Network Resource
• Configuring Updates

• Resolve Configuration Issues with Group Policy
• Driver Updates
• Problem Steps Recorder
• Resolve Software Configuration Issues
• Review

Lab : Resolve Software Configuration Issues

• Install the Windows Automated Installation Kit
• Create a Windows PE bootable image
• Create a VHD disk
• Install Windows 7 on a VHD
• Boot Windows 7 from a VHD
• Use the Problem Steps Recorder

After completing this module, students will be able to:

• Create a Windows 7 VHD disk
• Configure operating system features
• Understand the impact of Driver Updates
• Fix software configuration problems
• Use the Problem Steps Recorder tool

Module 3: Resolve Software Failure

This module explains how to fix problems with applications that have problems after being installed.

Lessons

• Overview
• Event Viewer
• Event Forwarding
• Application Compatibility Toolkit
• Windows Troubleshooting Platform
• Windows Experience Index
• Testing Compatibility with Safe Mode
• System Restore
• Resolve Software Failure
• Review
Lab : Resolve Software Failure

- Install applications written for older versions of Windows
- Use the Program Compatibility Tool to configure settings for older applications
- Use PowerShell scripts to configure Network Adapters
- Use the Troubleshooter to enable the network adapter
- Install Windows 7 SDK
- Create a Troubleshooting Pack with the SDK
- Configure Event Forwarding
- Use System Restore

After completing this module, students will be able to:

- Configure Event Forwarding
- Use System Restore to fix desktop problems.
- Create a Windows 7 Troubleshooter

Module 4: Identify and Resolve Logon Issues

This module explains how to fix logon problems and configure local and roaming logon profiles.

Lessons

- Overview
- Authentication Process
- Machine Accounts
- Trust Relationships
- Network Services
- User Account Properties
- User Profiles
- Resolve Logon Issues
- Review

Lab : Identify and Resolve Logon Issues

- Join a computer to the domain
- Install Remote Server Administration Tools (RSAT)

Module 5: Identify and Resolve Network Connectivity Issues

This module explains how to troubleshoot connectivity and network problems for client computers.

Lessons

- Overview
- Scope of the Problem
- Hardware Issues
- TCP/IP Configuration
- Network Routing
- IPSec Configuration
- Network Connectivity Tools
- Branch Cache
- Resolve Network Connectivity Issues
- Review

Lab : Identify and Resolve Network Connectivity Issues

- Use command-line tools to identify and fix network connectivity problems
- Fix connectivity problems caused by problem scripts

After completing this module, students will be able to:

- Create Roaming and Mandatory User Profiles
- Configure Machine Accounts in Active Directory
- Configure User Account Properties in Active Directory
to:

• Use command-line tools to troubleshoot connectivity problems.
• Use the Windows Troubleshooters to fix configuration issues.
• Configure Advanced TCP/IP options on a client computer

Module 6: Identify and Resolve Name Resolution Issues

This module explains how to use network services and local computer files to resolve computer names.

Lessons

• Overview
• DNS Name Resolution
• Using a Hosts files
• WINS Configuration
• Using LMHOSTS files
• Name Resolution Order
• Manual vs DHCP Configuration
• Resolve Name Resolution Issues
• Review

Lab: Identify and Resolve Name Resolution Issues

• Configure and Test DNS Resolution
• Configure and Test Hosts File Resolution
• Configure and Test NetBIOS Resolution

After completing this module, students will be able to:

• Configure records on a DNS Server
• Configure HOSTS records
• Using command-line and scripting tools to configure TCP/IP settings

Module 7: Identify and Resolve Network Printer Issues

This module explains how to configure printer settings and security.

Lessons

• Overview
• Connecting to a Network Printer
• Managing the Print Spooler
• Setting Printer Priorities
• Creating Printer Pools
• Configuring Drivers
• Printer Schedules
• Printer Permissions
• Manage Printers with Group Policy Settings
• Resolve Network Printer Issues
• Review

Lab: Identify and Resolve Network Printer Issues

• Install local and network printers
• Create and use a separator page
• Configure Printer Redirection and Printer Pooling
• Move the Print Spooler Directory

After completing this module, students will be able to:

• Optimize the performance of the Print Spooler
• Redirect Print Jobs from non-functioning Printers
• Manage Active Directory registration of Printers
• Manage Printer Permissions

Module 8: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons

• Monitor system performance
• Configure system settings
• Optimize system performance
• Troubleshoot performance issues

After completing this module, students will be able to:

• Increase system performance
• Troubleshoot performance issues
• Optimize system resources
• Monitor system performance

Module 9: Identify and Resolve Security Issues

This module explains how to enhance system security and protect data.

Lessons

• Identify security threats
• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities

After completing this module, students will be able to:

• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities
• Protect system data

Module 10: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons

• Monitor system performance
• Configure system settings
• Optimize system performance
• Troubleshoot performance issues

After completing this module, students will be able to:

• Increase system performance
• Troubleshoot performance issues
• Optimize system resources
• Monitor system performance

Module 11: Identify and Resolve Security Issues

This module explains how to enhance system security and protect data.

Lessons

• Identify security threats
• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities

After completing this module, students will be able to:

• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities
• Protect system data

Module 12: Identify and Resolve Performance Issues

This module explains how to improve the performance of a system by monitoring and controlling the use of resources by applications.

Lessons

• Monitor system performance
• Configure system settings
• Optimize system performance
• Troubleshoot performance issues

After completing this module, students will be able to:

• Increase system performance
• Troubleshoot performance issues
• Optimize system resources
• Monitor system performance

Module 13: Identify and Resolve Security Issues

This module explains how to enhance system security and protect data.

Lessons

• Identify security threats
• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities

After completing this module, students will be able to:

• Configure security settings
• Implement security best practices
• Monitor security vulnerabilities
• Protect system data
COURSE OUTLINE

Module 9: Identify and Resolve Hardware Failure Issues

This module explains how to diagnose hardware problems on a computer.

Lessons

- Overview
- Diagnosing Memory Failure Issues
- Hard Drive Issues
- Network Card Issues
- Power Supply Issues
- Windows Hardware Diagnostic Tools
- Resolve Hardware Failure Issues
- Review

Lab: Identify and Resolve Hardware Failure Issues

- Use the Windows Memory Diagnostics Tool
- Fix Hard Disk Errors
- Use the Reliability Monitor
- Use Event Viewer to Find Hardware Information

After completing this module, students will be able to:

- Understand how to be proactive in dealing with hardware problems
- Use Windows 7 hardware diagnostic tools

Module 10: Identify and Resolve Wireless Connectivity Issues

This module explains how to configure reliable and secure wireless connectivity for client computers.

Lessons

- Overview
- Signal Strength
- Wireless Security
- Wireless Profiles
- Management Options for Wireless Devices
- Resolve Wireless Connectivity Issues
- Review

Lab: Identify and Resolve Wireless Connectivity Issues

- No Lab Exercises

After completing this module, students will be able to:

- Understand the encryption options available
Module 11: Identify and Resolve Remote Access Issues

This module explains how to configure remote network connections for client computers.

Lessons

- Overview
- Remote Access Methods
- Dial-up Configuration
- VPN Configuration
- DirectAccess Configuration
- Authentication Protocols
- Resolve Remote Access Issues
- Review

Lab: Identify and Resolve Remote Access Issues

- Configure Remote Access settings for a domain user account
- Create and Test a VPN Connection

After completing this module, students will be able to:

- Understand the security options available when creating remote access connections
- Understand the new capabilities of VPN connections that use DirectAccess
- Resolve connectivity problems for VPN and Dial-Up connections

Module 12: Manage File Synchronization

This module explains how to allow end-users to work with network files that are being synchronized on their local desktops or laptops.

Lessons

- Overview
- Configuring Offline File Access
- Synchronization Settings
- Transparent Caching
- Roaming Profiles
- Restoring Network Files
- Resolve File Synchronization Problems
- Review

Lab: Manage File Synchronization

- Configure and Test Offline Files
- Restore the Previous Version of a File

After completing this module, students will be able to:

- Configure Transparent Caching
- Restore deleted network files

Module 13: Identify and Resolve Internet Explorer Security Issues

This module explains how to configure the security features in Internet Explorer to protect user information and privacy.

Lessons

- Overview
- Configure Security Zone
- Configure Security Levels
- Configure Privacy Settings
- Managing Add-ons
- Configure Smart Screen Filter
- Other Security Issues
- Resolve Internet Explorer Security Issues
- Review

Lab: Identify and Resolve Internet Explorer Security Issues

- Configure Trusted Security Zone
Module 14: Identify and Resolve Firewall Issues

This module explains how to configure Windows Firewall to secure network traffic and applications on a computer.

Lessons

- Overview
- Securing Network Applications and Features
- Program and Port Exceptions
- Configuring Notifications and Logging
- Network Security Tools
- Resolve Firewall Issues
- Review

Lab: Identify and Resolve Firewall Issues

- Configure and Test Firewall Rules for an application
- Fix Application Problems Caused by Firewall Rules

After completing this module, students will be able to:

- Block applications from communicating over the network
- Record and setup notifications of unapproved network communication
- Fix problems caused by improper configuration of Windows Firewall

Module 15: Identify and Resolve Issues Due To Malicious Software

This module explains how to restore a computer system after an attack by viruses or other malicious software.

Lessons

- Overview
- Proactive Malware Protection
- Protecting Internet Explorer
- Windows and Anti-Virus Updates
- Recovering From Malware Infection
- Resolve Issues Due To Malicious Software
- Review

Lab: Identify and Resolve Issues Due To Malicious Software

- Use the Action Center to manage UAC settings
- Use System File Checker
- Use the Malicious Software Removal Tool
- Install Microsoft Security Essentials

After completing this module, students will be able to:

- Identify problems caused by viruses and other malware.
- How to protect Internet Explorer and E-mail applications from malware attack
- How to prevent data loss and fix a computer after a malware attack
- Install and configure Microsoft Security Essentials
Module 16: Identify and Resolve Encryption Issues

This module explains how to fix problems caused by using encryption on a Windows computer.

Lessons

• Overview
• Configuring a Recovery Agent
• Using EFS
• Using BitLocker
• Encryption Tools
• Resolve Encryption Issues
• Review

Lab: Identify and Resolve Encryption Issues

• Encrypt Files using EFS
• Configure EFS Sharing
• Configure a Recovery Agent

After completing this module, students will be able to:

• Recover from lost encryption keys
• How to encrypt individual files using EFS
• Use BitLocker to protect laptops and insecure computers

Module 17: Identify and Resolve Software Update Issues

This module explains how to enable and use the software update features available in Windows 7.

Lessons

• Overview
• Types of Windows Updates
• Using Windows Update
• Using Microsoft Update
• Resolve Software Update Issues
• Review

Lab: Identify and Resolve Software Update Issues

• Configure Windows Updates using desktop settings
• Configure Windows Updates using Group Policy settings

After completing this module, students will be able to:

• Configure client computers to get updates from the local network instead of the Internet
• Understand the different options available when updating the operating system
• Understand how to configure automatic updates for Microsoft applications
Microsoft SharePoint Server 2010 for the Site Owner/Power User

Course#: MS 50470

Length: 2 Days
Audience: IT Professionals
Technology: Microsoft SharePoint Server 2010
Type: Hands-On Course
Delivery Method: Instructor-led Classroom

About this Course

This two-day instructor-led course is designed for the site owner/”power user” of a SharePoint site who needs to know how to create sites and lists, manage user access and customize lists and pages. This class uses the SharePoint Server 2010 version of SharePoint. While it is of equal value for users of SharePoint Foundation, it does include a few features not found in Foundation.

Audience Profile

This course is designed for the site owner/ “power user” of a SharePoint site, who needs to know how to create sites and lists, manage user access and customize lists and pages.

At Course Completion

After completing this course, students will be able to:

- Manage Sites and Site Collections.
- Add users and groups and manage site, list, folder and item security.
- Add and configure web parts.
- Configure sites; include themes, title, description and icon.
- Configure site navigation.
- View site activity reports.
- Customize lists and libraries.
- Work with Site Columns and Site Content Types.
- Create Forms libraries.
- Configure Check out/in, Content Approval and Versioning.
- Create and modify pages and web part pages.

Prerequisites

Before attending this course, students must have:

- Working knowledge of SharePoint 2010 and know how to navigate a SharePoint site and SharePoint lists.
## Course Outline

### Module 1: The Role of the Site Owner

**Lessons**
- The role of the site owner / power user
- The tools for the site owner

### Module 2: SharePoint Review

**Lessons**
- A review of SharePoint basics

### Module 3: Using and Customizing Lists

**Lessons**
- List Settings
- Customizing Columns
- Site Columns
- Content Types
- Creating Lists by Importing Excel Files
- Creating and Modifying Views
- Content Types
- Communications Options
- Overview of Workflows

### Module 4: Creating Forms Libraries

**Lessons**
- Creating Forms Libraries from InfoPath

### Module 5: Creating Web Pages

**Lessons**
- Creating Web Pages
- Creating Web Part Pages

### Module 6: Sites and Workspaces

**Lessons**
- Site Customization
- Site Navigation
- Web Parts

### Module 7: Users and Groups

**Lessons**
- Users and Groups
- Permissions
- Adding users
- Adding Site Collection Administrators
- Reviewing permissions
- Sending E-mail to site users
- List and Library Permissions
- Creating Groups
- Creating Custom Permission Levels
- Audiences
- Managing User Alerts

### Module 8: Activity

**Lessons**
- Site Web Analytics Reports
- Site Collection Web Analytics Reports
Microsoft SharePoint 2010 Site Collection and Site Administration
Course#: MS50547

Length: 5 Days
Audience: IT Professionals
Technology: Microsoft SharePoint
Type: Hands-On course
Delivery Method: Instructor-led Classroom

About this Course
This five-day instructor-led Site Collection and Site Administrator course gives students who have SharePoint 2010 Owner permissions for a site the ability to manage, administer and modify a SharePoint 2010 site based on business needs and objectives. This course also provides the IT Business Analyst the necessary information to advise business units on which features are a best fit for their business processes. The course will provide students necessary information on SharePoint 2010 features and capabilities including how to implement and Best Practices for implementing the feature. The course will also focus on different aspects of Governance, Office 2010 integration, workflows, web parts and much more, helping students to understand the depth and breadth of SharePoint 2010.

Audience Profile
This course is intended for SharePoint Administrators, SharePoint Developers, Site Collection, Site Administrators and SharePoint Power Users who are tasked with working within the SharePoint environment.

At Course Completion
After completing this course, students will be able to:

- Create and modify SharePoint 2010 objects.
- Understand SharePoint 2010 governance at the site collection and site levels.
- Understand SharePoint 2010 planning principals.
- Understand Office 2010 and SharePoint 2010 integration.
- Modify SharePoint 2010 to improve the built-in search.

Prerequisites
This course requires that you meet the following prerequisites:

- At least 2 years’ experience of working with relational databases, including:
  - Designing a normalized database.
  - Creating tables and relationships.
  - Querying with Transact-SQL.
  - Some basic knowledge of data warehouse schema topology (including star and snowflake schemas).
  - Some exposure to basic programming constructs (such as looping and branching).
  - An awareness of key business priorities such as revenue, profitability, and financial accounting is desirable.
## Module 1: SharePoint 2010 General Overview
The SharePoint 2010 family of tools has expanded to include a wider variety of functionality that offers organizations a streamlined process and central location for document management, collaboration and information management. Module 1 provides an overview of the versions and functionalities. It also explains the site collection and site administrator roles.

**Lessons**
- SharePoint 2010 Site Collection and Site Administrator Roles
- SharePoint 2010 Wheel
- Comparing SharePoint 2010 Versions
- Expanded Browser Capabilities

After completing this module, students will be able to:
- Understand the role of the SharePoint 2010 Site Collection and Site Administrator.
- Understand the SharePoint 2010 Wheel.
- Understand the differences between SharePoint Foundations 2010 and SharePoint 2010.
- Understand the expanded browser capabilities.

## Module 2: SharePoint 2010 Environment – Getting Started
This module will cover basic information for Site Collection and Site Administrators. Having a basic set of terminology and getting the “lay of the land” will help to understand the rest of the course.

**Lessons**
- SharePoint 2010 Environment
- Navigation
- SharePoint 2010 Ribbon
- Adding and Editing Content in SharePoint 2010
- Using Your Name Menu

## Module 3: Organization and Development of SharePoint 2010 Sites
For organizations that are implementing or continuing to improve SharePoint 2010, the majority of the work is not found in the day-to-day activities of creating and managing SharePoint 2010 objects. It falls within the realm of governance and establishing best practices for how SharePoint 2010 is used within the organization. Without establishing these principals within the organization, SharePoint 2010 will fail.

**Lessons**
- Governance and Best Practices
- Information Architecture
- Site Structure
- User Education
- Resources

After completing this module, students will be able to:
- Understand Governance and Best Practices within SharePoint 2010.
- Understand Information Architecture.
- Understand how site structure can help within SharePoint 2010.
- Understand how user education can help with SharePoint 2010.

## Module 4: Site Collections, Top Level Sites and Sites
After completing this module, students will be able to:
- Navigate around SharePoint 2010.
- Be able to use the SharePoint 2010 Ribbon.
- Be able to add and edit basic content within SharePoint 2010.
- Use the Your Name Menu.
The first major milestone after Governance is the creation of sites within a site collection. Understanding the types of sites available within SharePoint 2010, as well as the process of creating and understanding navigation, is the foundation for site collection and site managers.

Lessons

- Overview of SharePoint 2010 Hierarchy
- SharePoint 2010 Site Inventory
- Creating Sites and Subsites
- Modifying Site Navigation
- Specialty Sites
- Sites and Navigation Best Practices

Lab : Site Collections, Top Level Sites and Sites

- Exercise 1: Create a New Top Level Site
- Exercise 2: Create New Sub-Sites called New and Current Projects and Sales
- Exercise 3: Configure Navigation between the Learning Lake Site
- Exercise 4: Create a Records Center
- Exercise 5: Create a Projects Web Database site for Sales
- Exercise 6: Create and Configure a Visio Process Repository
- Exercise 7: Create a Document Workspace

After completing this module, students will be able to:

- Understand the different types of SharePoint 2010 sites available.
- Know how to create SharePoint 2010 sites.
- Know how to modify site navigation.

Module 5: Creating and Modifying Libraries and Lists

Most of the administrating within SharePoint 2010 is done at the list or library level. This module will dig deeper into both lists and libraries and will help organizations determine what works best for a given situation.

Lessons

- Overview of Libraries
- Creating a Library in SharePoint 2010
- Library Inventory
- Overview of Lists
- Creating a List in SharePoint 2010
- List Inventory
- Library and List Best Practices

Lab : Creating and Modifying Libraries and Lists

- Exercise 1: Create a Custom List
- Exercise 2: Create a New Product Survey
- Exercise 3: Create a List from Excel
- Exercise 4: Create a Document Library
- Exercise 5: Create an Asset Library
- Exercise 6: Create a Wiki Page Library

After completing this module, students will be able to:

- Understand the purpose of lists and libraries.
- Understand the differences between the different lists and libraries.
- Create a list or library using multiple methods.
- Customize a list form using InfoPath 2010.

Module 6: Managing Permissions for Users and Groups

This module will explain how permissions work within a site collection and the tools within SharePoint 2010 that are used to manage and maintain them. Being able to create and manage permissions within SharePoint 2010 is one of the more crucial elements that SharePoint 2010 Site Collection and Site Administrators need to know.

Lessons

- Overview of Permissions and Security in SharePoint 2010
- Permissions within SharePoint 2010
- Managing Permissions within SharePoint 2010
- Stop Inheriting Permissions
- Creating a New SharePoint 2010 Group
- Managing Users and Groups
- Other Permissions Management Tools
Module 7: Site/Content Management and Collaboration

When a new site is created, the site administrators will need to decide how content is managed within the site. They will also need to consider how sites flow between each other, how information is portrayed, especially at the Welcome Page level, and how content is managed within the site.

Lessons

- Overview of Site and Content Management
- Content Management
- Records Management with the Records Center
- Setting up Alerts and Real Simple Syndication
- Targeting Audiences with Content
- Site and Content Management Best Practices

Lab: Site and Content Management

- Exercise 1: Modify the Current Welcome Page
- Exercise 2: Enable Content Management
- Exercise 3: Enable Content Rating

Module 8: Office 2010 Integration with SharePoint 2010

The heavy integration of Microsoft Office 2010 is one of the main benefits of using SharePoint 2010. There are a myriad of ways to connect SharePoint 2010 to Microsoft Office 2010, whether it is connecting a SharePoint 2010 document library to Microsoft Outlook, linking an Access database or an Excel spreadsheet to a list in SharePoint 2010, using Microsoft InfoPath to build SharePoint 2010 lists, publishing a Visio diagram to be displayed in the web, or managing Microsoft PowerPoint slides in a SharePoint 2010 slide library.

Since a majority of SharePoint 2010 users work out of Outlook most of the day, this integration with SharePoint 2010 helps to focus activities in one or two locations instead of four or five locations. All of these options provide significant improvements over using the products on their own. This module will cover the different ways in which SharePoint 2010 and the Office 2010 Suite work together to expose the full functionality of the products.

Lessons

- Overview of Office 2010 and Office Web App
- Collaborating Using Outlook 2010
- Connecting and Collaborating with Office 2010 Backstage
• Connecting, Managing and Editing Documents  
• Collaborating with PowerPoint 2010  
• Take Information Offline with SharePoint Workspace 2010  
• Integration of Visio 2010  
• Integration of Access 2010  
• Using InfoPath 2010 with SharePoint 2010  
• Office 2010 Integration Best Practices

Lab : Office 2010 Integration with SharePoint 2010
• Exercise 1: Connect Outlook 2010 with SharePoint 2010  
• Exercise 2: Collaborate with PowerPoint 2010  
• Exercise 3: Connect Visio 2010 to Visio Process Repository  
• Exercise 4: Working with Information Offline with Workspace 2010

After completing this module, students will be able to:
• Understand the integration features between Office 2010 and SharePoint 2010.  
• Understand how Office Web Apps works between the two products.  
• Understand the collaboration features available with Outlook 2010.  
• Understand how Excel and Word interact with SharePoint 2010.  
• Understand how PowerPoint can expand collaboration and presentations.  
• Understand how SharePoint 2010 can be taken offline with Workspace 2010.  
• Understand the integration of Visio and Access with SharePoint 2010.  
• Have a basic understanding of how InfoPath 2010 works with SharePoint 2010.

Module 9: Creating Consistency Across Sites
When developing SharePoint 2010, it is necessary to create a consistent feel across sites within the site collection. This objective fits in to the Governance aspects of Module 3: Organization and Development of SharePoint 2010 Sites.

Lessons
• Site Columns  
• Site Content Types  
• Implementing Document Sets  
• Show/Hide the Server Ribbon  
• SharePoint Site Themes  
• Overview of SharePoint Templates  
• Managing Through Site Templates  
• Managing Through List and Library Templates  
• Page Layout and Site Template Settings  
• Consistency Best Practices

Lab : Creating Consistency Across Sites
• Exercise 1: Modify the SharePoint 2010 Site Theme  
• Exercise 2: Create a Site Content Type  
• Exercise 3: Create Document Set for Learning Lake  
• Exercise 4: Create a Site Template  
• Exercise 5: Create a List and Libraries Template  
• Exercise 6: Designate a Specific Page Layout and Site Templates

After completing this module, students will be able to:
• Understand and use Site Content Types and Columns.  
• Understand and Implement Document Sets.  
• Implement and Customize SharePoint Site Themes.

Module 10: Finding Information Using Search and Views
One common complaint within organizations is the difficulty finding documents in a timely manner. Many hours are wasted searching for a specific document. This module will show methods for searching and configuring views in order to assist SharePoint 2010 users in finding what they need in much less time.
Lessons

- Overview of Views
- Adding Columns to Lists and Libraries
- Creating Views in Lists and Libraries
- Configuring Per-Location View
- Overview of Metadata and Taxonomy for SharePoint 2010
- Implementing Managed Metadata
- Overview of Search
- Implementing Managed Keywords and Best Bets
- Using SharePoint Search
- Configuring Search Scope
- Configuring Search Visibility
- View and Search Best Practices

Lab: Finding Information Using Search and Views

- Exercise 1: Use Sorting and Grouping to Modify a View
- Exercise 2: Create a New View for Project Documents
- Exercise 3: Create Calendar and Gantt Chart Views
- Exercise 4: Create and Implement Managed Keywords and Best Bets
- Exercise 5: Optimize Project Documents for Search
- Exercise 6: Test Search to Find Information

Module 11: Displaying Data with Web Parts in SharePoint 2010

- Understanding the different types of Web Parts.
- Understanding how to display Web Parts within a SharePoint 2010 page.
- Understand basic properties used to configure Web Parts.
- Understand how to maintain Web Parts.
Module 12: Document Management through Workflows
An integral part of SharePoint 2010 for document and information management is the ability to configure Workflows. By default, SharePoint 2010 comes with built-in Workflows to help organizations in a variety of different ways, including; approving a new item or document, collecting feedback from multiple users, or disposing of documents based on compliance policies.

Lessons
- Overview of SharePoint 2010 Workflows
- Approval - SharePoint 2010 Workflow
- Three-State Workflow
- Collect Feedback - SharePoint 2010 Workflow
- Collect Signatures - SharePoint 2010 Workflow
- Disposition Workflow
- Managing Workflows in SharePoint 2010

Lab: Document Management through SharePoint 2010 Workflows
- Exercise 1: Create a Workflow to Approve New Projects
- Exercise 2: Create a Feedback Workflow
- Exercise 3: Create a Disposition Approval Workflow

After completing this module, students will be able to:
- Understand Workflows within SharePoint 2010.
- Implement and Configure the Approval – SharePoint 2010 Workflow.
- Implement and Configure the Three-State Workflow.
- Implement and Configure the Collect Feedback – SharePoint 2010 Workflow.
- Implement and Configure the Collect Signatures – SharePoint 2010 Workflow.
- Implement and Configure the Disposition Workflow.
- Understand how to Manage Workflows after created.

Module 13: SharePoint 2010 Social Computing and Collaboration
An important advancement within SharePoint 2010 is the inclusion of Social Computing concepts. Many organizations have similar challenges when working with internal talent management, also known as knowledge management. One common challenge is finding an individual with the specific skills and knowledge needed to complete a task or project. SharePoint 2010 offers a viable platform to help organizations with talent or knowledge management.

Lessons
- Overview of Social Computing
- Using My Sites for Knowledge Management
- Configuring My Profile
- Using Social Tags and Note Boards
- SharePoint 2010 My Site Blog
- SharePoint 2010 Social Computing Best Practices

After completing this module, students will be able to:
- Understand the different components of SharePoint 2010 My Sites.
- Understand how to configure SharePoint 2010 My Profile.
- Understand how Social Tags and Note Boards are integrated into SharePoint 2010.
- Understand how to implement and configure My Site Blogs.

Module 14: Administrating a SharePoint 2010 Site Collection and Site
This module covers SharePoint 2010 topics that Site Collection or Site administrators will work with as part of their day to day activities.

Lessons
• Overview of Administrating of SharePoint 2010
• Additional Settings for Site Administration
• Additional Settings for Site Collection Administration

After completing this module, students will be able to:

• Understand Governance for Site Administration.
• Understand additional settings available for Site Administrators.
• Understand additional settings available for Site Collection Administrators.
components of an Online Analytical Processing (OLAP) cube.
Lessons
- Introduction to Multidimensional Analysis
- Creating Data Sources and Data Source Views
- Creating a Cube
- Overview of Cube Security

Lab: Creating a Multidimensional Database
- Creating a Data Source
- Creating and Modifying a Data Source View
- Creating and Modifying a Cube
- Adding a Dimension

After completing this module, you will be able to:
- Describe the considerations for a multidimensional database
- Create data sources and data source views
- Create a cube
- Implement security in a multidimensional database

Module 3: Working with Cubes and Dimensions
This module describes how to create and configure dimensions and dimension hierarchies in an Analysis Services multidimensional data model.
Lessons
- Configuring Dimensions
- Defining Attribute Hierarchies
- Sorting and Grouping Hierarchies

Lab: Defining Dimensions
- Configuring Dimensions and Attributes
- Creating Hierarchies
- Creating a Hierarchy with Attribute Relationships
- Creating a Ragged Hierarchy
- Browsing Dimensions and Hierarchies in a Cube

After completing this module, you will be able to:
Module 4: Working with Measures and Measure Groups
This module describes measures and measure groups. It also explains how you can use them to define fact tables and associate dimensions with measures.

Lessons
- Working with Measures
- Working with Measure Groups

Lab: Configuring Measures and Measure Groups
- Configuring Measures
- Defining a Regular Relationship
- Configuring Measure Group Storage

After completing this module, you will be able to:
- Configure measures
- Configure measure groups

Module 6: Enhancing a Cube
This module describes how to enhance a cube with Key Performance Indicators (KPIs), actions, perspectives, and translations.

Lessons
- Working with Key Performance Indicators
- Working with Actions
- Working with Perspectives
- Working with Translations

Lab: Customizing a Cube
- Implementing an Action
- Implementing Perspectives
- Implementing a Translation

After completing this module, you will be able to:
- Implement Key Performance Indicators
- Implement Actions
- Implement Perspectives
- Implement Translations

Module 5: Introduction to MDX
This module describes the fundamentals of MDX and explains how to build calculations, such as calculated members and named sets.

Lessons
- MDX Fundamentals
- Adding Calculations to a Cube
- Using MDX to Query a Cube

Lab: Using MDX
- Creating Calculated Members
- Querying a Cube by Using MDX

After completing this module, you will be able to:
- Describe MDX
- Add calculations to a cube
- Describe how to use MDX in client applications

Module 7: Implementing an Analysis Services Tabular Data Model
This module describes Analysis Services tabular data models and explains how to develop a tabular data model using the SQL Server Data Tools for Business Intelligence (BI) add-in for Visual Studio.

Lessons
- Introduction to Analysis Services Tabular Data Models
- Creating a Tabular Data Model
- Using an Analysis Services Tabular Data Model in the Enterprise

Lab: Implementing an Analysis Services Tabular Data Model
- Creating an Analysis Services Tabular Data Model Project
- Configuring Columns and Relationships
- Deploying an Analysis Services Tabular Data Model
Module 8: Introduction to DAX
This module explains the fundamentals of the DAX language. It also explains how you can use DAX to create calculated columns and measures, and how you can use them in your tabular data models.

Lessons
- DAX Fundamentals
- Enhancing a Tabular Data Model with DAX

Lab: Using DAX to Enhance a Tabular Data Model
- Creating Calculated Columns
- Creating Measures
- Creating a KPI
- Implementing a Parent-Child Hierarchy

After completing this module, you will be able to:
- Describe the fundamentals of DAX
- Use DAX to create calculated columns and measures

Module 9: Implementing Reports with SQL Server Reporting Services
This module introduces Microsoft SQL Server Reporting Services and discusses the tools and techniques that a professional BI developer can use to create and publish reports.

Lessons
- Introduction to Reporting Services
- Creating a Report with Report Designer
- Grouping and Aggregating Data in a Report
- Publishing and Viewing a Report

Lab: Creating a Report with Report Designer
- Creating a Report
- Grouping and Aggregating Data
- Publishing a Report

After completing this module, you will be able to:
- Describe the key features of Reporting Services
- Use Report Designer to create a report
- Group and aggregate data in a report
- Publish and view a report

Module 10: Enhancing Reports with SQL Server Reporting Services
This module describes how to enhance a SQL Server reporting Services report with charts and other visualizations, and how to use parameters to filter data in a report.

Lessons
- Showing Data Graphically
- Filtering Reports by Using Parameters

Lab: Enhancing a Report
- Adding a Chart to a Report
- Adding Parameters to a Report
- Using Data Bars and Sparklines
- Using a Map

After completing this module, you will be able to:
- Use charts and other visualizations to show data graphically in a report
- Use parameters to filter data in a report

Module 11: Managing Report Execution and Delivery
This module describes how to apply security and report execution settings, and how to create subscriptions to deliver reports.

Lessons
- Managing Report Security
- Managing Report Execution
- Subscriptions and Data Alerts
Module 12: Delivering BI with SharePoint PerformancePoint Services

This module introduces Microsoft SharePoint Server as a platform for BI, and then focuses on building BI dashboards and scorecards with PerformancePoint Services.

Lessons

- Introduction to SharePoint Server as a BI Platform
- Introduction to PerformancePoint Services
- PerformancePoint Data Sources and Time Intelligence
- Reports, Scorecards, and Dashboards

Lab: Implementing a SharePoint Server BI Solution

- Creating a SharePoint Server Site for BI
- Configuring PerformancePoint Data Access
- Creating PerformancePoint Reports
- Creating a PerformancePoint Scorecard
- Creating a PerformancePoint Dashboard

After completing this module, you will be able to:

- Describe SharePoint Server as a BI platform
- Use PerformancePoint Services to deliver BI functionality
- Configure PerformancePoint Data Sources

Module 13: Performing Predictive Analysis with Data Mining

This module introduces data mining, describes how to create a data mining solution, how to validate data mining models, how to use the Data Mining Add-ins for Microsoft Excel, and how to incorporate data mining results into Reporting Services reports.

Lessons

- Overview of Data Mining
- Creating a Data Mining Solution
- Validating a Data Mining Model
- Consuming Data Mining Data

Lab: Using Data Mining to Support a Marketing Campaign

- Using Table Analysis Tools
- Creating a Data Mining Structure
- Adding a Data Mining Model to a Data Mining Structure
- Validating a Data Mining Model
- Using a Data Mining Model in a Report

After completing this module, you will be able to:

- Describe the key data mining concepts and use the Data Mining Add-ins for Excel
- Create a data mining solution
- Validate data mining models
- Use data mining data in a report
About this Course

This five-day instructor-led course is intended for power users, who are tasked with working within the SharePoint 2013 environment. This course will provide a deeper, narrowly-focused training on the important and popular skills needed to be an administrator for SharePoint site collections and sites. SharePoint deployment or farm administration skills and tasks, which are required for IT professionals to manage SharePoint 2013, are available in separate Microsoft Official Courseware.

Audience Profile

This course is intended for SharePoint site collection administrators, site administrators and power users who are tasked with working within the SharePoint environment.

At Course Completion

After completing this course, students will be able to:

- Design and implement a company portal structure using SharePoint 2013 objects including sites, libraries, lists and pages
- Explain the role of security and permissions throughout SharePoint 2013
- Implement guidelines for consistency in building a company portal to aid in the day-to-day administration of content in SharePoint 2013
- Enhance the design of and content on a company portal using SharePoint 2013 themes and web parts
- Explain the importance of governance for the planning and managing future growth of the SharePoint 2013 implementation
- Identify options to integrate data from other systems as well as preserve existing data
- Explain the role of social networking in SharePoint 2013 and its impact on collaboration

Prerequisites

Before attending this course, students must have:

- Windows client operating system – either Windows XP, Windows 7 or Windows 8
- Microsoft Office 2007, Office 2010 or Office 2013
- Microsoft Internet Explorer 7, 8 or 9

It is recommended students have familiarity with previous versions of SharePoint, though it is not a required prerequisite.
Module 1: Getting Started with SharePoint 2013
This module introduces SharePoint 2013 concepts to site collection and site administrators. Once administrators can explain basic terminology and how to navigate around SharePoint, they have a solid foundation for the rest of the course.

Lessons
- Exploring SharePoint 2013 Site Collection and Site Administrator Roles
- Defining SharePoint Terminology
- Navigating a SharePoint Site
- Interacting with the Ribbon
- Creating and Editing Basic Content

After completing this module, students will be able to:
- Define SharePoint 2013 roles and terminology
- Navigate SharePoint 2013
- Utilize functions available in the Microsoft ribbon
- Create and add basic content to SharePoint

Module 2: Planning a Company Portal Using SharePoint 2013
Governance in SharePoint plays a critical role in determining the potential success of a SharePoint deployment. When a greater emphasis is placed on governance, it gives organizations a better chance to succeed in the deployment and maintenance of SharePoint. Each organization must ensure that the proper policies and procedures are in place to keep SharePoint aligned with the overall business goals, even as business needs change. This module introduces the concept of governance and highlights best practices.

Lessons
- Defining SharePoint Governance
- Working with Information Architecture
- Implementing Site Hierarchies

Module 3: Creating a Company Portal
The first major milestone, after planning the company portal, is executing and building the site structure. The site structure includes the components for storing and presenting information namely sites, lists and libraries and apps, which are new to SharePoint 2013. Because the site structure provides the framework for the entire portal, it is essential that site collection administrators have a firm grasp of creating sites, document libraries and lists, as well as managing navigation.

Lessons
- Creating a Site Structure
- Defining SharePoint Apps
- Customizing Lists and Libraries
- Explaining Views on Lists and Libraries
- Creating Views on Lists and Libraries
- Modifying Navigation

Lab: Creating a Structured Company Portal
- Creating a New Main Department Site
- Creating a New Child Department Site
- Create New Apps for Documents and Lists
- Modifying Columns on an Existing List
- Adding Columns to an Existing List or Library
- Working with Versioning and Content Approval
Module 4: Creating Consistency across Sites
When setting up a SharePoint site collection, it will often involve repeating a certain number of tasks. Site collection administrators can reduce the effort of duplication by creating reusable objects in a central location by using the tools provided. When defining these in a single spot, site collection administrators can more efficiently manage their site collections as well as maintain consistency throughout the site.

Lessons
- Defining Site Columns
- Defining Content Types
- Implementing a Taxonomy
- Configuring the Content Organizer
- Using Templates to Promote Consistency

Lab : Creating Custom Columns and Content Types
- Creating a Content Type
- Applying Content Types to Libraries

Lab : Implementing a Taxonomy
- Designing a Taxonomy
- Adding Managed Metadata Columns

Lab : Configuring the Content Organizer
- Setting Column Default Values

Module 5: Securing a Company Portal
This module explains how permissions work within a site collection, and how the tools within SharePoint 2013 are used to manage and maintain them. It is crucial that SharePoint 2013 site collection and site administrators are able to create and manage permissions within SharePoint 2013.

Lessons
- Explaining Permissions and Security in SharePoint
- Creating SharePoint Groups
- Managing Permissions within SharePoint
- Sharing versus Traditional Security

Lab : Managing Permissions in SharePoint
- Viewing Permissions of SharePoint Objects
- Adding Users and Groups to SharePoint Objects
- Creating a New SharePoint Group with Custom Permissions
- Creating New SharePoint Objects with Unique Permissions

After completing this module, students will be able to:
MS 53033
SharePoint 2013 Site Collection and Site Administration

COURSE OUTLINE

- Explain the concept of sharing
- Design and implement security
- Define best practices around SharePoint 2013 security

Module 6: Customizing the Look of a Portal
This module explains how to design a company portal using out-of-the-box web parts and themes in SharePoint 2013.

Lessons
- Changing the Appearance of the Portal
- Editing a Page
- Working with Web Parts and App Parts
- Targeting Audiences with Content

Lab : Adding and Configuring Web Parts
- Creating the Content Type
- Applying the Content Type
- Creating a List Template
- Adding Content to a List
- Creating a Managed Property
- Adding the Content Search Web Part

Lab : Connecting Web Parts
- Creating a Project Site
- Creating an Issue Tracking List
- Updating the Home Page
- Testing the Home Page

Lab : Applying Themes to Your Company Portal
- Adjusting the Theme
- Changing the Logo

After completing this module, students will be able to:
- Implement themes and add a logo
- Add web parts to pages

- Leverage audiences for targeting content

Module 7: Extending a Company Portal
This module covers how companies can extend their SharePoint 2013 environment to include data from other line of business applications using SharePoint Designer 2013. It also explores how companies can leverage SharePoint for records management and eDiscovery.

Lessons
- Creating External Content Types
- Setting up an eDiscovery Center
- Exploring other Records Management Options

Lab : Accessing External Data
- Create the External Content Type
- Creating the Lists and Forms
- Testing the External List
- Working with Business Data Web Parts

Lab : Leveraging Records Management to Preserve Data
- Using a Records Center
- Using an eDiscovery Center

After completing this module, students will be able to:
- Define external content types
- Define and implement records management
- Define and implement an eDiscovery center

Module 8: Leveraging Web Content Management
This module defines the process for using the publishing features of SharePoint 2013 to create rich content pages.

Lessons
COURSE OUTLINE

- Enabling Web Content Management
- Managing the Structure of Web Content
- Navigating a Site Using Managed Metadata
- Configuring a Published Approval Workflow

**Lab : Creating a Rich Publishing Site**

- Creating a Web Content Management Site
- Creating a News Site
- Setting the Default Page Layout
- Configuring Image Renditions
- Creating News Pages

**Lab : Configuring a Published Approval Process**

- Adding a Publishing Approval Workflow
- Testing the Workflow

**Lab : Implementing a Managed Navigation Site**

- Enabling the Managed Metadata Navigation
- Creating Navigation Terms
- Creating Additional News Pages
- Controlling the Navigation and Page Structure

After completing this module, students will be able to:

- Enable web content management
- Create a Managed Metadata navigation site
- Implement image constraints
- Define the structure of pages
- Implement a publishing workflow

**Module 9: Bridging the Social Gap**

An important advancement in SharePoint 2013 is the expansion of social computing features. Many organizations have challenges when working with internal talent management, also known as knowledge management. For example, an organization may need to find an individual with the specific skills and knowledge to assist in completing a task or project.

SharePoint 2013 offers a viable platform to help organizations with talent or knowledge management.

**Lessons**

- Configuring Social Features in SharePoint 2013
- Creating a Community Site

**Lab : Designing a Social Experience in SharePoint 2013**

- Enabling Content Ratings
- Configuring RSS Feeds
- Enabling Social Features in My Profile

**Lab : Creating a Community Site**

- Creating the Community Site
- Configuring the Community Site
- Creating a Discussion
- Replying to a Discussion
- Managing a Discussion

After completing this module, students will be able to:

- Describe the role of social computing in SharePoint 2013
- Describe best practices for implementing social collaboration
- Design a social experience
- Implement a community site leveraging the social computing features of SharePoint 2013

**Module 10: Finding Information Using Search**

It is often challenging for many organizations to find information quickly and easily. Users can use the search function within SharePoint 2013 to search across a variety of content sources including documents, people and line of business applications with little to no additional configuration. With a small amount of effort, however, organizations can create a
robust search experience that is in alignment with their business needs. In this module, students will learn how to leverage search within SharePoint 2013 to help users more quickly find the information they need.

Lessons

- Exploring the Search Features of SharePoint 2013
- Configuring the Search Settings

Lab: Configuring an Advanced Search Center

- Connecting to a Search Center
- Creating a Managed Property
- Creating a Result Source
- Configuring the Search Center
- Updating the Refinement Panel
- Updating Search Navigation

After completing this module, students will be able to:

- Create an enterprise Search Center
- Customize the Search Center

Module 11: Controlling and Planning for Growth

It is necessary to develop a formal governance plan and committee to maintain quality and consistency in SharePoint. Governance defines policies, procedures and guidelines for how SharePoint will be managed and outlines the roles, responsibilities and actions required to administer and support the SharePoint environment.

Lessons

- Reviewing Governance for Site Administration
- Discussing the Execution of Governance

After completing this module, students will be able to:

- Explain the role of governance for SharePoint
- Develop a governance plan and team

Module 12: Administering a Company Portal Built on SharePoint 2013

This module covers other tools and settings in SharePoint 2013. Site collection administrators or site administrators work as part of their day-to-day activities.

Lessons

- Exploring Settings for Site Collection Administrators
- Exploring Settings for Site Administrators

After completing this module, students will be able to:

- Identify additional settings for site collection administrators
- Identify additional settings for site administrators
About this Course

This three-day, instructor-led course is intended for individuals who are interested in expanding their knowledge base and technical skills about Microsoft Project. The course begins with the basic concepts and leads students through all the functions they’ll need to plan and manage a small to medium-size project, including how to level resources and capture both cost and schedule progress.

This course will also help students prepare for Microsoft Project 2013 Exam 74-343 Managing Projects with Microsoft Project 2013.

Audience Profile

This course is intended for both novice and experienced project managers, managers, schedulers, and other project stakeholders who need to incorporate the discipline of project management with Microsoft Project 2013.

At Course Completion

After completing this course, students will be able to:

- Understand the discipline of project management as it applies to using Microsoft Project 2013
- Create a Work Breakdown Structure
- Identify Task Types & Relationships
- Define Resources within Project
- Make Work Package Estimates
- Create an Initial Schedule
- Create Projects from templates, Excel files
- Create Global templates
- Create formulas and graphical indicators
- The steps to record a macro
- Format Output and Print Reports
- Integrate Multiple Projects
- Set up a Project with a Calendar, State date, and Scheduling Method
- Understand Manually Schedule vs. Auto Schedule
- Manage multiple projects
- Be able to create a master project list with shared resources

Prerequisites

There are no prerequisites for attending the course. However, it is helpful to have taken an introductory project management course, such as Versatile’s Principles of Project Management.

Course Outline

Module 1: Introduction to Microsoft Project

This module provides an overview of how the features of Project relate to the job of the project manager. The module also teaches the student how to access different features by navigating through the ribbon.

<table>
<thead>
<tr>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe how Project relates to the discipline of Project Management</td>
</tr>
<tr>
<td>Learn what the new features are in Project 2013</td>
</tr>
<tr>
<td>Navigate to the primary views available using the Ribbon</td>
</tr>
<tr>
<td>Choose Views that display task, resource, or assignment information</td>
</tr>
</tbody>
</table>
After completing this module, students will be able to:

- Assign resources to tasks
- Understand the benefits of baselining a project for specific tasks
- Understand the basics of how to track project progress

**Module 3: Setting Up a Project**

This module explains how to create a new project and establish the basic constraints that Microsoft Project 2013 will use for its calculations

**Lessons**

- Use multiple methods to create a new project from an Excel file and a SharePoint Tasks list
- Establish one or more calendars to constrain resource availability
- Configure Project to calculate the schedule from the Start Date forward, or from the Finish Date backward

**Lab: Setting Up a Project**

- Learn how to add Holidays to the company calendar
- Learn how to make a custom calendar
- Learn how to set the Project Start date
- Learn how to set constraints

After completing this module, students will be able to:

- Create a new project using a template, Excel, a SharePoint Tasks List or a new Project file
- Establish one or more calendars to constrain resource availability
- Configure Microsoft Project to calculate the schedule from the Start Date forward or from the Finish Date backward

**Module 4: Manually Schedule vs. Auto Schedule**

This module explains how to manually schedule project tasks and how to leverage the auto schedule feature.

**Lessons**

- Students practice switching tasks between Manually Schedule and Auto Schedule modes. By switching modes, students learn the impact made on the project schedule and the individual tasks.

**Lab: Explore Task Modes**

- Describe which project functions are turned off for tasks using Manually Schedule mode
- Change the task mode from Manually Schedule to Auto Schedule and back
- Identify tasks that are in Manually Schedule mode by the task mode column and shape on the Gantt chart
- Describe situations that are particularly appropriate for using Manually Schedule
- Describe the limitations that a user must be aware of when using Manually Schedule mode.

After completing this module, students will be able to:

- Understand how to turn on Manually Schedule and Auto Schedule
- Understand when to use Manually Schedule
- Understand the limitations of Manually Scheduling.

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**Module 2: A Quick and Easy Overview of Managing with Project**

This module demonstrates the required steps to create and use Microsoft Project 2031 through the life cycle of a project.

**Lessons**

- Create a new project and prepare it for data entry
- Enter project tasks
- Sequence the tasks
- Define resources
- Estimate Task duration and assign resources
- Baseline the project
- Task project progress

**Lab: Creating a Basic Project with a template**

- Learn how to create a project plan from a template
- Learn how to turn off the timeline
- Learn how to change the project start date
- Learn how to add holidays to the company calendar

**Lab: Creating a Basic Project**

- Learn how to add resources and their cost
- Learn how to switch views
- Learn how to insert summary tasks
- Learn how to link tasks and summary tasks

After completing this module, students will be able to:

- Prepare a new project plan and set the date and other basic information
- Enter detailed project information
- Understand how to sequence tasks
- Understand and define basic resource types

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**Lab: Introduction to Mastering Microsoft Project**

- Learn how to change views from a table to a chart
- Learn the different subcommands that are under each command group
- Learn what functions are under the format tab
- Learn how to access the backstage

After completing this module, students will be able to:

- Have a fundamental understanding of how Microsoft Project will help them track their projects
- Understand what is new in Project 2013 and how it will increase their productivity
- Learn how the ribbon will help them get the most out of this productivity tool
- Learn how to quickly change views and see what is going on with their projects
- Understand the 5 essential steps in building a successful project plan

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**Lab: Creating a Basic Project with a template**

- Learn how to create a basic project
- Learn how to edit
- Relate the features of Project to the 5 steps for building a plan in Project
Module 5: Creating a Work Breakdown Structure
This module explains how to create a useful work breakdown structure and enter it into Microsoft Project.

Lessons
- Build and use summary and subordinate tasks
- Understand and use milestones
- Develop WBS Outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS templates

Lab: Manipulate a WBS
- Learn how to create and manipulate WBS
- Learn how to utilize an Outline
- Learn how to create notes within tasks

Lab: Supporting the Project Plan
- Learn how to hyperlink project artifacts to your project plan
- Learn how to create reoccurring tasks

After completing this module, students will be able to:
- Build and use summary and subordinate tasks
- Understand and use milestones
- Organize the WBS
- Format the WBS
- Develop WBS outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS Outlines
- Understand how to link Project artifacts to their projects
- Understand how to create notes on tasks

Module 6: Identifying Task Relationships
This module explains the rules for establishing dependency links between tasks and how to use Project to display these dependencies.

Lessons
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand and use lag, lad, and delay

Lab: Display the sequence
- Identify the different ways to create dependent relationships
- Format a Network diagram
- Modifying dependency lines
- Modifying items to be shown on the critical path

After completing this module, students will be able to:
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand how to use Lag, Lead and Delay

Module 7: Defining Resources within Project
This module explains how to enter resources and specific resource information in Microsoft Project and assign resources to specific tasks.

Lessons
- Define resource types
- Define individual resources that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Lab: Resource Calendar and Availability
- Add holidays to a standard calendar
- Applying different types of calendars to a project and analyzing the impact to the project schedule
- Applying vacation schedules to the calendar
- Replace resources based upon the resource’s calendar

After completing this module, students will be able to:
- Define the different types of resources
- Define individual resources that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Module 8: Making Work Package Estimates
This module explains how Microsoft Project calculates task duration, task work (effort) and task resources. Students will be able to choose among three task types as they enter task estimates and they will know which task type is appropriate for the type of estimate they are making.

Lessons
- Enter estimates for duration and costs for each task
- Distinguish between task types and describe when each is appropriate
- Describe the relationship between work, units and duration
- Describe the way Effort Driven scheduling is affected by work, units and duration
- Assign tasks to resources using the Team Planner view

Lab: Work, Duration and Labor
- Analyze the impact of duration, work and labor
- Create material resources and assigning cost to the resource
- Understand how to leverage Project statistics
- Apply a material resource to a task and examine the impact to project costs

After completing this module, students will be able to:
- Assign values for resources, duration and work
- Understand task types
Module 9: Creating an Initial Schedule

This module explains how Project calculates a schedule based on task relationships and task duration. Students will understand the purpose of identifying critical path tasks and will be able to identify schedule float within the project.

Lessons
- Calculate float and identify a project’s critical path
- Understand difference between slack and slippage
- Calculate float
- How to leverage constraints
- How to get the benefit from the Task Inspector, and the impact of changes on a project schedule

Lab: Calculating an Initial Schedule
- Reviewing changes that can have positive or negative impact on the project plan.

After completing this module, students will be able to:
- Identify the critical path
- Understand difference between slack and slippage
- Calculate float
- How to leverage constraints
- How to get the benefit from the Task Inspector, and the impact of changes on a project schedule

Module 10: Create a Resource Leveled Schedule

This module explains how over-allocated resources create unrealistic schedules and shows methods for rescheduling in order to create a realistic schedule based on resource availability.

Lessons
- Adjust a project schedule to account for limited people and other resources
- View the overall cost and schedule of a project
- Identify resources that have been overallocated for a project schedule
- Use multiple ways to adjust tasks and assignments to remove over allocation for any resource

Lab: Resource Leveling
- Evaluate the project’s resource plan using the resource views
- Adjust the schedule manually
- Adjust the schedule using the leveling feature

After completing this module, students will be able to:
- Adjust a project schedule to account for limited resources
- View the overall cost and schedule for a project
- Identify resources that are over-allocated for a project schedule
- Use multiple ways to adjust tasks and assignments to remove over-allocation for any resource

Module 11: Managing the Project

This module explains how to use Microsoft Project to control a project. Students will save their plan to a baseline and see how entering actual task performance data enables them to view differences between planned and actual performance.

Lessons
- Learn how to set a baseline
- Learn how to enter a track project performance data
- Learn how to apply different tracking methods
- Learn how to perform a variance analysis on a project

Lab: The Baseline
- Use Project Statistics to see the changes in a project plan
- Use the variance tables to understand the changes in a project plan
- Understand the value of baselining

Lab: Baselining & Tracking Performance
- Understand the value of Baselining a project
- Understand how to Enter Actuals and measuring their impact

Lab: Variance
- Understand how variance is calculated with cost, finish and work

After completing this module, students will be able to:
- Set a baseline
- Enter and manage project performance data
- Pick a tracking method
- Perform variance analysis
- Sync Projects results with SharePoint

Module 12: Formatting Output and Printing Reports

Participants will be able to control project output by creating and using Custom Fields, Sorting, Filtering and Grouping of the project data.

Lessons
- Print
- Views
- Formats
- Sorting
- Filtering
- Grouping
- Custom Fields
- Reporting
- Other File Formats

Lab: Using the Grouping Feature
- Create new fields to group
- Create new group fields
- Create new views

Lab: Create Reports in Project 2013
- Learn how to leverage Microsoft Project’s View Report features
- Learn how to create a Visual Report

After completing this module, students will be able to:
• Create standardized views, with the power of sorting, filtering and grouping.
• Customize a variety of standard reports
• Learn how to use Visual Reports
• Export reports in a variety of formats

Module 13: Managing Multiple Projects
This module explains how to view many projects as parts of one very large project in order to gain new views on resource availability and task relationships among projects.

Lessons
• Learn how to use common resources among multiple projects
• Learn how to link tasks between multiple projects
• Learn how to create a consolidated view of multiple projects

Lab: Identifying Overallocated Resources from a Resource Pool and Consolidated File
• Learn how to create a master project file
• Open Resource Pool
• Learn how to look for over-allocated resources

After completing this module, students will be able to:
• Use common resources among multiple projects
• Link tasks between multiple projects
• Create a consolidated view of multiple projects and share resources

Module 14: Advanced Topics
This module explains how to leverage some of the advanced features of Microsoft Project.

Lessons
• Learn how to customize the Ribbon and the Quick Access Toolbar
• Learn how to customize WBS numbering
• Learn the concepts of Formulas and Graphical indicators
• Learn the purpose of the Global template and Organizer
• Learn how to use Task Deadlines

Lab: Recording a Macro in Project 2013
• Learn how to create a macro that will automate a process

After completing this module, students will be able to:
• Take advantage of the advance features of Microsoft Project 2013
• Create a Macro
• Share common settings among all future projects

Module 15: Summary
This module provides an overview of the topics presented in the course and how to prepare for Microsoft’s exam 74-343 Microsoft Project 2013, Managing Projects with Project 2013

Lessons
• Learn how to access the Office App Store
• Learn what 74-343 Microsoft Project 2013, Managing Projects with Project 2013 exam will cover and what is in the objective domain
• A sample study guide to help students prepare for the Microsoft Project 2013 exam
About this Course

This three-day, instructor-led course is intended for individuals who are interested in expanding their knowledge base and technical skills about Microsoft Project. The course begins with the basic concepts and leads students through all the functions they’ll need to plan and manage a small to medium-size project, including how to level resources and capture both cost and schedule progress.

This course will also help students prepare for Microsoft Project 2013 Exam 74-343 Managing Projects with Microsoft Project 2013.

Audience Profile

This course is intended for both novice and experienced project managers, managers, schedulers, and other project stakeholders who need to incorporate the discipline of project management with Microsoft Project 2013.

At Course Completion

After completing this course, students will be able to:

• Understand the discipline of project management as it applies to using Microsoft Project 2013
• Create a Work Breakdown Structure
• Identify Task Types & Relationships
• Define Resources within Project
• Make Work Package Estimates
• Create an Initial Schedule
• Create Projects from templates, Excel files
• Create Global templates
• Create formulas and graphical indicators
• The steps to record a macro
• Format Output and Print Reports
• Integrate Multiple Projects
• Set up a Project with a Calendar, State date, and Scheudling Method
• Understand Manually Schedule vs. Auto Schedule
• Manage multiple projects
• Be able to create a master project list with shared resources

Prerequisites

There are no prerequisites for attending the course. However, it is helpful to have taken an introductory project management course, such as Versatile’s Principles of Project Management.

Course Outline

Module 1: Introduction to Microsoft Project

This module provides an overview of how the features of Project relate to the job of the project manager. The module also teaches the student how to access different features by navigating through the ribbon.

Lessons

• Describe how Project relates to the discipline of Project Management
• Learn what the new features are in Project 2013
• Navigate to the primary views available using the Ribbon
• Choose Views that display task, resource, or assignment information
Module 2: A Quick and Easy Overview of Managing with Project

This module demonstrates the required steps to create and use Microsoft Project 2031 through the life cycle of a project.

Lessons
- Create a new project and prepare it for data entry
- Enter project tasks
- Sequence the tasks
- Define resources
- Estimate Task duration and assign resources
- Baseline the project
- Task project progress

Lab: Creating a Basic Project with a template

- Learn how to create a project plan from a template
- Learn how to turn off the timeline
- Learn how to change the project start date
- Learn how to add holidays to the company calendar

Lab: Creating a Basic Project

- Learn how to add resources and their cost
- Learn how to switch views
- Learn how to insert summary tasks
- Learn how to link tasks and summary tasks

After completing this module, students will be able to:
- Prepare a new project plan and set the date and other basic information
- Enter detailed project information
- Understand how to sequence tasks
- Understand and define basic resource types
- Assign resources to tasks
- Understand the benefits of baselining a project for specific tasks
- Understand the basics of how to track project progress

Module 3: Setting Up a Project

This module explains how to create a new project and establish the basic constraints that Microsoft Project 2013 will use for its calculations.

Lessons
- Use multiple methods to create a new project from an Excel file and a SharePoint Tasks List
- Establish one or more calendars to constrain resource availability
- Configure Project to calculate the schedule from the Start Date forward, or from the Finish Date backward

Lab: Setting Up a Project

- Learn how to add Holidays to the company calendar
- Learn how to make a custom calendar
- Learn how to set the Project Start date
- Learn how to set constraints

After completing this module, students will be able to:
- Create a new project using a template, Excel, a SharePoint Tasks List or a new Project file
- Establish one or more calendars to constrain resource availability
- Configure Microsoft Project to calculate the schedule from the Start Date forward or from the Finish Date backward

Module 4: Manually Schedule vs. Auto Schedule

This module explains how to manually schedule project tasks and how to leverage the auto schedule feature.

Lessons
- Students practice switching tasks between Manually Schedule and Auto Schedule modes. By switching modes, students learn the impact made on the project schedule and the individual tasks.

Lab: Explore Task Modes

- Describe which project functions are turned off for tasks using Manually Schedule mode
- Change the task mode from Manually Schedule to Auto Schedule and back
- Identify tasks that are in Manually Schedule mode by the task mode column and shape on the Gantt chart
- Describe situations that are particularly appropriate for using Manually Schedule
- Describe the limitations that a user must be aware of when using Manually Schedule mode.

After completing this module, students will be able to:
- Understand how to turn on Manually Schedule and Auto Schedule
- Understand when to use Manually Schedule
- Understand the limitations of Manually Scheduling.
Module 5: Creating a Work Breakdown Structure
This module explains how to create a useful work breakdown structure and enter it into Microsoft Project.

Lessons
- Build and use summary and subordinate tasks
- Understand and use milestones
- Develop WBS Outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS templates

Lab: Manipulate a WBS
- Learn how to create and manipulate WBS
- Learn how to utilize an Outline
- Learn how to create notes within tasks

Lab: Supporting the Project Plan
- Learn how to hyperlink project artifacts to your project plan
- Learn how to create reoccurring tasks

After completing this module, students will be able to:
- Build and use summary and subordinate tasks
- Understand and use milestones
- Organize the WBS
- Format the WBS
- Develop WBS outlines
- Assign completion criteria
- Evaluate the WBS
- Understand and use WBS Outlines
- Understand how to link Project artifacts to their projects
- Understand how to create notes on tasks

Module 6: Identifying Task Relationships
This module explains the rules for establishing dependency links between tasks and how to use Project to display these dependencies.

Lessons
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand and use lag, lad, and delay
- Understand the new feature of Task Paths

Lab: Display the sequence
- Identify the different ways to create dependent relationships
- Format a Network diagram
- Modifying dependency lines
- Modifying items to be shown on the critical path

After completing this module, students will be able to:
- Understand the different types of task relationships
- Understand and use various methods to create relationships
- Determine and display task sequence
- Understand how to use Lag, Lead and Delay

Module 7: Defining Resources within Project
This module explains how to enter resources and specific resource information in Microsoft Project and assign resources to specific tasks.

Lessons
- Define resource types
- Define individual resources that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Lab: Resource Calendar and Availability
- Add holidays to a standard calendar
- Applying different types of calendars to a project and analyzing the impact to the project schedule
- Applying vacation schedules to the calendar
- Replace resources based upon the resource’s calendar

After completing this module, students will be able to:
- Define the different types of resources
- Define individual resources that will be used on the project
- Record the cost(s) of using each type of resource
- Record the limit of availability for each type of resource by establishing a resource calendar and defining the maximum units of that resource

Module 8: Making Work Package Estimates
This module explains how Microsoft Project calculates task duration, task work (effort) and task resources. Students will be able to choose among three task types as they enter task estimates and they will know which task type is appropriate for the type of estimate they are making.

Lessons
- Enter estimates for duration and costs for each task
- Distinguish between task types and describe when each is appropriate
- Describe the relationship between work, units and duration
- Describe the way Effort Driven scheduling is affected by work, units and duration
- Assign tasks to resources using the Team Planner view

Lab: Work, Duration and Labor
- Analyze the impact of duration, work and labor
- Create material resources and assigning cost to the resource
- Understand how to leverage Project statistics
- Apply a material resource to a task and examine the impact to project costs

After completing this module, students will be able to:
- Assign values for resources, duration and work
- Understand task types
Module 9: Creating an Initial Schedule

This module explains how Project calculates a schedule based on task relationships and task duration. Students will understand the purpose of identifying critical path tasks and will be able to identify schedule float within the project.

Lessons
- Calculate float and identify a project’s critical path
- Understand and identify task constraints
- Create milestones
- Use the Task Inspector to troubleshoot the initial schedule

Lab: Calculating an Initial Schedule
- Reviewing changes that can have positive or negative impact on the project plan.

After completing this module, students will be able to:
- Identify the critical path
- Understand difference between slack and slippage
- Calculate float
- How to leverage constraints
- How to get the benefit from the Task Inspector, and the impact of changes on a project schedule

Module 10: Create a Resource Leveled Schedule

This module explains how over-allocated resources create unrealistic schedules and shows methods for rescheduling in order to create a realistic schedule based on resource availability.

Lessons
- Adjust a project schedule to account for limited people and other resources
- View the overall cost and schedule of a project
- Identify resources that have been overallocated for a project schedule
- Use multiple ways to adjust tasks and assignments to remove over allocation for any resource

Lab: Resource Leveling
- Evaluate the project’s resource plan using the resource views
- Adjust the schedule manually
- Adjust the schedule using the leveling feature

After completing this module, students will be able to:
- Adjust a project schedule to account for limited resources
- View the overall cost and schedule for a project
- Identify resources that are over-allocated for a project schedule
- Use multiple ways to adjust tasks and assignments to remove over-allocation for any resource

Module 11: Managing the Project

This module explains how to use Microsoft Project to control a project. Students will save their plan to a baseline and see how entering actual task performance data enables them to view differences between planned and actual performance.

Lessons
- Learn how to set a baseline
- Learn how to enter a track project performance data
- Learn how to apply different tracking methods
- Learn how to perform a variance analysis on a project

Lab: The Baseline
- Use Project Statistics to see the changes in a project plan
- Use the variance tables to understand the changes in a project plan
- Understand the value of baselining

Lab: Baselining & Tracking Performance
- Understand the value of Baselining a project
- Understand how to Enter Actuals and measuring their impact

Lab: Variance
- Understand how variance is calculated with cost, finish and work

After completing this module, students will be able to:
- Set a baseline
- Enter and manage project performance data
- Pick a tracking method
- Perform variance analysis
- Sync Projects results with SharePoint

Module 12: Formatting Output and Printing Reports

Participants will be able to control project output by creating and using Custom Fields, Sorting, Filtering and Grouping of the project data.

Lessons
- Print
- Views
- Formats
- Sorting
- Filtering
- Grouping
- Custom Fields
- Reporting
- Other File Formats

Lab: Using the Grouping Feature
- Create new fields to group
- Create new group fields
- Create new views

Lab: Create Reports in Project 2013
- Learn how to leverage Microsoft Project’s View Report features
- Learn how to create a Visual Report

After completing this module, students will be able to:
• Create standardized views, with the power of sorting, filtering and grouping.
• Customize a variety of standard reports
• Learn how to use Visual Reports
• Export reports in a variety of formats

Module 13: Managing Multiple Projects
This module explains how to view many projects as parts of one very large project in order to gain new views on resource availability and task relationships among projects.

Lessons
• Learn how to use common resources among multiple projects
• Learn how to link tasks between multiple projects
• Learn how to create a consolidated view of multiple projects

Lab: Identifying Overallocated Resources from a Resource Pool and Consolidated File
• Learn how to create a master project file
• Open Resource Pool
• Learn how to look for over-allocated resources

After completing this module, students will be able to:
• Use common resources among multiple projects
• Link tasks between multiple projects
• Create a consolidated view of multiple projects and share resources

Module 14: Advanced Topics
This module explains how to leverage some of the advanced features of Microsoft Project.

Lessons
• Learn how to customize the Ribbon and the Quick Access Toolbar
• Learn how to customize WBS numbering
• Learn the concepts of Formulas and Graphical indicators
• Learn the purpose of the Global template and Organizer
• Learn how to use Task Deadlines

Lab: Recording a Macro in Project 2013
• Learn how to create a macro that will automate a process

After completing this module, students will be able to:
• Take advantage of the advance features of Microsoft Project 2013
• Create a Macro
• Share common settings among all future projects

Module 15: Summary
This module provides an overview of the topics presented in the course and how to prepare for Microsoft’s exam 74-343 Microsoft Project 2013, Managing Projects with Project 2013

Lessons
• Learn how to access the Office App Store
• Learn what 74-343 Microsoft Project 2013, Managing Projects with Project 2013 exam will cover and what is in the objective domain
• A sample study guide to help students prepare for the Microsoft Project 2013 exam
Microsoft SharePoint 2013 End User Level 1
Course#: MS55050

Length: 3 days
Audience: Information Workers
Level: 200
Technology: Microsoft SharePoint Server 2013
Type: Hands-on Course
Delivery Method: Instructor-led Classroom

About this Course
This 3-day Instructor-Led course explores all the basic end user features of SharePoint 2013 including all basic lists and sites (aka “Apps”). Learn to assign basic and advanced permissions. Explore the new project and community sites as well as how to work with the new social features of My Sites. Building and sending search queries is also covered.

Audience Profile
Business users and anyone that works with SharePoint sites on a regular basis.

At Course Completion
After completing this course, students will be able to:
• Understand and work with SharePoint Lists, Lists Management tasks, Permissions and basic SharePoint Foundation sites, My Sites, Newsfeeds and Search queries.

Prerequisites
Before attending this course, students must have basic understanding of websites and SharePoint sites.

Module Outline

Module 1: SharePoint Introduction
In this module, we are going to answer the all important questions of What and Why should we be using SharePoint. We are also going to look at several of the new and exciting features of SharePoint 2013!

Lessons
• What is SharePoint?
• Why SharePoint?
• What’s New in SharePoint 2013?
• Driving End User Adoption

After completing this module, students will be able to:
• Describe the site topology components of SharePoint
• Describe the new features and capabilities of SharePoint 2013 as compared to older versions
• Describe what business problems SharePoint can address

Module 2: Callibration Experience
In this module we take a look at the site creation process, common features of the basic team site, advanced features of a Team Site and the new features of SharePoint 2013. We will also take a look at the new features introduced in SharePoint 2013 from a callibration and UI perspective.

Lessons
• Site Structure
• Basic SharePoint Features
• New SharePoint Features

Lab: SharePoint 2013 UI
• Explore 2013 UI Changes

After completing this module, students will be able to:
• Describe the new UI features of SharePoint 2013
• Understand how the Ribbon works
• Understand how to use the new callouts feature

Module 3: Lists
In this module, we are going to take a look at lists from an end user standpoint, but also very quickly from a database standpoint as well. We will talk about all the basic SharePoint Lists and the new lists in SharePoint 2013 and what things have changed when working with any type of list.

Lessons
• Lists
• List Views
• SharePoint 2013 Features
**COURSE OUTLINE**

### Lab: Document Library
- Create a document Library
- Create Documents and Folders
- Explore Callouts
- Uploading Documents
- Explorer View

### Lab: Form Library
- Create a Form Library
- Create an InfoPath Form
- Publish a Form

### Lab: Wiki Pages
- Create Wiki Page Library
- Add Wiki Pages
- Editing Wiki Pages
- History

### Lab: Picture Library
- Create a Picture Library
- Upload Pictures
- Picture Views
- Referencing Pictures

### Lab: Report Library
- Create a Report Library
- Create a Report
- Upload a Report
- Run a Report
- Reporthistory

### Lab: Data connection Library
- Create a Data Connection Library
- Create/Upload an Office Data Connection (ODC)
- Create/Upload a Universal Data Connection (UDC)

### Lab: Asset Library
- Create an Asset Library

### Lab: Surveys
- Create a Survey
- Create Questions
- Change question ordering
- Branching Logic
- Fill out the survey
- Anonymous Surveys?

### Lab: Custom Lists
- Create a Custom List
- Add one of each column type

### Lab: General Lists
- Create an Announcement List

### Lab: Promoted Links
- Creating Promoted Links APP
- Using the Promoted Links APP

### Lab: Views
- Creating Views (Standard, DataSheet, Access)
- Adding/Ordering Columns
- Sorting Data
- Filtering Data
- Grouping Data
- Totalling Data
- Setting Style
- Item Limits
- Mobile
- Enabling View
- Datasheet Metadata Editing

### Lab: Business Connectivity Services and External Content Types
- Explore External Content Types
- Create a new External Content Type
- Create an External List
- Setup and Configure Permissions for External List
- Add items to an External List

### Lab: GeoLocation Field
- Adding a GeoLocation Field

After completing this module, students will be able to:
- Understand when to use a List and when to use a Database
- Create and use the various lists in SharePoint
- Add list columns to tag your content with metadata
- Create Document Sets
- Create External Content Type Lists

### Module 4: List Management

We explored the types of lists that come out of the box in the last module. In this module, we will explore how to manage those lists!

### Lessons
- Basic List Management
- Advanced List Management

### Lab: List Management
- RSS Feeds
- Check out/Check In
- Document/Item Properties
- Site Columns
Module 5: Permissions

In this module we take a look at SharePoint Permissions. We will learn about SharePoint groups, permission levels, permissions and explore the new Permission Finders.

Lessons
- SharePoint Permissions

Lab: SharePoint Permissions
- Review Default Groups
- Add users to a site
- Requests for access

Module 6: Foundation Site Definitions

In this module we are going to review the SharePoint Foundation site definitions.

Lessons
- Creating Sites
- SharePoint Foundation Sites

Lab: SharePoint Foundation Definitions
- Create Sub Sites (Team Sites)
- Create/Use a Blog Site
- Create/Use a Wiki Site
- Delete a Site
- Restore a Site

Lab: New SharePoint Sites
- Create a Project Site
- Create a Community Site
- Work with Badges and Reputation
- Enable Offensive Content Reporting

After completing this module, students will be able to:
- Work with team, blog and wiki sites
- Understand how to create a project and community site.
- Work with a community site (reputation, content moderation, badges, etc)

Module 7: Office Integration

In this module we are going to take a look at how SharePoint and Office interact with each other and how they handle mobile devices.

Lessons
- Web Applications
- Office Integration
Module 8: My Site

In this module we will review the new Social Computing features in SharePoint 2013 and how My Sites has been completely redesigned to support social.

Lessons
- My Site
- What is Social Computing

Lab: My Site
- Create you’re my Site
- Newsfeeds
- Hashtags and Mentions
- Following
- User Profile
- Notification Settings
- Apps
- My Blog
- My Tasks

After completing this module, students will be able to:
- Describe what a My Site is
- Create and modify a My Site
- Work with My Site social networking features (Newsfeeds, Following, Hashtags and Mentions)
- Protect yourself in the Social Computing realm

Module 9: Search

In this module you will learn how to effectively query the Search Index to find items you are looking for.

Lessons
- Performing Queries

Lab: Performing Search Queries
- Performing simple KQL Queries
- Performing complex KQL Queries
- Performing People Searches

After completing this module, students will be able to:
- Perform effective Keyword Queries
- Perform effective People Searches
Microsoft SharePoint 2013 End User Level 1
Course#: MS55050

About this Course

This 3-day Instructor-Led course explores all the basic end user features of SharePoint 2013 including all basic lists and sites (aka “Apps”). Learn to assign basic and advanced permissions. Explore the new project and community sites as well as how to work with the new social features of My Sites. Building and sending search queries is also covered.

Audience Profile

Business users and anyone that works with SharePoint sites on a regular basis.

At Course Completion

After completing this course, students will be able to:

- Understand and work with SharePoint Lists, List Management tasks, Permissions and basic SharePoint Foundation sites, My Sites, Newsfeeds and Search queries.

Prerequisites

Before attending this course, students must have basic understanding of websites and SharePoint sites.

Course Outline

Module 1: SharePoint Introduction

In this module, we are going to answer the all important questions of What and Why should we be using SharePoint. We are also going to look at several of the new and exciting features of SharePoint 2013!

Lessons

- What is SharePoint?
- Why SharePoint?
- Whats New in SharePoint 2013?
- Driving End User Adoption

After completing this module, students will be able to:

- Describe the site topology components of SharePoint
- Describe the new features and capabilities of SharePoint 2013 as compared to older versions
- Describe what business problems SharePoint can address

Module 2: Collaboration Experience

In this module we take a look at the site creation process, common features of the basic team site, advanced features of a Team Site and the new features of SharePoint 2013. We will also take a look at the new features introduced in SharePoint 2013 from a collaboration and UI perspective.

Lessons

- Site Structure
- Basic SharePoint Features
- New SharePoint Features

Lab: SharePoint 2013 UI

- Explore 2013 UI Changes

After completing this module, students will be able to:

- Describe the new UI features of SharePoint 2013
- Understand how the Ribbon works
- Understand how to use the new callouts feature

Module 3: Lists

In this module, we are going to take a look at lists from an end user standpoint, but also very quickly from a database standpoint as well. We will talk about all the basic SharePoint Lists and the new lists in SharePoint 2013 and what things have changed when working with any type of list.

Lessons

- Lists
- List Views
- SharePoint 2013 Features
Course Outline

Lab: Document Library
- Create a document library
- Create Documents and Folders
- Explore Callouts
- Uploading Documents
- Explorer View

Lab: Form Library
- Create a Form Library
- Create an InfoPath Form
- Publish a Form

Lab: Wiki Pages
- Create Wiki Page Library
- Add Wiki Pages
- Editing Wiki Pages
- History

Lab: Picture Library
- Create a Picture Library
- Upload Pictures
- Picture Views
- Referencing Pictures

Lab: Report Library
- Create a Report Library
- Create a Report
- Upload a Report
- Run a Report
- Report History

Lab: Data connection Library
- Create a Data Connection Library
- Create/Upload an Office Data Connection (ODC)
- Create/Upload a Universal Data Connection (UDC)

Lab: Asset Library
- Create an Asset Library

Lab: Surveys
- Create a Survey
- Create Questions
- Change question ordering
- Branching Logic
- Fill out the survey
- Anonymous Surveys?

Lab: Custom Lists
- Create a Custom List
- Add one of each column type

Lab: General Lists
- Create an Announcement List

- Create a contact List
- Create a Discussion Board
- Create a Links List
- Create a Calendar
- Create an Issue Tracking List

Lab: Promoted Links
- Creating Promoted Links APP
- Using the Promoted Links APP

Lab: Views
- Creating Views (Standard, DataSheet, Access)
- Adding/Ordering Columns
- Sorting Data
- Filtering Data
- Grouping Data
- Totalling Data
- Setting Style
- Item Limits
- Mobile
- Enabling View
- Datasheet Metadata Editing

Lab: Business Connectivity Services and External Content Types
- Explore External Content Types
- Create a new External Content Type
- Create an External List
- Setup and Configure Permissions for External List
- Add items to an External List

Lab: GeoLocation Field
- Adding a GeoLocation Field

After completing this module, students will be able to:
- Understand when to use a List and when to use a Database
- Create and use the various lists in SharePoint
- Add list columns to tag your content with metadata
- Create Document Sets
- Create External Content Type Lists

Module 4: List Management

We explored the types of lists that come out of the box in the last module. In this module, we will explore how to manage those lists!

Lessons
- Basic List Management
- Advanced List Management

Lab: List Management
- RSS Feeds
- Check out/Check In
- Document/Item Properties
- Site Columns
Module 5: Permissions

In this modile we take a look at SharePoint Permissions. We will learn about SharePoint groups, permission levels, permissions and explore the new Permission Finders.

Lessons
- SharePoint Permissions

Lab: SharePoint Permissions
- Review Default Groups
- Add users to a site
- Requests for access

Module 6: Foundation Site Definitions

In this module we are going to review the SharePoint Foundation site definitions.

Lessons
- Creating Sites
- SharePoint Foundation Sites

Lab: SharePoint Foundation Definitions
- Create Sub Sites (Team Sites)
- Create/Use a Blog Site
- Create/Use a Wiki Site
- Delete a Site
- Restore a Site

Lab: New SharePoint Sites
- Create a Project Site
- Create a Community site
- Work with Badges and Reputation
- Enable Offensive Content Reporting

After completing this module, students will be able to:
- Work with team, blog and wiki sites
- Understand how to create a project and community site.
- Work with a community site (reputation, content moderation, badges, etc)

Module 7: Office Integration

In this module we are going to take a look at how SharePoint and Office interact with each other and how they handle mobile devices.

Lessons
- Web Applications
- Office Integration
Lab: Office Integration
- Outlook offline document libraries
- Viewing calendars
- Syncing tasks
- Viewing contacts
- Excel data reporting
- Access data reporting
- SkyDrive Pro

Lab: Office Web Applications
- Explore Office Web Applications
- Create and edit Word documents in Browser
- Create and edit PowerPoint documents in Browser
- Create and edit OneNote documents in Browser
- Office Web Apps and Search
- Multi-User editing

Lab: Access Services
- Explore Access Services

Lab: Visio Services
- Explore Visio Services

Lab: Site Mailboxes
- Exchange setup
- Creating site mailboxes

Lab: My Tasks
- Understand work management task aggregation
- Explore My Site’s My Tasks
- Exchange Opt-In Task sync

Lab: Site Notebook
- Enable a Site Notebook
- Work with the Site Notebook

Lab: Information Rights Management
- Enable Information rights Management on a Library
- Test IRM

Lab: Machine Translation
- Use Machine Translation in Office Web Apps
- Use Machine Translation in Office Client

After completing this module, students will be able to:
- Describe how SharePoint integrates with Office apps (Outlook, Excel, Access)
- Work offline with documents

- Describe and use Office Web Applications (in browser editing, multi-user editing)
- Use Site Mailboxes and Site Notebooks
- Set up Information Rights Management (IRM)

Module 8: My Site
In this module we will review the new Social Computing features in SharePoint 2013 and how My Sites has been completely redesigned to support social.

Lessons
- My Site
  - What is Social Computing

Lab: My Site
- Create you’re my Site
- Newsfeeds
- Hashtags and Mentions
- Following
- User Profile
- Notification Settings
- Apps
- My Blog
- My Tasks

After completing this module, students will be able to:
- Describe what a My Site is
- Create and modify a My Site
- Work with My Site social networking features (Newsfeeds, Following, Hashtags and Mentions)
- Protect yourself in the Social Computing realm

Module 9: Search
In this module you will learn how to effectively query the Search Index to find items you are looking for.

Lessons
- Performing Queries

Lab: Performing Search Queries
- Performing simple KQL Queries
- Performing complex KQL Queries
- Performing People Searches

After completing this module, students will be able to:
- Perform effective Keyword Queries
- Perform effective People Searches
Microsoft SharePoint 2013 End User Level 2
Course#: 55052

Length: 3 Days
Audience: Information Workers
Level: 300
Technology: Microsoft SharePoint Server 2013
Type: Hands-On Course
Delivery Method: Instructor-led Classroom

About this Course
This 3-day Instructor-Led course explores several advanced topics of working with SharePoint 2013 sites. Topics include SharePoint Server site definitions (Business Intelligence, Document Center, eDiscovery, Education, Search Center, etc), in-depth coverage of Workflows, Site Administration, Site Customization and Site collection Administration.

Audience Profile
This course is intended for people responsible for managing SharePoint sites as Owners or Site Collection Owners. Business and everyday users wanting to learn more advanced tasks of SharePoint sites and site collections.

At Course Completion
After completing this course, students will be able to:

• Explore all the new site admin features exposed in SharePoint 2013. Learn to utilize Workflows, search schemas, site administration, site collection administration and site customization.

Prerequi sites
Before attending this course, students must have previous SharePoint End User Level 1 course or several months of working with SharePoint sites.

Course Outline

Module 1: Server Site Definitions
In this module we will explore each of the site definitions that come with SharePoint Server.

Lessons
• SharePoint Server Site Definitions
• Business Intelligence Center
• Publishing
• SharePoint eDiscovery
• SharePoint Education

Lab: Server Site Definitions
• Use the Publishing Portal
• Edit Publishing pages
• Work with Reusable Content
• Review Page History
• Create new Pages
• Use the Records Center
• Setup Send to Connections
• Create Content Organizer Rules
• Submit Records
• Use the Search Center
• Use Business Intelligence Center

Lab: Managed Navigation
• Managed Navigation

Lab: Cross Site Publishing
• Cross site Publishing

Lab: Image Renditions
• Image Renditions

Lab: Embedded Code
• Embedded Code

Lab: SharePoint eDiscovery
• Create discovery Center
• Create a Case
• Create Discovery Sets
• Create Queries
• Explore eDiscovery Exchange Integration

Lab: SharePoint Education
• Explore the SharePoint Education Course Site
• Create and Assign Assignments
• Create Quizzes
Lab: Content Type Hub
- Configure Content Type Hub
- Configure Content Type Publishing

After completing this module, students will be able to:
- Describe each of the SharePoint Server site definitions
- Effectively use the SharePoint Server site definitions
- Utilize the Publishing site for intranet and internet sites (Create pages, content types, page layouts)
- Use the new cross site publishing (List catalogs), image renditions and code snippet features.
- Use Records Center to submit content
- Implement in-place records management
- Set up and use the eDiscovery Center
- Set up and use the SharePoint Education site

Module 2: Search
In this module you will learn how to navigate the basic Search Center provided by SharePoint 2013. You will then explore various ways to customize the Search Center using Search Pages, Web Parts and Result Types.

Lessons
- Search Center Introduction
- Customizing Search Center

Lab: Search Administration
- Search Result Sources
- Search Result Types
- Search Query Results
- Search Schema
- Search Configuration Export and Import
- Search and Offline Availability
- Searchable columns

Lab: Creating Refiners
- Creating Refiners (Custom)
- Creating Refiners (Managed Metadata)
- Configure item counts

Lab: Content Query Web Part
- Using Content Query Web Part
- Implementing Top Likes
- Implementing Most Viewed

After completing this module, students will be able to:
- Describe the Search Center features
- Enhance the Search experience with Site Collection and Site Search Schemas
- Add new search and results pages
- Customize the Search Center using Search Web Parts
- Create and use Result Types
- Create Refiners
  - Using the Content Search Web Part

Module 3: Workflows
In this module we will review the new workflow features of SharePoint 2013.

Lessons
- Workflows in SharePoint 2013

Lab: Built in Activities (2007)
- Use one of each Built-in Activity

Lab: Built in Activities (2010)
- Use one of each Built-in Activity

Lab: Reusable Workflows
- Create Reusable Workflows (Site/Global)
- Export a workflow to Visio
- Import a workflow from Visio
- Save as Template

Lab: Modify OOB Workflow
- Modify Out Of Box Workflows

Lab: Looping Workflow
- Create a looping set of workflows

Lab: Creating Simple 2013 Workflows
- Create a custom workflow using SharePoint Designer 2013
- Work with Stages
- Work with Loops
- Utilize new SharePoint activities

Lab: Creating Visio-based Workflows
- Create a workflow using Visio 2013

Lab: Out Of Box Workflows
- Create/Use Approval WF
- Create/Use Collect Feedback WF
- Create/Use Collect signatures WF
- Create/Use Disposition WF
- Create/Use Three-state WF

After completing this module, students will be able to:
- Build workflows with SharePoint Designer
- Utilize the new Windows Workflow 4.0 in SharePoint 2013
- Understand how to edit built in workflows
- Implement logging in your workflows
- Understand the difference between 2010 and 2013 workflows
- Use the new Stages to implement state machine workflows.

Module 4: Site Administration
In this module we are going to take a quick look at some basic site administration tasks. These are tasks that can be done by site owners.
## Lessons
- Basic Site Administration

### Lab: Site Administration
- Site Name, Description, Appearance
- Tree View
- Composed Looks and Site Theme
- Navigation
- Regional Settings
- User Alerts
- RSS Settings
- Workflow Settings
- Term store management
- Content and Structure
- Manage Site Features
- Reset to site definition
- Popularity Trends

### Lab: Galleries
- Explore Site Column Gallery
- Explore Site Content types Gallery
- Explore Web Parts Gallery
- Explore List templates Gallery
- Explore Master Pages (and page layouts) Gallery
- Explore Solutions Gallery

### Lab: Advanced Site Administration
- Site Features
- Hold Reports
- Discover and hold content
- Content Organizer settings
- Content Organizer rules

After completing this module, students will be able to:
- Understand what a Site Administrator is
- Describe all Site Administration tasks
- Administer SharePoint Sites

## Module 5: Site Customization

In this module we will take a very brief look at some of the ways to customize your site via the browser and as an end user. There are many more ways at a developer level to customize SharePoint sites, but this module is focused at an end user level.

### Lessons
- Using Web Parts
- Site Customization

### Lab: Foundation Web Parts
- Web Parts Basics
- Add a web part
- Close a web part
- Delete a web part

- Media and Content Web Parts
- Content Rollup Web Parts
- Social Collaboration Web Parts

### Lab: New 2013 Web Parts
- Timeline
- Search-Driven Content Web Parts

### Lab: Server Web Parts
- Basic and Audience Targeting
- Business Data
- Office Client Applications

### Lab: Filter Web Parts
- Use each of the Filter Web Parts

### Lab: Master Page and CSS Customization
- Create a Master Page
- Modify a Master Page
- Custom CSS

### Lab: Page Layouts
- Create a new Page Layout
- Create a new Page using a Page Layout

After completing this module, students will be able to:
- Modify the shared and personal view of a site
- Add, remove, close and move web parts to a web part page
- Understand some basic web part on a team site and portal sites
- Make simple changes to SharePoint master pages and CS
- Create page layouts and pages

### Module 6: Site Collection Administration

In this module we take a look at all site collection settings and describe what a site collection administrator is, and what they can do.

### Lessons
- Site Collection Administration

### Lab: Site Collection Administration
- Recycle Bin
- Site Collection Features
- Site Hierarchy
- Site Collection Navigation
- Site engine optimization settings
- Site Collection Audit settings
- Audit Log Reports
- Portal site connection
- Content Type Policy Templates
- Storage Metrics
- Site collection app permissions
- Site policies
- Site collection cache profiles, object cache and output cache
- Suggested Content Browser Locations
Lab: Creating Variations
- Variation Settings
- Variation Labels
- Variation Logs

Lab: List Throttling
- Throttle Large Lists

After completing this module, students will be able to:
- Understand what a Site Collection Administrator is
- Understand where to find and configure site collection settings
- Describe what each of the site collection administration features are
- Be qualified to be a Site Collection Administrator
About this Course

This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack, and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. Students will begin by understanding how perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed. Students then learn how intruders escalate privileges and what steps can be taken to secure a system. Students will also learn about Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows, and Virus Creation.

Required Exam

CEH Exam 312-50

Audience Profile

This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

At Course Completion

After completing this course, students will have hands on understanding and experience in Ethical Hacking.

Legal Agreement

Ethical Hacking and Countermeasures course mission is to educate, introduce and demonstrate hacking tools for penetration testing purposes only. Prior to attending this course, you will be asked to sign an agreement stating that you will not use the newly acquired skills for illegal or malicious attacks and you will not use such tools in an attempt to compromise any computer system, and to indemnify EC-Council and ATG Learning with respect to the use or misuse of these tools, regardless of intent.

Prerequi sites

- A working knowledge of Linux is strongly recommended
- Strong Microsoft Windows skills and a good understanding of computer networking are required
- CompTIA Security+ and Network+ certification or equivalent knowledge
- At least one year of practical industry experience in networking is strongly recommended

Course Outline

Module 1: Intro To Ethical Hacking

- Internet Crime Current Report: IC3
- Data Breach Investigations Report
- Types of Data Stolen From the Organizations
- Essential Terminologies
- Elements of Information Security
- Authenticity and Non-Repudiation
- The Security, Functionality, and Usability Triangle

- Security Challenges
- Effects of Hacking
- Effects of Hacking on Business
- Who is a Hacker?
- Hacker Classes
- Hacktivism
- What Does a Hacker Do?
- Phase 1 - Reconnaissance
Module 2: Footprinting and Reconnaissance

- Footprinting Terminologies
- What is Footprinting?
- Objectives of Footprinting
- Footprinting Threats
- Finding a Company’s URL
- Locate Internal URLs
- Public and Restricted Websites
- Search for Company’s Information
- Tools to Extract Company’s Data
- Footprinting Through Search Engines
- Collect Location Information
- Satellite Picture of a Residence
- People Search
- People Search Using http://pipl.com
- People Search Online Services
- People Search on Social Networking Services
- Gather Information from Financial Services
- Footprinting Through Job Sites
- Monitoring Target Using Alerts
- Competitive Intelligence Gathering
- Competitive Intelligence-When Did this Company Begin? How Did it Develop?
- Competitive Intelligence-What are the Company’s Plans?
- Competitive Intelligence-What Expert Opinion Say About the Company?
- Competitive Intelligence Tools
- Competitive Intelligence Consulting Companies
- WHOIS Lookup
- WHOIS Lookup Result Analysis

- WHOIS Lookup Tools: SmartWhois
- WHOIS Lookup Tools
- WHOIS Lookup Online Tools
- Extracting DNS Information
- DNS Interrogation Tools
- DNS Interrogation Online Tools
- Locate the Network Range
- Traceroute
- Traceroute Analysis
- Traceroute Tool: 3D Traceroute
- Traceroute Tool: LoriotPro
- Traceroute Tool: Path Analyzer Pro
- Traceroute Tools
- Mirroring Entire Website
- Website Mirroring Tools
- Extract Website Information from http://www.archive.org
- Monitoring Web Updates Using Website Watcher
- Tracking Email Communications
- Email Tracking Tools
- Footprint Using Google Hacking Techniques
- What a Hacker Can Do With Google Hacking?
- Google Advance Search Operators
- Finding Resources using Google Advance Operators
- Google Hacking Tools
- Additional Footprinting Tools
- Footprinting Countermeasures
- Footprinting Pen Testing

Module 3: Scanning Networks

- Network Scanning
- Types of Scanning
- Checking for Live Systems – ICMP Scanning
- Ping Sweep
- Ping Sweep Tools
- Three-Way Handshake
- TCP Communication Flags
- Create Custom Packet using TCP Flags
- Hping2/Hping3
- Hping Commands
- Scanning Techniques
- TCP Connect/Full Open Scan
- Stealth Scan (Half-open Scan)
- Xmas Scan
- FIN Scan
- NULL Scan
- IDLE Scan
- IDLE Scan: Step1
- IDLE Scan: Step 2.1 (Open Port)
- IDLE Scan: Step 2.2 (Closed Port)
- IDLE Scan: Step 3
- ICMP Echo Scanning/List Scan
Module 3: Attack Pen Testing

- SYN/FIN Scanning Using IP Fragments
- UDP Scanning
- Inverse TCP Flag Scanning
- ACK Flag Scanning
- Scanning: IDS Evasion Techniques
- IP Fragmentation Tools
- Scanning Tool: Nmap
- Scanning Tool: NetScan Tools Pro
- Scanning Tools
- Do Not Scan These IP Addresses (Unless you want to get into trouble)
- Scanning Countermeasures
- War Dialing
- Why War Dialing?
- War Dialing Tools
- War Dialing Countermeasures
- War Dialing Countermeasures: SandTrap Tool
- OS Fingerprinting
- Active Banner Grabbing Using Telnet
- Banner Grabbing Tool: ID Serve
- GET REQUESTS
- Banner Grabbing Tool: Netcraft
- Banner Grabbing Tools
- Banner Grabbing Countermeasures: Disabling or Changing Banner
- Hiding File Extensions
- Hiding file Extensions from Webpages
- Vulnerability Scanning
- Vulnerability Scanning Tool: Nessus
- Vulnerability Scanning Tool: SAINT
- Vulnerability Scanning Tool: GFI LANGuard
- Network Vulnerability Scanners
- LANsurveyor
- Network Mappers
- Proxy Servers
- Why Attackers Use Proxy Servers?
- Use of Proxies for Attack
- How Does MultiProxy Work?
- Free Proxy Servers
- Proxy Workbench
- Proxifier Tool: Create Chain of Proxy Servers
- SocksChain
- TOR (The Onion Routing)
- TOR Proxy Chaining Software
- HTTP Tunneling Techniques
- Why do I Need HTTP Tunneling?
- Super Network Tunnel Tool
- Httpunnel for Windows
- Additional HTTP Tunneling Tools
- SSH Tunneling
- SSL Proxy Tool
- How to Run SSL Proxy?

Module 4: Enumeration

- What is Enumeration?
- Techniques for Enumeration
- Netbios Enumeration
- NetBIOS Enumeration Tool: SuperScan
- NetBIOS Enumeration Tool: NetBIOS Enumerator
- Enumerating User Accounts
- Enumerating Systems Using Default Passwords
- SNMP (Simple Network Management Protocol) Enumeration
- Management Information Base (MIB)
- SNMP Enumeration Tool: OpUtilis Networking Monitoring Toolset
- SNMP Enumeration Tool: SolarWinds
- SNMP Enumeration Tools
- UNIX/Linux Enumeration
- Linux Enumeration Tool: Enum4linux
- LDAP Enumeration
- LDAP Enumeration Tool: JXplorer
- LDAP Enumeration Tool:
- NTP Enumeration
- NTP Server Discovery Tool: NTP Server Scanner
- NTP Server: PresentTense Time Server
- NTP Enumeration Tools
- SMTP Enumeration
- SMTP Enumeration Tool: Netscan Tools Pro
- DNS Zone Transfer Enumeration Using nslookup
- DNS Analyzing and Enumeration Tool: The Men & Mice Suite
- Enumeration Countermeasures
- SMB Enumeration Countermeasures
- Enumeration Pen Testing

Module 5: System Hacking

- Information at Hand Before System Hacking Stage
- System Hacking: Goals
- CEH Hacking Methodology (CHM)
Keylogger: Perfect Keylogger
Keylogger: Spytech
Keylogger: Advanced Types
Execute RemoteExec
Alchemy Remote Executing
How to Defend against Privilege Escalation?
Active@ Password Changer
Privilege Escalation Tools
How to Defend against Privilege Escalation?
Executing Applications
Alchemy Remote Executor
RemoteExec
Execute This!
Keylogger
Types of Keystroke Loggers
Acoustic/CAM Keylogger
Keylogger: Advanced Keylogger
Keylogger: Spytech SpyAgent
Keylogger: Perfect Keylogger

Keylogger: Powered Keylogger
Keylogger for Mac: Aobo Mac OS X KeyLogger
Keylogger for Mac: Perfect Keylogger for Mac
Hardware Keylogger: KeyGhost
Keyloggers
Spyware
What Does the Spyware Do?
Types of Spywares
Desktop Spyware
Desktop Spyware: Activity Monitor
Email and Internet Spyware
Email and Internet Spyware: eBLASTER
Internet and E-mail Spyware
Child Monitoring Spyware
Child Monitoring Spyware: Advanced Parental Control
Screen Capturing Spyware
Screen Capturing Spyware: Specter Pro
USB Spyware
USB Spyware: USBDumper
Audio Spyware
Audio Spyware: RoboNanny, Stealth Recorder Pro and Spy Voice Recorder
Video Spyware
Video Spyware: Net Video Spy
Print Spyware
Print Spyware: Printer Activity Monitor
Telephone/Cellphone Spyware
Cellphone Spyware: Mobile Spy
GPS Spyware
GPS Spyware: GPS TrackMaker
How to Defend against Keyloggers?
Anti-Keylogger
Anti-Keylogger: Zemana AntiLogger
Anti-Keyloggers
How to Defend against Spyware?
Anti-Spyware: Spyware Doctor
Rootkits
Types of Rootkits
How Rootkit Works?
Rootkit: Fu
Detecting Rootkits
Steps for Detecting Rootkits
How to Defend against Rootkits?
Anti-Rootkit: RootkitRevealer and McAfee Rootkit Detective
NTFS Data Stream
How to Create NTFS Streams?
NTFS Stream Manipulation
How to Defend against NTFS Streams?
NTFS Stream Detector: ADS Scan Engine
NTFS Stream Detectors
What is Steganography?
Module 6: Trojans and Backdoors

- What is a Trojan?
- Overt and Covert Channels
- Purpose of Trojans
- What Do Trojan Creators Look For?
- Indications of a Trojan Attack
- Common Ports used by Trojans
- How to Infect Systems Using a Trojan?
- Wrappers
- Wrapper Covert Programs
- Different Ways a Trojan can Get into a System
- How to Deploy a Trojan?
- Evading Anti-Virus Techniques
- Types of Trojans
- Command Shell Trojans
- Command Shell Trojan: Netcat
- GUI Trojan: MoSucker
- GUI Trojan: Jumper and Biodox
- Document Trojans
- E-mail Trojans
- E-mail Trojans: RemoteByMail
- Defacement Trojans
- Defacement Trojans: Restorator
- Botnet Trojans
- Botnet Trojan: Illusion Bot
- Botnet Trojan: NetBot Attacker
- Proxy Server Trojans
- Proxy Server Trojan: W3bPrOxy Tr0j4nCr34t0r (Funny Name)
- FTP Trojans
- FTP Trojan: TinyFTPD
- VNC Trojans
- HTTP/HTTPS Trojans
- HTTP Trojan: HTTP RAT
- Shttpd Trojan - HTTPS (SSL)
- ICMP Tunneling
- ICMP Trojan: icmpsend
- Remote Access Trojans
- Remote Access Trojan: RAT DarkComet
- Remote Access Trojan: Apocaypse
- Covert Channel Trojan: CCTT
- E-banking Trojans
- Banking Trojan Analysis
- E-banking Trojan: ZeuS
- Destructive Trojans
- Notification Trojans
- Credit Card Trojans
- Data Hiding Trojans (Encrypted Trojans)
- BlackBerry Trojan: PhoneSnoop
- MAC OS X Trojan: DNSchanger
- MAC OS X Trojan: DNSChanger
- Mac OS X Trojan: Hell Raiser
- How to Detect Trojans?
- Scanning for Suspicious Ports
- Port Monitoring Tool: IceSword
- Port Monitoring Tools: CurrPorts and TCPView
- Scanning for Suspicious Processes
- Process Monitoring Tool: What's Running
- Process Monitoring Tools
- Scanning for Suspicious Registry Entries
- Registry Entry Monitoring Tools
- Scanning for Suspicious Device Drivers
- Device Drivers Monitoring Tools: DriverView
- Device Drivers Monitoring Tools
- Scanning for Suspicious Windows Services
- Windows Services Monitoring Tools: Windows Service Manager (SvMan)
- Windows Services Monitoring Tools
- Scanning for Suspicious Startup Programs
- Windows7 Startup Registry Entries
- Startup Programs Monitoring Tools: Starter
- Startup Programs Monitoring Tools: Security AutoRun
- Startup Programs Monitoring Tools
- Scanning for Suspicious Files and Folders
- Files and Folder Integrity Checker: FastSum and WinMD5
- Files and Folder Integrity Checker
- Scanning for Suspicious Network Activities
- Detecting Trojans and Worms with Capsa NetworkAnalyzer
• Trojan Countermeasures
• Backdoor Countermeasures
• Trojan Horse Construction Kit
• Anti-Trojan Software: TrojanHunter
• Anti-Trojan Software: Emsisoft Anti-Malware
• Anti-Trojan Softwares
• Pen Testing for Trojans and Backdoors

Module 7: Viruses and Worms
• Introduction to Viruses
• Virus and Worm Statistics 2010
• Stages of Virus Life
• Working of Viruses: Infection Phase
• Why Do People Create Computer Viruses?
• Indications of Virus Attack
• How does a Computer get infected by Viruses?
• Virus Hoaxes
• Virus Analysis:
  • W32/Sality AA
  • W32/Toal-A
  • W32/Virut
  • Klez
• Types of Viruses
• System or Boot Sector Viruses
• File and Multipartite Viruses
• Macro Viruses
• Cluster Viruses
• Stealth/Tunneling Viruses
• Encryption Viruses
• Polymorphic Code
• Metamorphic Viruses
• File Overwriting or Cavity Viruses
• Sparse Infector Viruses
• Companion/Camouflage Viruses
• Shell Viruses
• File Extension Viruses
• Add-on and Intrusive Viruses
• Transient and Terminate and Stay Resident Viruses
• Writing a Simple Virus Program
• Terabit Virus Maker
• JPS Virus Maker
• DELmE's Batch Virus Maker
• Computer Worms
• How is a Worm Different from a Virus?
• Example of Worm Infection: Conficker Worm
• Why Do People Create Computer Viruses?
• Worm Analysis:
  • W32/Netsky
  • W32/Bagle.GE

• Worm Maker: Internet Worm Maker Thing
• What is Sheep Dip Computer?
• Anti-Virus Sensors Systems
• Malware Analysis Procedure
• String Extracting Tool: Bintext
• Compression and Decompression Tool: UPX
• Process Monitoring Tools: Process Monitor
• Log Packet Content Monitoring Tools: NetResident
• Debugging Tool: Ollydbg
• Virus Analysis Tool: IDA Pro
• Online Malware Testing:
  • Sunbelt CWsandbox
• VirusTotal
• Online Malware Analysis Services
• Virus Detection Methods
• Virus and Worms Countermeasures
• Companion Antivirus: Immunet Protect
• Anti-virus Tools
• Penetration Testing for Virus

Module 8: Sniffers
• Lawful Intercept
• Benefits of Lawful Intercept
• Network Components Used for Lawful Intercept
• Wiretapping
• Sniffing Threats
• How a Sniffer Works?
• Hacker Attacking a Switch
• Types of Sniffing: Passive Sniffing
• Types of Sniffing: Active Sniffing
• Protocols Vulnerable to Sniffing
• Tie to Data Link Layer in OSI Model
• Hardware Protocol Analyzers
• SPAN Port
• MAC Flooding
• MAC Address/CAM Table
• How CAM Works?
• What Happens When CAM Table is Full?
• Mac Flooding Switches with macof
• MAC Flooding Tool: Yersinia
• How to Defend against MAC Attacks?
• How DHCP Works?
• DHCP Request/Reply Messages
• IPv4 DHCP Packet Format
• DHCP Starvation Attack
• Rogue DHCP Server Attack
• DHCP Starvation Attack Tool: Gobbler
• How to Defend Against DHCP Starvation and Rogue Server Attack?
• What is Address Resolution Protocol (ARP)?
• ARP Spoofing Attack
• How Does ARP Spoofing Work?
Module 9: Social Engineering

- What is Social Engineering?
- Behaviors Vulnerable to Attacks
- Factors that Make Companies Vulnerable to Attacks
- Why is Social Engineering Effective?
- Warning Signs of an Attack
- Phases in a Social Engineering Attack
- Impact on the Organization
- Command Injection Attacks
- Common Targets of Social Engineering

- Threats of ARP Poisoning
- ARP Poisoning Tool: Cain and Abel
- ARP Poisoning Tool: WinArpAttacker
- ARP Poisoning Tool: Ufasoft Snif
- How to Defend Against ARP Poisoning? Use DHCP Snooping Binding Table and Dynamic ARP Inspection
- Configuring DHCP Snooping and Dynamic ARP Inspection on Cisco Switches
- MAC Spoofing/Duplicating
- Sniffing Tool: Wireshark
- MAC Spoofing Tool: SMAC
- How to Defend Against MAC Spoofing? Use DHCP Snooping Binding Table, Dynamic ARP Inspection and IP Source Guard

- DNS Poisoning Techniques
- Intranet DNS Spoofing
- Internet DNS Spoofing
- Proxy Server DNS Poisoning
- DNS Cache Poisoning
- How to Defend Against DNS Spoofing?
- Sniffing Tool: Wireshark
- TCP/IP Sniffer: NetworkView
- Discovery Tool: The Dude Sniffer
- Password Sniffing Tool: Ace
- Packet Sniffing Tool: Capsa Network Analyzer
- OmniPeek Network Analyzer
- Network Packet Analyzer: Observer
- Session Capture Sniffer: NetWitness
- Email Message Sniffer: Big-Mother
- TCP/IP Packet Crafter: Packet Builder
- Additional Sniffing Tools
- How an Attacker Hacks the Network Using Sniffers?
- How to Defend Against Sniffing?
- Sniffing Prevention Techniques
- How to Detect Sniffing?
- Promiscuous Detection Tool: PromisUI
- Promiscuous Detection Tool: PromiScan

Module 10: Denial of Service

- What is a Denial of Service Attack?
- What is Distributed Denial of Service Attacks?
- How Distributed Denial of Service Attacks Work?
- Symptoms of a DoS Attack
- Cyber Criminals
- Organized Cyber Crime: Organizational Chart
- Internet Chat Query (ICQ)
- Internet Relay Chat (IRC)
- DoS Attack Techniques
- Bandwidth Attacks
- Service Request Floods
Module 11: Session Hijacking

- What is Session Hijacking?
- Dangers posed by Hijacking
- Why Session Hijacking is Successful?
- Key Session Hijacking Techniques
- Brute Forcing
- Brute Forcing Attack
- HTTP Referrer Attack
- Spoofing vs. Hijacking
- Session Hijacking Process
- Packet Analysis of a Local Session Hijack
- Types of Session Hijacking

Module 12: Hijacking Webservers

- Webserver Market Shares
- Open Source Webserver Architecture
- IIS Webserver Architecture
- Website Defacement
- Case Study
- Why Web Servers are Compromised?
- Impact of Webserver Attacks
- Webserver Misconfiguration
- Example
Module 13: Hacking Web Applications

- Introduction to Web Applications
- Web Application Components
- How Web Applications Work?
- Web Application Architecture
- Web 2.0 Applications
- Vulnerability Stack
- Web Attack Vectors
- Web Application Threats - 1
- Web Application Threats - 2
- Unvalidated Input
- Parameter/Form Tampering
- Directory Traversal
- Security Misconfiguration
- Injection Flaws
- SQL Injection Attacks
- Command Injection Attacks
- Command Injection Example
- File Injection Attack
- What is LDAP Injection?
- How LDAP Injection Works?
- Hidden Field Manipulation Attack
- Cross-Site Scripting (XSS) Attacks
- How XSS Attacks Work?
- Cross-Site Scripting Attack Scenario: Attack via Email
- XSS Example: Attack via Email
- XSS Example: Stealing Users’ Cookies
- XSS Example: Sending an Unauthorized Request
- XSS Attack in Blog Posting
- XSS Attack in Comment Field
- XSS Cheat Sheet
- Cross-Site Request Forgery (CSRF) Attack
- How CSRF Attacks Work?
- Web Application Denial-of-Service (DoS) Attack
- Denial of Service (DoS) Examples
- Buffer Overflow Attacks
- Cookie/Session Poisoning
- How Cookie Poisoning Works?
- Session Fixation Attack
- Insufficient Transport Layer Protection
- Improper Error Handling
- Insecure Cryptographic Storage
- Broken Authentication and Session Management
- Unvalidated Redirects and Forwards
- Web Services Architecture
- Web Services Attack
- Web Services Footprinting Attack
- Web Services XML Poisoning
- Footprint Web Infrastructure
- Footprint Web Infrastructure: Server Discovery
- Footprint Web Infrastructure: Server Identification/Banner Grabbing
- Footprint Web Infrastructure: Hidden Content Discovery

- Directory Traversal Attacks
- HTTP Response Splitting Attack
- Web Cache Poisoning Attack
- HTTP Response Hijacking
- SSH Brute-force Attack
- Man-in-the-Middle Attack
- Webserver Password Cracking
- Webserver Password Cracking Techniques
- Web Application Attacks
- Webserver Attack Methodology
- Information Gathering
- Webserver Footprinting
- Webserver Footprinting Tools
- Mirroring a Website
- Vulnerability Scanning
- Session Hijacking
- Hacking Web Passwords
- Webserver Attack Tools
- Metasploit
- Metasploit Architecture
- Metasploit Exploit Module
- Metasploit Payload Module
- Metasploit Auxiliary Module
- Metasploit NOPS Module
- Wfeth
- Web Password Cracking Tool
- Brutus
- THC-Hydra
- Countermeasures
- Patches and Updates
- Protocols
- Accounts
- Files and Directories
- How to Defend Against Web Server Attacks?
- How to Defend against HTTP Response Splitting and Web Cache Poisoning?
- Patches and Hotfixes
- What is Patch Management?
- Identifying Appropriate Sources for Updates and Patches
- Installation of a Patch
- Patch Management Tool: Microsoft Baseline Security Analyzer (MBSA)
- Patch Management Tools
- Web Application Security Scanner: Sandcat
- Web Server Security Scanner: Wikto
- Webserver Malware Infection Monitoring Tool: HackAlert
- Webserver Security Tools
- Web Server Penetration Testing

Module 13: Hacking Web Applications

- Web Application Security Statistics
• Web Spidering Using Burp Suite
• Hacking Web Servers
• Web Server Hacking Tool: WebInspect
• Analyze Web Applications
• Analyze Web Applications: Identify Entry Points for User Input
• Analyze Web Applications: Identify Server-Side Technologies
• Analyze Web Applications: Identify Server-Side Functionality
• Analyze Web Applications: Map the Attack Surface
• Attack Authentication Mechanism
• Username Enumeration
• Password Attacks: Password Functionality Exploits
• Password Attacks: Password Guessing
• Password Attacks: Brute-forcing
• Session Attacks: Session ID Prediction/Brute-forcing
• Cookie Exploitation: Cookie Poisoning
• Authorization Attack
• HTTP Request Tampering
• Authorization Attack: Cookie Parameter Tampering
• Session Management Attack
• Attacking Session Token Generation Mechanism
• Attacking Session Tokens Handling Mechanism: Session Token Sniffing
• Injection Attacks
• Attack Data Connectivity
• Connection String Injection
• Connection String Parameter Pollution (CSPP) Attacks
• Connection Pool DoS
• Attack Web App Client
• Attack Web Services
• Web Services Probing Attacks
• Web Service Attacks: SOAP Injection
• Web Service Attacks: XML Injection
• Web Services Parsing Attacks
• Web Application Attack Tool: soapUI
• Web Service Attack Tool: XMLSpy
• Web Application Hacking Tool: Burp Suite Professional
• Web Application Hacking Tools: CookieDigger
• Web Application Hacking Tools: WebScarab
• Web Application Hacking Tools
• Encoding Schemes
• How to Defend Against SQL Injection Attacks?
• How to Defend Against Command Injection Flaws?
• How to Defend Against XSS Attacks?
• How to Defend Against DoS Attack?
• How to Defend Against Web Services Attack?
• Web Application Countermeasures
• How to Defend Against Web Application Attacks?
• Web Application Security Tool: Acunetix Web Vulnerability Scanner
• Web Application Security Tool: Falcove Web Vulnerability Scanner
• Web Application Security Scanner: Netsparker

• Web Application Security Tool: N-Stalker Web Application Security Scanner
• Web Application Security Tools
• Web Application Firewall: dotDefender
• Web Application Firewall: IBM AppScan
• Web Application Firewall: ServerDefender VP
• Web Application Firewall
• Web Application Pen Testing
• Information Gathering
• Configuration Management Testing
• Authentication Testing
• Session Management Testing
• Authorization Testing
• Data Validation Testing
• Denial of Service Testing
• Web Services Testing
• AJAX Testing

Module 14: SQL Injection

• SQL Injection is the Most Prevalent Vulnerability in 2010
• SQL Injection Threats
• What is SQL Injection?
• SQL Injection Attacks
• How Web Applications Work?
• Server Side Technologies
• HTTP Post Request
• Example 1: Normal SQL Query
• Example 1: SQL Injection Query
• Example 1: Code Analysis
• Example 2: BadProductList.aspx
• Example 2: Attack Analysis
• Example 3: Updating Table
• Example 4: Adding New Records
• Example 5: Identifying the Table Name
• Example 6: Deleting a Table
• SQL Injection Detection
• SQL Injection Error Messages
• SQL Injection Attack Characters
• Additional Methods to Detect SQL Injection
• SQL Injection Black Box Pen Testing
• Testing for SQL Injection
• Types of SQL Injection
• Simple SQL Injection Attack
• Union SQL Injection Example
• SQL Injection Error Based
• What is Blind SQL Injection?
• No Error Messages Returned
• Blind SQL Injection: WAITFOR DELAY YES or NO Response
• Blind SQL Injection - Exploitation (MySQL)
• Blind SQL Injection - Extract Database User
• Blind SQL Injection - Extract Database Name
Module 15: Hacking Wireless Networks

- Wireless Networks
- Wi-Fi Usage Statistics in the US
- Wi-Fi Hotspots at Public Places
- Wi-Fi Networks at Home
- Types of Wireless Networks
- Wireless Standards
- Service Set Identifier (SSID)
- Wi-Fi Authentication Modes

- Wi-Fi Authentication Process Using a Centralized Authentication Server
- Wi-Fi Authentication Process
- Wireless Terminologies
- Wi-Fi Chalking
- Wi-Fi Chalking Symbols
- Wi-Fi Hotspot Finder: jiwire.com
- Wi-Fi Hotspot Finder: WeFi.com
- Types of Wireless Antenna
- Parabolic Grid Antenna
- Types of Wireless Encryption
- WEP Encryption
- How WEP Works?
- What is WPA?
- How WPA Works?
- Temporal Keys
- What is WPA2?
- How WPA2 Works?
- WEP vs. WPA vs. WPA2
- WEP Issues
- Weak Initialization Vectors (IV)
- How to Break WEP Encryption?
- How to Break WPA/WPA2 Encryption?
- How to Defend Against WPA/WPA2 Cracking?
- Wireless Threats: Access Control Attacks
- Wireless Threats: Integrity Attacks
- Wireless Threats: Confidentiality Attacks
- Wireless Threats: Availability Attacks
- Wireless Threats: Authentication Attacks
- Rogue Access Point Attack
- Client Mis-association
- Misconfigured Access Point Attack
- Unauthorized Association
- Ad Hoc Connection Attack
- HoneySpot Access Point Attack
- AP MAC Spoofing
- Denial-of-Service Attack
- Jamming Signal Attack
- Wi-Fi Jamming Devices
- Wireless Hacking Methodology
- Find Wi-Fi Networks to Attack
- Attackers Scanning for Wi-Fi Networks
- Footprint the Wireless Network
- Wi-Fi Discovery Tool: inSSIDer
- Wi-Fi Discovery Tool: NetSurveyor
- Wi-Fi Discovery Tool: NetStumbler
- Wi-Fi Discovery Tool: Vistumbler
- Wi-Fi Discovery Tool: WirelessMon
- Wi-Fi Discovery Tools
- GPS Mapping
- GPS Mapping Tool: WIGLE
• GPS Mapping Tool: Skyhook
• How to Discover Wi-Fi Network Using Wardriving?
• Wireless Traffic Analysis
• Wireless Cards and Chipsets
• Wi-Fi USB Dongle: AirPcap
• Wi-Fi Packet Sniffer: Wireshark with AirPcap
• Wi-Fi Packet Sniffer: Wi-Fi Pilot
• Wi-Fi Packet Sniffer: OmniPeek
• Wi-Fi Packet Sniffer: CommView for Wi-Fi
• What is Spectrum Analysis?
• Wireless Sniffers
• Aircrack-ng Suite
• How to Reveal Hidden SSIDs
• Fragmentation Attack
• How to Launch MAC Spoofing Attack?
• Denial of Service: Deauthentication and Disassociation Attacks
• Man-in-the-Middle Attack
• MITM Attack Using Aircrack-ng
• Wireless ARP Poisoning Attack
• Rogue Access Point
• Evil Twin
• How to Set Up a Fake Hotspot (Evil Twin)?
• How to Crack WEP Using Aircrack?
• How to Crack WEP Using Aircrack? Screenshot 1/2
• How to Crack WEP Using Aircrack? Screenshot 2/2
• How to Crack WPA-PSK Using Aircrack?
• WPA Cracking Tool: KisMAC
• WEP Cracking Using Cain & Abel
• WPA Brute Forcing Using Cain & Abel
• WPA Cracking Tool: Elcomsoft Wireless Security Auditor
• WEP/WPA Cracking Tools
• Wi-Fi Sniffer: Kismet
• Wardriving Tools
• RF Monitoring Tools
• Wi-Fi Connection Manager Tools
• Wi-Fi Traffic Analyzer Tools
• Wi-Fi Raw Packet Capturing Tools
• Wi-Fi Spectrum Analyzing Tools
• Bluetooth Hacking
• Bluetooth Stack
• Bluetooth Threats
• How to BlueJack a Victim?
• Bluetooth Hacking Tool: Super Bluetooth Hack
• Bluetooth Hacking Tool: PhoneSnoop
• Bluetooth Hacking Tool: BlueScanner
• Bluetooth Hacking Tools
• How to Defend Against Bluetooth Hacking?
• How to Detect and Block Rogue AP?
• Wireless Security Layers
• How to Defend Against Wireless Attacks?
• Wireless Intrusion Prevention Systems

• Wireless IPS Deployment
• Wi-Fi Security Auditing Tool: AirMagnet WiFi Analyzer
• Wi-Fi Security Auditing Tool: AirDefense
• Wi-Fi Security Auditing Tool: Adaptive Wireless IPS
• Wi-Fi Security Auditing Tool: Aruba RFProtect WIPS
• Wi-Fi Intrusion Prevention System
• Wi-Fi Predictive Planning Tools
• Wi-Fi Vulnerability Scanning Tools
• Wireless Penetration Testing
• Wireless Penetration Testing Framework
• Wi-Fi Pen Testing Framework
• Pen Testing LEAP Encrypted WLAN
• Pen Testing WPAA/PA2 Encrypted WLAN
• Pen Testing WEP Encrypted WLAN
• Pen Testing Unencrypted WLAN

Module 16: Evading IDS, Firewalls, and Honeypots

• Intrusion Detection Systems (IDS) and its Placement
• How IDS Works?
• Ways to Detect an Intrusion
• Types of Intrusion Detection Systems
• System Integrity Verifiers (SIV)
• General Indications of Intrusions
• General Indications of System Intrusions
• Firewall
• Firewall Architecture
• DeMilitarized Zone (DMZ)
• Types of Firewall
• Packet Filtering Firewall
• Circuit-Level Gateway Firewall
• Application-Level Firewall
• Stateful Multilayer Inspection Firewall
• Firewall Identification
• Port Scanning
• Firewalking
• Banner Grabbing
• Honeypot
• Types of Honeypots
• How to Set Up a Honeypot?
• Intrusion Detection Tool
• Snort
• Snort Rules
• Rule Actions and IP Protocols
• The Direction Operator and IP Addresses
• Port Numbers
• Intrusion Detection Systems: Tipping Point
• Intrusion Detection Tools
• Firewall: Sunbelt Personal Firewall
• Firewalls
• Honeypot Tools
• KFSensor
Module 18: Cryptography

- Cryptography
- Types of Cryptography
- Government Access to Keys (GAK)
- Ciphers
- Advanced Encryption Standard (AES)
- Data Encryption Standard (DES)
- RC4, RC5, RC6 Algorithms
- The DSA and Related Signature Schemes
- RSA (Rivest Shamir Adleman)
- Example of RSA Algorithm
- The RSA Signature Scheme
- Message Digest (One-way Hash) Functions
- Message Digest Function: MD5
- Secure Hashing Algorithm (SHA)
- What is SSH (Secure Shell)?
- MD5 Hash Calculators: HashCalc, MD5 Calculator and HashMyFiles

Module 17: Buffer Overflow

- Buffer Overflows
- Why are Programs And Applications Vulnerable?
- Understanding Stacks
- Stack-Based Buffer Overflow
- Understanding Heap
- Heap-Based Buffer Overflow
- Stack Operations

- Shellcode
- No Operations (NOPs)
- Knowledge Required to Program Buffer Overflow Exploits
- Buffer Overflow Steps
- Attacking a Real Program
- Format String Problem
- Overflow using Format String
- Smashing the Stack
- Once the Stack is Smashed...
- Simple Uncontrolled Overflow
- Simple Buffer Overflow in C
- Code Analysis
- Exploiting Semantic Comments in C (Annotations)
- How to Mutate a Buffer Overflow Exploit?
- Identifying Buffer Overflows
- How to Detect Buffer Overflows in a Program?
- BOU (Buffer Overflow Utility)
- Testing for Heap Overflow Conditions: heap.exe
- Steps for Testing for Stack Overflow in OllyDbg Debugger
- Testing for Stack Overflow in OllyDbg Debugger
- Testing for Format String Conditions using IDA Pro
- BoF Detection Tools
- Defense Against Buffer Overflows
- Preventing BoF Attacks
- Programming Countermeasures
- Data Execution Prevention (DEP)
- Enhanced Mitigation Experience Toolkit (EMET)
- EMET System Configuration Settings
- EMET Application Configuration Window
- /GS http://microsoft.com
- BoF Security Tools
- BufferShield
- Buffer Overflow Penetration Testing

Module 17: Buffer Overflow

- Buffer Overflows
- Why are Programs And Applications Vulnerable?
- Understanding Stacks
- Stack-Based Buffer Overflow
- Understanding Heap
- Heap-Based Buffer Overflow
- Stack Operations
- Cryptography Tool: Advanced Encryption Package
- Cryptography Tools
- Public Key Infrastructure (PKI)
- Certification Authorities
- Digital Signature
- SSL (Secure Sockets Layer)
- Transport Layer Security (TLS)
- Disk Encryption
- Disk Encryption Tool: TrueCrypt
- Disk Encryption Tools
- Cryptography Attacks
- Code Breaking Methodologies
- Brute-Force Attack
- Meet-in-the-Middle Attack on Digital Signature Schemes
- Cryptanalysis Tool: CrypTool
- Cryptanalysis Tools
- Online MD5 Decryption Tool

**Module 19: Penetration Testing**

- Introduction to Penetration Testing
- Security Assessments
- Vulnerability Assessment
- Limitations of Vulnerability Assessment
- Penetration Testing
- Why Penetration Testing?
- What Should be Tested?
- What Makes a Good Penetration Test?
- ROI on Penetration Testing
- Testing Points
- Testing Locations
- Types of Penetration Testing
- External Penetration Testing
- Internal Security Assessment
- Black-box Penetration Testing
- Grey-box Penetration Testing
- White-box Penetration Testing
- Announced / Unannounced Testing
- Automated Testing
- Manual Testing
- Common Penetration Testing Techniques
- Using DNS Domain Name and IP Address Information
- Enumerating Information about Hosts on Publicly-Available Networks

- Phases of Penetration Testing
- Pre-Attack Phase
- Attack Phase
- Activity: Perimeter Testing
- Enumerating Devices
- Activity: Acquiring Target
- Activity: Escalating Privileges
- Activity: Execute, Implant, and Retract
- Post-Attack Phase and Activities
- Penetration Testing Deliverable Templates
- Penetration Testing Methodology
- Application Security Assessment
- Web Application Testing - I
- Web Application Testing - II
- Web Application Testing - III
- Network Security Assessment
- Wireless/Remote Access Assessment
- Wireless Testing
- Telephony Security Assessment
- Social Engineering
- Testing Network-Filtering Devices
- Denial of Service Emulation
- Outsourcing Penetration Testing Services
- Terms of Engagement
- Project Scope
- PenTest Service Level Agreements
- Penetration Testing Consultants
- Evaluating Different Types of Pentest Tools
- Application Security Assessment Tool
- Webscarab
- Network Security Assessment Tool
- Angry IP scanner
- GFI LANguard
- Wireless/Remote Access Assessment Tool
- Kismet
- Telephony Security Assessment Tool
- Omnippeek
- Testing Network-Filtering Device Tool
- Traffic IQ Professional
About this Course

This intense hands-on training course empowers participants with the networking technologies that are required in today’s IT and Telecom environments. In addition to LAN/WAN topics, the course covers routing and network construction and fully prepares participants for the Cisco CCNA/CCENT (Certified Cisco Network Associate/Cisco Certified Networking Technician, 2 separate exams.)

Prerequisites

Network+ or equivalent networking experience in the I.T. industry.

Course Outline

Module 1: Building a Simple Network (ICND1)
- Exploring the Functions of Networking
- Securing the Network
- Host-to-Host Communication Model
- TCP/IP's Internet Layer
- TCP/IP's Transport Layer
- Packet Delivery Process
- Understanding Ethernet
- Connecting to an Ethernet LAN

Module 2: Ethernet LANs (ICND1)
- Challenges of Shared LANs
- Solving Network Challenges with Switched LAN Technology
- Packet Delivery Process
- Operating Cisco IOS Software
- Starting the Switch
- Understanding Switch Security
- Maximizing the Benefits of Switching
- Troubleshooting Switch Issues

Module 3: Wireless Local Area Networks (WLANs) (ICND1)
- Exploring Wireless Networking
- Understanding WLAN Security
- Implementing a WLAN

Module 4: LAN Connections (ICND1)
- Functions of Routing
- Understanding Binary Basics
- Constructing a Network Addressing Scheme
- Starting a Router
- Configuring a Router
- Packet Delivery Process
- Understanding Router Security
- Using Cisco Router and Security Device Manager
- Using a Router as a DHCP Server
- Accessing Remote Devices

Module 5: Network Environment Management (ICND1)
- Discovering Neighbors on the Network
- Managing Router Startup and Configuration
- Managing Cisco Devices

Module 6: Small Network Implementation (ICND2)
- Review Lab: Review of a Small Network Environment

Module 7: Medium-Sized Switched Network Construction (ICND2)
- Implementing VLANs and Trunks
- Improving Performance with Spanning Tree
- Routing Between VLANs
- Securing the Expanded Network
- Troubleshooting Switched Networks

Module 8: Wide Area Networks (WANs) (ICND1)
- WAN Technologies
- Enabling the Internet Connection
- Enabling Static Routing
- Configuring Serial Encapsulation
- Enabling Routing Information Protocol (RIP)

Module 9: LAN Extension into a WAN (ICND2)
- Establishing a Point-to-Point WAN Connection with PPP
- Establishing a WAN Connection with Frame Relay
- Troubleshooting Frame Relay WANs
- Introducing VPN Solutions
Module 10: Medium-Sized Routed Network Construction (ICND2)

- Reviewing Routing Operations
- Implementing VLSM

Module 11: Single Area OSPF Implementation (ICND2)

- Implementing OSPF
- Troubleshooting OSPF

Module 12: EIGRP Implementation (ICND2)

- Implementing EIGRP
- Troubleshooting EIGRP

Module 13: Access Control Lists (ACLs) (ICND2)

- Introducing ACL Operation
- Configuring and Troubleshooting ACLs

Module 14: Address Space Management (ICND2)

- Scaling the Network with NAT and PAT
- Transitioning to IPv6
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking.

This primary goal of this course is to help each student pass the exams required to earn the A+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+ certification, students must pass two exams:

- **220-801: A+ IT Essentials**
- **220-802: A+ Practical Application**

While both exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification:

- **220-801: A+ IT Essentials**
- **220-802: A+ Practical Application**

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure and troubleshoot networking
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components

- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

Section 2: Storage Devices, Power Supplies, and Adapters

- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
  - AC Adapters as Power Supplies
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch

Section 3: Understanding Display Devices

- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Section 4: Understanding Laptops and Portable Devices

- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Section 5: Installing and Configuring Printers

- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
  - Printer Interfaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Section 6: Operating System Features and Interfaces

- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What’s in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
Section 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
  - Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Section 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
Applying Proper Safety and Disposal Procedures
- Preventing Electrostatic Discharge
- Preventing Electromagnetic Interference
- Working in a Safe Environment
- Handling Equipment
- Following Disposal Procedures

Demonstrating Communication Skills and Professionalism
- Communicating with Customers

- Using Appropriate Behavior
- Putting It All in Perspective

Section 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components

- Using Tools and Diagnostic Procedures for Personal Computer Components
  - Understanding Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Section 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems

- Performing Preventive Maintenance
  - Performing Scheduled Maintenance
  - Using Cleaning Solutions
  - Ensuring a Suitable Environment
  - Using Recommended Supplies
  - Installing Printer Upgrades

Section 16: Operating System Structures and Commands
- Using Operating Systems
  - Using the Command Prompt
    - Understanding and Navigating Directory Structures
  - User File Locations
  - System File Locations
  - Font Files
    - Managing Temporary Files
  - Program Files
    - Offline Files
      - Windows Vista
      - Windows XP
      - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues
- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points

- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.irr Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions

- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting

- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance

- System Performance and Optimization
  - Common Operational Problems
Section 18: Installing and Troubleshooting Networks
- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Section 19: System Security
- Security Basics
-Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
  - TCP Attacks
- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools
- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting
- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
  - General Rules for the Exam on Access Control
**About this Course**

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

**Required Exams**

To earn the CompTIA A+, Network+, and Security+ certifications, students must pass three exams:

- **220-801**: A+ IT Essentials
- **220-802**: A+ Practical Application
- **N10-005**: Network+
- **SY0-004**: Security+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

**Audience Profile**

This course is intended for students seeking to earn the CompTIA A+, Network+, and Security+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

**At Course Completion**

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ certification and the single exam required for Security+ certification:

- **220-801**: A+ IT Essentials
- **220-802**: A+ Practical Application
- **N10-005**: Network+
- **SY0-004**: Security+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
Prerequisites

Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components

Section 2: Storage Devices, Power Supplies, and Adapters

Section 3: Understanding Display Devices

Section 4: Understanding Laptops and Portable Devices

Section 5: Installing and Configuring Printers

Section 6: Operating System Features and Interfaces

Section 7: Installing and Configuring Operating Systems

Section 8: Troubleshooting Theory and Preventive Maintenance

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops

Section 10: Understanding Networking

Section 11: Understanding Network Security Fundamentals

Section 12: Understanding Operational Procedures

Section 13: Installing, Maintaining, and Troubleshooting Hardware

Section 14: Installing, Configuring, and Troubleshooting Laptops

Section 15: Resolving Printer Problems

Section 16: Operating System Structures and Commands

Section 17: Operating System Utilities and Troubleshooting Issues

Section 18: Installing and Troubleshooting Networks

Section 19: System Security

Section 20 Network Technologies

Section 21 Network Media and Topologies

Section 22 Network Devices

Section 23 Network Management

Section 24 Network Tools

Section 25 Network Security

Section 26 Compliance and Operational Security

Section 27 Threats and Vulnerabilities

Section 28 Application, Data and Host Security

Section 29 Access Control and Identity Management

Section 30 Cryptography
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

This primary goal of this course is to help each student pass the exams required to earn the Security+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA Security+ certification, students must pass exam SY0-301.

Audience Profile

This course is intended for students seeking to earn the CompTIA Security+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed exam SY0-301 required for the CompTIA Security+ certification. In addition, students will be able to:

- Understand and implement network security
- Manage compliance and operational security
- Identify various threats and vulnerabilities
- Implement application, data and host security
- Manage access control and identity management
- Understand and implement cryptography

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Module 1 - Measuring and Weighing Risk

- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
  - Risks Associated with Cloud Computing
  - Risks Associated with Virtualization

- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
  - Business Policies
  - Understanding Control Types, False Positives, and Change and Incident Management

Module 2 - Infrastructure and Connectivity

- Mastering TCP/IP 9
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
Module 3 - Protecting Networks

- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems
- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots
- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol
- Understanding Network Protocols

Module 4 - Threats and Vulnerabilities

- Understanding Encapsulation
- Working with Protocols and Services
- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements
- Understanding Infrastructure Security
  - Working with Hardware Components
  - Working with Software Components
- Understanding the Different Network Infrastructure Devices
  - Firewalls
  - Hubs
  - Modems
  - Remote Access Services
  - Routers
  - Switches
  - Load Balancers
  - Telecom/PBX Systems
  - Virtual Private Networks
  - Web Security Gateway
  - Spam Filters
- Understanding Remote Access
  - Using Point-to-Point Protocol
  - Working with Tunneling Protocols

Module 5 - Access Control and Identity Management

- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider
- Understanding Remote Access Connectivity
  - Using the Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Working with RADIUS
  - TACACS/TACACS+/XTACACS
  - VLAN Management
- Understanding Authentication Services
  - LDAP
  - Kerberos
  - Single Sign-On Initiatives
- Understanding Access Control
  - Mandatory Access Control
  - Discretionary Access Control
  - Role-Based Access Control
  - Rule-Based Access Control
- Implementing Access Control Best Practices
  - Smart Cards
  - Access Control Lists
  - Trusted OS
  - Secure Router Configuration

Module 6 - Educating and Protecting the User

- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness
Module 7 - Operating System and Application Security

- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
  - SQL Injection
  - LDAP Injection
  - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Antimalware
    - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Malware Inspection
  - Data Loss Prevention
  - Data Encryption
  - Hardware-Based Encryption Devices

Module 8 - Cryptography Basics

- An Overview of Cryptography
  - Understanding Non-mathematical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms
  - Wi-Fi Encryption
- Using Cryptographic Systems
  - Confidentiality
  - Integrity
  - Digital Signatures
  - Authentication
  - Non-repudiation
  - Access Control
  - Key Features
- Understanding Cryptography Standards and Protocols
  - The Origins of Encryption Standards
  - Public-Key Infrastructure (X.509/Public-Key Cryptography Standards)
  - X.509
  - SSL and TLS
  - Certificate Management Protocols
  - Secure Multipurpose Internet Mail Extensions
  - Secure Electronic Transaction
  - Secure Shell
  - Pretty Good Privacy
  - HTTP Secure
  - Secure HTTP
  - IP Security
  - Tunneling Protocols
  - Federal Information Processing Standard

Module 9 - Cryptography Implementation

- Using Public Key Infrastructure
  - Using a Certificate Authority
  - Working with Registration Authorities and Local Registration Authorities
  - Implementing Certificates
  - Understanding Certificate Revocation
  - Implementing Trust Models
- Preparing for Cryptographic Attacks
  - Ways to Attack Cryptographic Systems
  - Three Types of Cryptographic Attacks
Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys
- Renewing Keys
- Destroying Keys
- Identifying Key Usage

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
  - EMI Shielding
    - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
  - Working with 802.1X
  - Flood Guards and Loop Protection
  - Preventing Network Bridging
  - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
  - Wireless Transport Layer Security

Module 13 - Disaster Recovery and Incident Response
- Understanding Business Continuity
  - Undertaking Business Impact Analysis
  - Utilities
  - High Availability
  - Disaster Recovery
  - Incident Response Policies
  - Understanding Incident Response
  - Succession Planning
- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
  - Mutual Authentication
  - Authentication Protection
- Backup Management
Baselining

Access

Security
Certificate Management
Communications Security
  - Preauthentication
  - Remote Control/Remote Shell
  - Virtual Private Networks
Directory Services Protection
Disaster Planning
Documenting Your Environment
Email Issues
File-Sharing Basics
Working with IDSs and Honey Pots
Incident Handling
Internet Common Sense
Key Management Conventions
Preventing Common Malicious Events
  - Constructing a Line of Defense
  - Types of Attacks
  - Antivirus Protection
  - Making Stronger Passwords
Managing Personnel
Keeping Physical Security Meaningful
Securing the Infrastructure
Working with Security Zones
Social Engineering Risks
System Hardening Basics
Securing the Wireless Environment
CCNA / CCENT Certification Bootcamp
Course#: CS101
Exams: 640-822 640-816

About this Course
This intense hands-on training course empowers participants with the networking technologies that are required in today’s IT and Telecom environments. In addition to LAN/WAN topics, the course covers routing and network construction and fully prepares participants for the Cisco CCNA/CCENT (Certified Cisco Network Associate/Cisco Certified Networking Technician, 2 separate exams.)

Prerequisites
Network+ or equivalent networking experience in the I.T. industry.

Course Outline

Module 1: Building a Simple Network (ICND1)
- Exploring the Functions of Networking
- Securing the Network
- Host-to-Host Communication Model
- TCP/IP’s Internet Layer
- TCP/IP’s Transport Layer
- Packet Delivery Process
- Understanding Ethernet
- Connecting to an Ethernet LAN

Module 2: Ethernet LANs (ICND1)
- Challenges of Shared LANs
- Solving Network Challenges with Switched LAN Technology
- Packet Delivery Process
- Operating Cisco IOS Software
- Starting the Switch
- Understanding Switch Security
- Maximizing the Benefits of Switching
- Troubleshooting Switch Issues

Module 3: Wireless Local Area Networks (WLANS) (ICND1)
- Exploring Wireless Networking
- Understanding WLAN Security
- Implementing a WLAN

Module 4: LAN Connections (ICND1)
- Functions of Routing
- Understanding Binary Basics
- Constructing a Network Addressing Scheme
- Starting a Router
- Configuring a Router
- Packet Delivery Process
- Understanding Router Security
- Using Cisco Router and Security Device Manager
- Using a Router as a DHCP Server
- Accessing Remote Devices

Module 5: Network Environment Management (ICND1)
- Discovering Neighbors on the Network
- Managing Router Startup and Configuration
- Managing Cisco Devices

Module 6: Small Network Implementation (ICND2)
- Review Lab: Review of a Small Network Environment

Module 7: Medium-Sized Switched Network Construction (ICND2)
- Implementing VLANs and Trunks
- Improving Performance with Spanning Tree
- Routing Between VLANs
- Securing the Expanded Network
- Troubleshooting Switched Networks

Module 8: Wide Area Networks (WANs) (ICND1)
- WAN Technologies
- Enabling the Internet Connection
- Enabling Static Routing
- Configuring Serial Encapsulation
- Enabling Routing Information Protocol (RIP)

Module 9: LAN Extension into a WAN (ICND2)
- Establishing a Point-to-Point WAN Connection with PPP
- Establishing a WAN Connection with Frame Relay
- Troubleshooting Frame Relay WANs
- Introducing VPN Solutions
Module 10: Medium-Sized Routed Network Construction (ICND2)
- Reviewing Routing Operations
- Implementing VLSM

Module 11: Single Area OSPF Implementation (ICND2)
- Implementing OSPF
- Troubleshooting OSPF

Module 12: EIGRP Implementation (ICND2)
- Implementing EIGRP
- Troubleshooting EIGRP

Module 13: Access Control Lists (ACLs) (ICND2)
- Introducing ACL Operation
- Configuring and Troubleshooting ACLs

Module 14: Address Space Management (ICND2)
- Scaling the Network with NAT and PAT
- Transitioning to IPv6
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking.

This primary goal of this course is to help each student pass the exams required to earn the A+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+ certification, students must pass two exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

While both exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure and troubleshoot networking
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components
- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

Section 2: Storage Devices, Power Supplies, and Adapters
- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
  - AC Adapters as Power Supplies
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch

Section 3: Understanding Display Devices
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Section 4: Understanding Laptops and Portable Devices
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Section 5: Installing and Configuring Printers
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
  - Printer Interfaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Section 6: Operating System Features and Interfaces
- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What's in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
Section 7: Installing and Configuring Operating Systems

- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance

- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops

- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
  - Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Section 10: Understanding Networking

- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals

- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures

- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
Section 13: Installing, Maintaining, and Troubleshooting Hardware

- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal
  - Computer Components
  - Understand i i g Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Section 14: Installing, Configuring, and Troubleshooting Laptops

- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems

- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems
- Performing Preventive Maintenance
  - Performing Scheduled Maintenance
  - Using Cleaning Solutions
  - Ensuring a Suitable Environment
  - Using Recommended Supplies
  - Installing Printer Upgrades

Section 16: Operating System Structures and Commands

- Using Operating Systems
  - Using the Command Prompt
  - Understanding and Navigating Directory Structures
- User File Locations
- System File Locations
- Font Files
  - Managing Temporary Files
- Program Files
- Offline Files
  - Windows Vista
  - Windows XP
  - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues

- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.ir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance
- System Performance and Optimization
  - Common Operational Problems
Section 18: Installing and Troubleshooting Networks

- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics

- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Section 19: System Security

- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software

- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks

- Replay Attacks
- Password-Guessing Attacks
- Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
- TCP Attacks

- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools

- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting

- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
  - General Rules for the Exam on Access Control
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+ and Network+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+ and Network+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ exam certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
- Use various network devices
- Mange networks
- Use network Tools
- Implement network security

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
Course Outline

About the Outline
This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Section 1: Personal Computer System Components
Section 2: Storage Devices, Power Supplies, and Adapters
Section 3: Understanding Display Devices
Section 4: Understanding Laptops and Portable Devices
Section 5: Installing and Configuring Printers
Section 6: Operating System Features and Interfaces
Section 7: Installing and Configuring Operating Systems
Section 8: Troubleshooting Theory and Preventive Maintenance
Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
Section 10: Understanding Networking
Section 11: Understanding Network Security Fundamentals
Section 12: Understanding Operational Procedures
Section 13: Installing, Maintaining, and Troubleshooting Hardware
Section 14: Installing, Configuring, and Troubleshooting Laptops
Section 15: Resolving Printer Problems
Section 16: Operating System Structures and Commands
Section 17: Operating System Utilities and Troubleshooting Issues
Section 18: Installing and Troubleshooting Networks
Section 19: System Security
Section 20 Network Technologies
Section 21 Network Media and Topologies
Section 22 Network Devices
Section 23 Network Management
Section 24 Network Tools
Section 25 Network Security
# About this Course

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## Required Exams

To earn the CompTIA A+ and Network+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

## Audience Profile

This course is intended for students seeking to earn the CompTIA A+ and Network+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

## At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ exam certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
- Use various network devices
- Manage networks
- Use network tools
- Implement network security

## Prerequisites

Students should be familiar with pc hardware and networking fundamentals.
## Course Outline

**About the Outline**

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

| Section 1: Personal Computer System Components | Section 20 Network Technologies |
| Section 2: Storage Devices, Power Supplies, and Adapters | Section 21 Network Media and Topologies |
| Section 3: Understanding Display Devices | Section 22 Network Devices |
| Section 4: Understanding Laptops and Portable Devices | Section 23 Network Management |
| Section 5: Installing and Configuring Printers | Section 24 Network Tools |
| Section 6: Operating System Features and Interfaces | Section 25 Network Security |
| Section 7: Installing and Configuring Operating Systems | |
| Section 8: Troubleshooting Theory and Preventive Maintenance | |
| Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops | |
| Section 10: Understanding Networking | |
| Section 11: Understanding Network Security Fundamentals | |
| Section 12: Understanding Operational Procedures | |
| Section 13: Installing, Maintaining, and Troubleshooting Hardware | |
| Section 14: Installing, Configuring, and Troubleshooting Laptops | |
| Section 15: Resolving Printer Problems | |
| Section 16: Operating System Structures and Commands | |
| Section 17: Operating System Utilities and Troubleshooting Issues | |
| Section 18: Installing and Troubleshooting Networks | |
| Section 19: System Security | |
About this Course

The CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. The A+ certification confirms a technician's ability to perform essential tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. Likewise, the Network+ certification validates the knowledge and skills of networking professionals.

This primary goal of this course is to help each student pass the exams required to earn both the A+ and Network+ certifications. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA A+, Network+, and Security+ certifications, students must pass three exams:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

While both A+ exams cover hardware, software, and security, the first exam focuses on identifying and understanding fundamental concepts and technologies. Building on the first exam, the second A+ exam focuses on applying skills and techniques to solve problems related to troubleshooting and maintenance. The Network+ exam focuses only on network topologies, technologies, and security.

Audience Profile

This course is intended for students seeking to earn the CompTIA A+, Network+, and Security+ certifications and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA A+ certification and the single exam required for Network+ certification and the single exam required for Security+ certification:

- 220-801: A+ IT Essentials
- 220-802: A+ Practical Application
- N10-005: Network+
- SY0-004: Security+

In addition, students will be able to:

- Identify and select appropriate hardware
- Troubleshoot, repair, and maintain computers
- Install and troubleshoot operating systems and software
- Configure computers and networks to maximize security
- Identify best practices in operational procedures and customer service
- Identify and use various network technologies, media, and topologies
- Use various network devices
- Manage networks
- Use network Tools
- Understand and implement network security
- Manage compliance and operational security
- Identify various threats and vulnerabilities
- Implement application, data and host security
- Manage access control and identity management
- Understand and implement cryptography

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**About the Outline**

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

**Section 1: Personal Computer System Components**

**Section 2: Storage Devices, Power Supplies, and Adapters**

**Section 3: Understanding Display Devices**

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**Section 5: Installing and Configuring Printers**

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**Section 7: Installing and Configuring Operating Systems**

**Section 8: Troubleshooting Theory and Preventive Maintenance**

**Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops**

**Section 10: Understanding Networking**

**Section 11: Understanding Network Security Fundamentals**

**Section 12: Understanding Operational Procedures**

**Section 13: Installing, Maintaining, and Troubleshooting Hardware**

**Section 14: Installing, Configuring, and Troubleshooting Laptops**

**Section 15: Resolving Printer Problems**

**Section 16: Operating System Structures and Commands**

**Section 17: Operating System Utilities and Troubleshooting Issues**

**Section 18: Installing and Troubleshooting Networks**

**Section 19: System Security**

**Section 20 Network Technologies**

**Section 21 Network Media and Topologies**

**Section 22 Network Devices**

**Section 23 Network Management**

**Section 24 Network Tools**

**Section 25 Network Security**

**Section 26 Compliance and Operational Security**

**Section 27 Threats and Vulnerabilities**

**Section 28 Application, Data and Host Security**

**Section 29 Access Control and Identity Management**

**Section 30 Cryptography**
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

This primary goal of this course is to help each student pass the exams required to earn the Security+ certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA Security+ certification, students must pass exam SY0-301.

Audience Profile

This course is intended for students seeking to earn the CompTIA Security+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have passed exam SY0-301 required for the CompTIA Security+ certification. In addition, students will be able to:

- Understand and implement network security
- Manage compliance and operational security
- Identify various threats and vulnerabilities
- Implement application, data and host security
- Manage access control and identity management
- Understand and implement cryptography

Prerequisites

Students should be familiar with pc hardware and networking fundamentals.

Course Outline

About the Outline

This outline includes all topics relevant to the required exams, however, due to the flexible nature of this bootcamp course, your instructor will customize your training to focus on topics you need to fill the knowledge gap in order for you to successfully pass the exams and earn your certification.

Module 1 - Measuring and Weighing Risk

- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
  - Risks Associated with Cloud Computing
  - Risks Associated with Virtualization

Module 2 - Infrastructure and Connectivity

- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
  - Business Policies
  - Understanding Control Types, False Positives, and Change and Incident Management
- Mastering TCP/IP 9
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
Module 3 - Protecting Networks
- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems
- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots
- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol
- Understanding Network Protocols

Module 4 - Threats and Vulnerabilities
- Understanding Encapsulation
- Working with Protocols and Services
- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements
- Understanding Infrastructure Security
  - Working with Hardware Components
  - Working with Software Components
- Understanding the Different Network Infrastructure Devices
  - Firewalls
  - Hubs
  - Modems
  - Remote Access Services
  - Routers
  - Switches
  - Load Balancers
  - Telecom/PBX Systems
  - Virtual Private Networks
  - Web Security Gateway
  - Spam Filters
- Understanding Remote Access
  - Using Point-to-Point Protocol
  - Working with Tunneling Protocols

Module 5 - Access Control and Identity Management
- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider
- Understanding Remote Access Connectivity
  - Using the Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Working with RADIUS
  - TACACS/TACACS+/XTACACS
  - VLAN Management
- Understanding Authentication Services
  - LDAP
  - Kerberos
  - Single Sign-On Initiatives
- Understanding Access Control
  - Mandatory Access Control
  - Discretionary Access Control
  - Role-Based Access Control
  - Rule-Based Access Control
- Implementing Access Control Best Practices
  - Smart Cards
  - Access Control Lists
  - Trusted OS
  - Secure Router Configuration

Module 6 - Educating and Protecting the User
- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness
- Antivirus Software
- Calculating Attack Strategies
- Understanding Access Attack Types
- Recognizing Modification and Repudiation Attacks
- Identifying Denial-of-Service and Distributed Denial-of-Service Attacks
- Recognizing Botnets
- Recognizing Common Attacks
  - Backdoor Attacks
  - Spoofing Attacks
  - Phishing Attacks
  - Phishing and Spear Phishing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Privilege Escalation
- Identifying TCP/IP Security Concerns
  - Recognizing TCP/IP Attacks

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Module 7 - Operating System and Application Security

- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
  - SQL Injection
  - LDAP Injection
  - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Antimalware
  - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Malware Inspection
  - Data Loss Prevention
  - Data Encryption
- Hardware-Based Encryption Devices

Information Access Controls
- Complying with Privacy and Security Regulations
  - The Health Insurance Portability and Accountability Act
  - The Gramm-Leach-Bliley Act
  - The Computer Fraud and Abuse Act
  - The Family Educational Rights and Privacy Act
  - The Computer Security Act of 1987
  - The Cyberspace Electronic Security Act
  - The Cyber Security Enhancement Act
  - The Patriot Act
  - Familiarizing Yourself with International Efforts

Understanding Social Engineering
- Types of Social Engineering Attacks
- What Motivates an Attack?
- Social Engineering Attack Examples

Module 8 - Cryptography Basics

An Overview of Cryptography
- Understanding Non-mathematical Cryptography
- Understanding Mathematical Cryptography
- Working with Passwords
- Understanding Quantum Cryptography
- Uncovering the Myth of Unbreakable Codes

Understanding Cryptographic Algorithms
- The Science of Hashing
- Working with Symmetric Algorithms
- Working with Asymmetric Algorithms
- Wi-Fi Encryption

Using Cryptographic Systems
- Confidentiality
- Integrity
- Digital Signatures
- Authentication
- Non-repudiation
- Access Control
- Key Features

Understanding Cryptography Standards and Protocols
- The Origins of Encryption Standards
- Public-Key Infrastructure X.509/Public-Key Cryptography Standards
- SSL/TLS
- Certificate Management Protocols
- Secure Multipurpose Internet Mail Extensions
- Secure Electronic Transaction
- Secure Shell
- Pretty Good Privacy
- HTTP Secure
- Secure HTTP
- IP Security
- Tunneling Protocols
- Federal Information Processing Standard

Module 9 - Cryptography Implementation

Using Public Key Infrastructure
- Using a Certificate Authority
- Working with Registration Authorities and Local Registration Authorities
- Implementing Certificates
- Understanding Certificate Revocation
- Implementing Trust Models

Preparing for Cryptographic Attacks
- Ways to Attack Cryptographic Systems
- Three Types of Cryptographic Attacks
Module 4 - Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
  - EMI Shielding
    - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
    - Working with 802.1X
  - Flood Guards and Loop Protection
    - Preventing Network Bridging
    - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
  - Wireless Transport Layer Security

Module 13 - Disaster Recovery and Incident Response
- Understanding Business Continuity
  - Undertaking Business Impact Analysis
  - Utilities
  - High Availability
  - Disaster Recovery
  - Incident Response Policies
  - Understanding Incident Response
  - Succession Planning
- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
- Mutual Authentication
- Authentication Protection
- Backup Management
Baselinin

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Security
● Certificate Management
● Communications Security
  ◦ Preauthentication
  ◦ Remote Control/Remote Shell
  ◦ Virtual Private Networks
● Directory Services Protection
● Disaster Planning
● Documenting Your Environment
● Email Issues
● File-Sharing Basics
● Working with IDSs and Honey Pots
● Incident Handling
● Internet Common Sense
● Key Management Conventions
● Preventing Common Malicious Events
  ◦ Constructing a Line of Defense
  ◦ Types of Attacks
  ◦ Antivirus Protection
  ◦ Making Stronger Passwords
● Managing Personnel
● Keeping Physical Security Meaningful
● Securing the Infrastructure
● Working with Security Zones
● Social Engineering Risks
● System Hardening Basics
● Securing the Wireless Environment
About this Course

CompTIA Linux+ Powered by LPI is a high-stakes, vendor-neutral certification that validates the fundamental knowledge and skills required of junior Linux administrators.

The two leading Linux certification bodies, CompTIA and Linux Professional Institute (LPI), have joined forces to release two new Linux+ exams, LX0-101 and LX0-102. This training course breaks down everything you need to prepare for the exams. Covering all exam objectives, the course will teach you Linux command-line tools, managing software, configuring hardware, managing files and file systems, and much more.

Audience Profile

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration, or to prepare for the CompTIA Linux+ Powered by LPI (Exams LX0-01, LX0-102).

At Course Completion

After completing this course, students will have passed the two required exams for the CompTIA Linux+ certification: LX0-101 and LX0-102.

In addition, students will be able to:

- Implement Linux command-line tools
- Manage software
- Configure hardware
- Understand boot process and scripts
- Manage files and file systems
- Administer the Windows X system- networking, server and system security

Prerequisites

CompTIA A+ certification, or the equivalent skills and knowledge, is helpful but not required.

Course Outline

Module 1: Exploring Linux Command-Line Tools

- Understanding Command-Line Basics Exploring Your Linux Shell Options
- Using a Shell
- Exploring Shell Configuration
- Using Environment Variables
- Getting Help
- Using Streams, Redirection, and Pipes
- Exploring Types of Streams
- Redirecting Input and Output
- Piping Data Between Programs
- Generating Command Lines
- Processing Text Using Filters
- File-Combining Commands

Module 2: Managing Software

- File-Transforming Commands
- File-Formatting Commands
- File-Viewing Commands
- File-Summarizing Commands
- Using Regular Expressions
- Understanding Regular Expressions
- Using grep
- Using sed

Module 3: Managing Software

- Package Concepts
- Using RPM
- RPM Distributions and Conventions
- The rpm Command Set
Module 3: Configuring Hardware
- Configuring the BIOS and Core Hardware
- Understanding the Role of the BIOS
- IRQs
- I/O Addresses
- DMA Addresses
- Boot Disks and Geometry Settings
- Coldplug and Hotplug Devices
- Configuring Expansion Cards
- Configuring PCI Cards
- Learning about Kernel Modules
- Loading Kernel Modules
- Removing Kernel Modules
- Configuring USB Devices
- USB Basics
- Linux USB Drivers
- USB Manager Applications
- Configuring Hard Disks
- Configuring PATA Disks
- Configuring SATA Disks
- Configuring SCSI Disks

Module 4: Managing Files
- Managing Files
- File Naming and Wildcard Expansion Rules
- File Commands
- File Archiving Commands
- Managing Links
- Directory Commands
- Managing File Ownership
- Assessing File Ownership
- Changing a File's Owner
- Changing a File's Group
- Controlling Access to Files
- Understanding Permissions
- Changing a File's Mode
- Setting the Default Mode and Group
- Changing File Attributes
- Managing Disk Quotas
- Enabling Quota Support
- Setting Quotas for Users
- Locating Files
- The FHS
- Tools for Locating Files

Module 5: Booting Linux and Editing Files
- Installing Boot Loaders
- Boot Loader Principles
- Using LILO as the Boot Loader
- Using GRUB as the Boot Loader
- Understanding the Boot Process
- Extracting Information about the Boot Process
- Locating and Interpreting Boot Messages
- The Boot Process
Module 6: Configuring the X Window System
- Localization, and Printing
- Configuring Basic X Features
- X Server Options for Linux
- Methods of Configuring X
- X Configuration Options
- Obtaining X Display Information
- Configuring X Fonts
- Font Technologies and Formats
- Configuring X Core Fonts
- Configuring a Font Server
- Configuring Xf Fonts
- Managing GUI Logins
- The X GUI Login System
- Running an XDMCP Server
- Configuring an XDMCP Server
- Using X for Remote Access
- X Client/Server Principles
- Using Remote X Clients
- X Accessibility
- Keyboard and Mouse Accessibility Issues
- Screen Display Settings
- Using Additional Assistive Technologies
- Configuring Localization and Internationalization
- Setting Your Time Zone
- Querying and Setting Your Locale
- Configuring Printing
- Conceptualizing the Linux Printing Architecture
- Understanding PostScript and Ghostscript
- Running a Printing System
- Configuring CUPS
- Monitoring and Controlling the Print Queue

Module 7: Administering the System
- Managing Users and Groups
- Understanding Users and Groups
- Configuring User Accounts
- Configuring Groups
- Tuning User and System Environments
- Using System Log Files
- Understanding syslogd

Module 8: Configuring Basic Networking
- Understanding TCP/IP Networking
- Knowing the Basic Functions of Network Hardware
- Investigating Types of Network Hardware
- Understanding Network Packets
- Understanding Network Protocol Stacks
- Knowing TCP/IP Protocol Types
- Understanding Network Addressing
- Using Network Addresses
- Resolving Hostnames
- Network Ports
- Configuring Linux for a Local Network
- Network Hardware Configuration
- Configuring with DHCP
- Configuring with a Static IP Address
- Configuring Routing
- Using GUI Configuration Tools
- Using the ifup and ifdown Commands
- Configuring Hostnames
- Diagnosing Network Connections
- Testing Basic Connectivity
- Tracing a Route
- Checking Network Status
- Examining Raw Network Traffic
- Using Additional Tools

Module 9: Writing Scripts, Configuring E-mail, and Using Databases
- Managing the Shell Environment
- Reviewing Environment Variables
- Understanding Common Environment Variables
- Using Aliases
- Modifying Shell Configuration Files
- Writing Scripts
- Beginning a Shell Script
- Using Commands
Module 10: Securing Your System

- Administering Network Security
- Using Super Server Restrictions
- Disabling Unused Servers
- Administering Local Security
- Securing Passwords
- Limiting root Access
- Setting Login, Process, and Memory Limits
- Locating SUID/SGID Files
- Configuring SSH
- SSH Basics
- Setting SSH Options for Your System
- SSH Security Considerations
- Using GPG
- Generating and Importing Keys
- Encrypting and Decrypting Data
- Signing Messages and Verifying Signatures
About this Course

The CompTIA Server+ certification is an international vendor neutral credential that validates skills and knowledge needed to build and support server hardware.

The primary goal of this course is to help each student pass the exams required to earn the Server + certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures. Our on-site testing center allows you to take the exam when you're ready.

Required Exams

To earn the CompTIA Server + certification, students must pass exam SK0-003.

Audience Profile

This course is intended for students seeking to earn the CompTIA Server+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

At Course Completion

After completing this course, students will have the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. Students will be able to:

- Identify environmental issues
- Understand and comply with disaster recovery and physical / software security procedures
- Be familiar with industry terminology and concepts
- Understand server roles / specializations and interaction within the overall computing environment.

Prerequisites

The CompTIA Server+ certification is targeted towards individuals with 18-24 months of IT experience. Although not a prerequisite, it is recommended that CompTIA Server+ candidates hold a CompTIA A+ certification.

Course Outline

1.0 System Hardware

1.1 Differentiate between system board types, features, components and their purposes.

- Dip switches / jumpers
- Processor (single and multi)
- Bus types and bus speeds
- On board components
- Expansion slots
- BIOS
- Riser Card / backplane
- Storage connectors

1.2 Deploy different chassis types and the appropriate components

- Cooling
- Form Factor (tower, rack, blade)
- Power
- Redundant power
- Shut off switches – chassis intrusion
- Power buttons
- Reset buttons
- Diagnostic LEDs
- Expansion bays
1.3 Differentiate between memory features / types and given a scenario select appropriate memory
- Memory pairing
- ECC vs. non ECC
- Registered vs. non-registered
- RAID and hot spares
- Types
- Memory compatibility
- On board vs. riser card

1.4 Explain the importance of a Hardware Compatibility List (HCL)
- Vendor standards for hardware
- Memory and processor compatibility
- Expansion cards compatibility
- Virtualization requirements

1.5 Differentiate between processor features / types and given a scenario select the appropriate processor
- Multicore
- Multiprocessor
- Cache levels
- Stepping
- Speed
- VRMs
- Execute disable (XD) or not execute (NX)
- Hyper-Threading
- VT or AMD-V
- AMD vs. Intel (non-compatible CPUs)
- Processor architecture (RISC, CISC)
- Vendor slot types
- 64bit vs. 32 bit
- Heat dissipation (heat sinks, fans, liquid cooling)

1.6 Given a scenario, install appropriate expansion cards into a server while taking fault tolerance into consideration.
- Manufacturer specific
- HBAs
- NICs
- Video
- Audio
- Storage controller (SCSI, SATA, RAID)
- Port expansion cards

1.7 Install, update and configure appropriate firmware.
- Driver / hardware compatibility
- Implications of a failed firmware upgrade (redundant BIOS)
- Follow manufacturer instructions and documentation

2.0 Software

2.1 Install, deploy, configure and update NOS (Windows / *nix).
- Installation methods (optical media, USB, network share, PXE) virtualization templates)
- Bootloader
- File systems
- Driver installation
- Configure NOS
- Patch management

2.2 Explain NOS security software and its features.
- Software firewall
- Malware protection software
- Basics of file level permissions vs. share permissions

2.3 Given a scenario, implement and administer NOS management features based on procedures and guidelines
- User management
- Resource management
- Monitoring (tools and agents)

2.4 Explain different server roles, their purpose and how they interact
- File and print server
- Database server
- Web server
- Messaging server
- DHCP server
- Directory services server
- DNS server
- Application server
- Remote access server
- Virtualized services
- NTP server
- Explain the different between a workstation, desktop and a server
- Server shut down and start up sequence (one server vs. multiple servers vs. attached components)

2.5 Summarize server virtualization concepts, features and considerations
- Resource utilization
- Configuration
- Interconnectivity
- Management server
- Reasons for virtualization

2.6 Describe common elements of networking essentials
- TCP/IP
- Ethernet
- VPN
- VLAN
- DMZ
3.0 Storage

3.1 Describe RAID technologies and its features and benefits
- Hot spare
- Software vs. hardware
- Cache read/write levels (data loss potential)
- Performance benefits and tradeoffs

3.2 Given a scenario, select the appropriate RAID level
- 0, 1, 3, 5, 6, 10, 50
- Performance benefits and tradeoffs

3.3 Install and configure different internal storage technologies
- Hot swappable vs. non-hot swappable
- SCSI, Ultra SCSI, Ultra320 (termination), LUNs
- SAS, SATA
- Tape
- Optical
- Flash
- Floppy (USB)
- Controller (firmware levels)
- Hard drive (firmware, JBOD)

3.4 Summarize the purpose of external storage technologies
- Network attached storage
- Storage area network
- Tape library
- WORM
- Optical jukebox
- Transport media

4.0 IT Environment

4.1 Write, utilize and maintain documentation, diagrams and procedures
- Follow pre-installation plan when building or upgrading servers
- Labeling
- Diagram server racks and environment topologies
- Hardware and software upgrade, installation, configuration, server role and repair logs
- Document server baseline (before and after service)
- Original hardware configuration, service tags, asset management and warranty
- Vendor specific documentation

4.2 Given a scenario, explain the purpose of the following industry best practices
- Follow vendor specific server best practices
- Explore ramifications before implementing change – determine organizational impact
- Communicate with stakeholders before taking action and upon completion of action
- Comply with all local laws / regulations, industry and corporate regulations

4.3 Determine an appropriate physical environment for the server location
- Check for adequate and dedicated power, proper amperage and voltage communication and shut down, proper monitoring
- Server cooling considerations – HVAC

4.4 Implement and configure different methods of server access
- KVM (local and IP based)
- Direct connect

4.5 Given a scenario, classify physical security measures for a server location
- Physical server security
- Access control devices (RFID, keypads, pinpads)
- Security procedures
- Defense in-depth – multiple layers of defense
- Reasons for physical security
- Secure documentation related to servers

5.0 Disaster Recovery

5.1 Compare and contrast backup and restoration methodologies, media types and concepts
- Methodologies (full, incremental, differential, selective)
- Media types
- Backup security and off-site storage
- Importance of testing the backup and restoration process

5.2 Given a scenario, compare and contrast the different types of replication methods
- Disk to disk
- Server to server
- Site to site
- Site types

5.3 Explain data retention and destruction concepts
- Awareness of potential legal requirements
- Awareness of potential company policy requirements
- Differentiate between archiving and backup

5.4 Given a scenario, carry out the following basic steps of a disaster recovery plan
- Disaster recovery testing process
- Follow emergency procedures (people first)
- Use appropriate fire suppressants
- Follow appropriate fire suppressants
- Classification of systems (prioritization during recovery)
## 6.0 Troubleshooting

### 6.1 Explain troubleshooting theory and methodologies
- Identify the problem and determine the scope environment
- Establish a theory of probable cause (question the obvious) multiple problems
- Test the theory to determine cause
- Establish a plan of action to resolve the problem and notify impacted users
  - Implement the solution or escalate as appropriate resolved the problem
  - Implement new change
  - Verify full system functionality and if applicable implement preventative measures
  - Perform a root cause analysis
  - Document findings, actions and outcomes throughout the process

### 6.2 Given a scenario, effectively troubleshoot hardware problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Environmental issues
- Hardware tools

### 6.3 Given a scenario, effectively troubleshoot software problems, selecting the appropriate tools and methods
- Common problems
- Cause of common problems
- Software tools

### 6.4 Given a scenario, effectively diagnose network problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Networking tools

### 6.5 Given a scenario, effectively troubleshoot storage problems, selecting the appropriate tools and methods
- Common problems
- Causes of common problems
- Storage tools
About this Course

Launch your IT career with CompTIA’s popular A+ certification. One of our most demanded courses, this hands-on course teaches you to build, troubleshoot, and repair computers. Our certified instructors guide you through each topic, teaching you essential concepts through hands-on exercises and demonstrations. As you prepare to take the two required certification exams, our instructors serve as an invaluable exam-preparation resource by answering any questions and providing you with practice tests, flash cards, and more.

Audience Profile

More than 700,000 people worldwide have become CompTIA A+ certified since the program’s inception in 1993. Many companies, including CompuCom and Ricoh, have made CompTIA A+ certification mandatory for their service technicians.

Earning the CompTIA A+ certification also opens doors to many IT career possibilities. CompTIA A+ is part of the certification track for vendors such as Microsoft, Hewlett-Packard, Cisco and Novell allowing you go on to become a systems administrator, systems engineer, or more.

At Course Completion

After completing this course, students will be able to demonstrate knowledge and skills in the following areas:

- Personal Computer System Components
- Storage Devices, Power Supplies, and Adapters
- Understanding Display Devices
- Understanding Laptops and Portable Devices
- Installing and Configuring Printers
- Operating System Features and Interfaces
- Installing and Configuring Operating Systems
- Troubleshooting Theory and Preventive Maintenance
- Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Understanding Networking
- Understanding Network Security Fundamentals
- Understanding Operational Procedures
- Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Troubleshooting Laptops
- Resolving Printer Problems
- Operating System Structures and Commands
- Operating System Utilities and Troubleshooting Issues
- Installing and Troubleshooting Networks
- System Security

Prerequisites

There are no prerequisites for attending the course.
### Course Outline

**Section 1: Personal Computer System Components**
- Identifying Components of Motherboards
  - Types of System Boards
  - System Board Form Factors
  - System Board Components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
  - Important Memory Terms
  - Types of Memory
  - Memory Packaging
  - Identifying Characteristics of Ports and Cables
  - Peripheral Port Connector Types
  - Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
  - Fans
  - Memory Cooling
  - Hard Drive Cooling
  - Chipset Cooling
  - CPU Cooling

**Section 2: Storage Devices, Power Supplies, and Adapters**
- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector
  - Modern Power Connectors
  - AC Adapters as Power Supplies
- Identifying Input Devices
  - Mouse
  - Keyboard
  - Barcode Reader
  - Multimedia Devices
  - Biometric Devices
  - Touch screens
  - KVM Switch
- Identifying Purposes and Characteristics of Adapter Cards
  - Video
  - Multimedia
  - I/O
  - Communications

**Section 3: Understanding Display Devices**
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

**Section 4: Understanding Laptops and Portable Devices**
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

**Section 5: Installing and Configuring Printers**
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
- Printer Interlaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

**Section 6: Operating System Features and Interfaces**
- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows
- Using Operating Systems
  - The Windows Interface
  - What’s in a Window?
  - Control Panel
  - The Command Prompt
  - Administrative Tools
  - The Registry
  - Virtual Memory
  - Windows System Files
  - Disc Management
  - File Management
Section 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
- Performing a Repair Install
- Common Installation Problems
- Installing Device Drivers
  - Rights and Security Issues
  - Basic Procedure for Device Installation
  - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
- Identifying Boot Sequences

Section 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
- Understanding Preventive Maintenance
  - Managing the Physical Environment
  - Using the Right Repair Tools and Cleaning Materials
  - Running Updates
  - Using Disk Management Tools
  - Backing Up Data and Creating Restore Points

Section 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Troubleshooting Common Operating System Problems
- Troubleshooting Hardware Symptoms
- Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Section 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Section 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Section 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
  - Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
- Applying Proper Safety and Disposal Procedures
  - Preventing Electrostatic Discharge
  - Preventing Electromagnetic Interference
  - Working in a Safe Environment
  - Handling Equipment
  - Following Disposal Procedures
Section 16: Operating System Structures and Commands

- Using Operating Systems
  - Using the Command Prompt
  - Understanding and Navigating Directory Structures
  - User File Locations
  - System File Locations
  - Font Files
  - Program Files
  - Offline Files
    - Windows Vista
    - Windows XP
    - Windows 2000

Section 17: Operating System Utilities and Troubleshooting Issues

- Performing Preventative Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points

- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.iir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions

- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting

- Using Windows-Based Troubleshooting Utilities
  - Disk Management Tools
  - Disk and Remote Management
    - Getting Disks Ready to Store Files and Programs
    - Remote Desktop Connection and Assistance
  - System Performance and Optimization
    - Common Operational Problems

Section 18: Installing and Troubleshooting Networks

- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics

Section 13: Installing, Maintaining, and Troubleshooting Hardware

- Installing, Configuring, and Maintaining PC Components
  - Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems

- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques

- Removing, installing, and Configuring Components
  - Selecting Components

- Using Tools and Diagnostics Procedures for Personal Computer Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 14: Installing, Configuring, and Troubleshooting Laptops

- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation

- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Section 15: Resolving Printer Problems

- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems

- Performing Preventive Maintenance
  - Performing Scheduled Maintenance
  - Using Cleaning Solutions
  - Ensuring a Suitable Environment
  - Using Recommended Supplies
  - Installing Printer Upgrades

- Performing Preventive Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points

- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.iir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions

- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting

- Using Windows-Based Troubleshooting Utilities
  - Disk Management Tools
  - Disk and Remote Management
    - Getting Disks Ready to Store Files and Programs
    - Remote Desktop Connection and Assistance
  - System Performance and Optimization
    - Common Operational Problems

Section 18: Installing and Troubleshooting Networks

- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
Troubleshooting Client-Side Connectivity Issues
- Troubleshooting TCP/IP Settings
- Using Client-Side Tools
- Troubleshooting Proxies and Firewalls

Section 19: System Security
- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
  - TCP Attacks

Recovering Operating Systems
- Recovery Console
- Recovery CD/DVD
- Automated System Recovery
- Emergency Repair Disk
- Diagnostic Tools

Security and Troubleshooting
- Hardening the OS
- Updating Your Operating System
- Working with File systems
- General Rules for Security and Troubleshooting

Access Control
- Working with Policies
- Working with Disks and Directories
- Auditing and Logging
- BIOS Security
- Encrypting File System
- General Rules for the Exam on Access Control
Kick-start your IT career with CompTIA’s A+ and Network+ certifications. We’ve combined these two popular courses into one course so that you can learn to build, troubleshoot, and repair computers and networks in the shortest possible time.

The CompTIA A+ certification is the industry standard for computer support technicians. The international, vendor-neutral certification proves competence in areas such as installation, preventative maintenance, networking, security and troubleshooting.

The CompTIA Network+ certification is the sign of a competent networking professional. It is an international, vendor-neutral certification that proves a technician’s competency in managing, maintaining, troubleshooting, installing and configuring basic network infrastructure.

Audience Profile
This course is recommended for students wanting to start a career in computer networking.

At Course Completion
After completing this course, students will be able to:

- Build computers
- Troubleshoot and repair computers
- Installation hardware
- Conduct preventative maintenance
- Troubleshoot and configure networking
- Recognize security risks
- Identify and use networking hardware and components
- Identify and use networking media and connectors
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- Identify and use networking media and connectors
- Identify and use networking hardware and components
- Identifying Purposes and Characteristics of Processors
- Identifying Purposes and Characteristics of Memory
- Identifying Memory Terms
- Identifying Memory Characteristics of Ports and Cables
- Identifying Peripheral Port Connector Types
- Identifying Common Peripheral Interfaces and Cables
- Identifying Purposes and Characteristics of Cooling Systems
- Fans
- Memory Cooling
- Hard Disk Drive Cooling
- Chipset Cooling
- CPU Cooling

Module 2: Storage Devices, Power Supplies, and Adapters

- Identifying Purposes and Characteristics of Storage Devices
  - Hard Disk Drive Systems
  - Floppy Drives
  - Optical Storage Drives
  - Other Storage Media
- Identifying Purposes and Characteristics of Power Supplies
  - Floppy Drive Power Connectors
  - AT System Connectors
  - Standard Peripheral Power Connector

Prerequisites
There are no prerequisites for attending the course.

Course Outline
Module 3: Understanding Display Devices
- Understanding Display Types and Settings
  - Video Display Types
  - Adjusting Display Settings
- Understanding Video Standards and Technologies
  - Video Standards
  - Advanced Video Resolutions
  - LCD-Specific Concepts
  - Additional Video Technologies

Module 4: Understanding Laptops and Portable Devices
- Understanding Laptop Architecture
  - Laptops vs. Desktops
  - Laptop Case
  - Motherboards and Processors
  - Memory
  - Storage
  - Input Devices
  - Expansion Buses and Ports
  - Docking Stations
  - Power Systems
- Laptop Power Management
  - Understanding Laptop Power Management
  - Managing Power in Windows

Module 5: Installing and Configuring Printers
- Understanding Printer Types and Processes
  - Impact Printers
  - Bubble-Jet Printers
  - Laser Printers
  - Printer Interfaces and Supplies
- Installing and Configuring Printers
  - Printer Installation Procedures

Module 6: Operating System Features and Interfaces
- Understanding Operating Systems
  - Operating System Terms and Concepts
  - Microsoft Windows

Module 7: Installing and Configuring Operating Systems
- File Systems and Directories
  - File Systems: FAT32 vs. NTFS
  - Files and Folders
- Installing Operating Systems
  - Determining OS Installation Options
  - Determining the Installation Method
  - Preparing the Computer for Installation
  - Installing Windows 2000
  - Windows XP Installation
  - Windows Vista Installation
  - Post-installation Routines
- Upgrading Operating Systems
  - Upgrading to Windows Vista
  - Upgrading to Windows XP
  - Finalizing Your Upgrade
  - Migrating User Data
  - Performing a Repair Install
  - Common Installation Problems
  - Installing Device Drivers
    - Rights and Security Issues
    - Basic Procedure for Device Installation
    - Windows Version-Specific Installation Items
- Optimizing Windows
  - Keeping the System Current
  - Power Management
  - Identifying Boot Sequences

Module 8: Troubleshooting Theory and Preventive Maintenance
- Understanding Troubleshooting Theory
  - Identifying the Problem
  - Establishing a Theory
  - Testing Solutions
  - Establishing a Plan of Action
  - Verifying Functionality
  - Documenting the Work
  - Understanding Preventive Maintenance
Module 9: Troubleshooting Operating Systems, Hardware, Printers, and Laptops
- Identifying Troubleshooting Resources
  - User/Installation Manuals
  - Internet/Web Resources
  - Training Materials
- Understanding Operating System and Hardware Symptoms
  - Troubleshooting Common Operating System Problems
  - Troubleshooting Hardware Symptoms
- Troubleshooting Printers
- Troubleshooting Common Laptop Issues
  - Diagnosing Laptop Problems
  - Preventive Maintenance on Laptops

Module 10: Understanding Networking
- Understanding Networking Principles
  - Understanding Networking Fundamentals
  - Understanding Networking Protocols
- Identifying Common Network Hardware
  - Network Interface Cards (NICs)
  - Cabling and Connectors
  - Networking Components
- Comparing Network Types
  - Wired Networks
  - Wireless Networks
  - Virtual Private Networks (VPNs)

Module 11: Understanding Network Security Fundamentals
- Understanding Security
  - Authentication technologies
  - Working with hardware and Software Security
  - Understanding Wireless Security
  - Understanding Physical and Data Security
- Security Solutions
  - BIOS Security
  - Malicious Software Protection
  - Data Access
  - Data Remnant Removal
  - Password Management
  - Locking Workstations
- Identifying Security Problem Areas

Module 12: Understanding Operational Procedures
- Understanding Safety and Environmental Issues
  - Identifying Potential Safety Hazards
- Identifying Environmental Concerns
  - Using Safety Documentation
  - Using Appropriate Repair Tools
  - Handling Accidents
- Applying Proper Safety and Disposal Procedures
  - Preventing Electrostatic Discharge
  - Preventing Electromagnetic Interference
  - Working in a Safe Environment
  - Handling Equipment
  - Following Disposal Procedures
- Demonstrating Communication Skills and Professionalism
  - Communicating with Customers
  - Using Appropriate Behavior
  - Putting It All in Perspective

Module 13: Installing, Maintaining, and Troubleshooting Hardware
- Installing, Configuring, and Maintaining PC Components Working with Storage Devices
  - Working with Motherboards, CPUs, Memory, and Adapter Cards
  - Working with Power Supplies
  - Working with Cooling Systems
- Identifying Tools and Diagnostics for PC Components
  - Gathering Tools
  - Recognizing and Isolating Issues
  - Applying Basic Troubleshooting Techniques
- Removing, installing, and Configuring Components
  - Selecting Components
- Using Tools and Diagnostic Procedures for Personal Computer Components
  - Recognizing Computer Resources
  - Determining Available Resources
  - Manually Specifying a Resource Assignment

Module 14: Installing, Configuring, and Troubleshooting Laptops
- Disassembling and Reassembling Laptops
  - Using the Right Tools
  - Organization and Documentation
- Replacing Laptop Components
  - Understanding LCDs
  - Replacing Hard Drives and Memory
  - Recognizing Internal Laptop Expansion Slots
  - Upgrading Wireless and Video Cards
  - Replacing Other Internal Components
  - Removing External Hardware

Module 15: Resolving Printer Problems
- Troubleshooting Printer Problems
  - Dot-Matrix Printer Problems
  - Bubble-Jet Printer Problems
  - Laser Printer Problems
Module 16: Operating System Structures and Commands

- Using Operating Systems
  - Using the Command Prompt
- Understanding and Navigating Directory Structures
- User File Locations
- System File Locations
- Font Files
  - Managing Temporary Files
- Program Files
- Offline Files
  - Windows Vista
  - Windows XP
  - Windows 2000

Module 17: Operating System Utilities and Troubleshooting Issues

- Performing Preventive Maintenance on Operating Systems
  - Using Recommended Hardware
  - Obtaining Current Drivers
  - Installing Windows Properly
  - Shutting Down Properly
  - Updating Windows
  - Creating Restore Points
- Dealing with Boot Issues
  - Advanced Startup Options
  - Using the Rcp.ir Options (Windows Vista)
  - Using the Recovery Console (Windows 2000 and Windows XP)
  - Creating Boot Disks or an Emergency Repair Disk
  - Common Boot Errors and Solutions
- Solving Windows File-Related Problems
  - System Files Not Found
  - Configuration File Issues
  - Swap File Issues
  - Troubleshooting Other Common Problems
  - Understanding Windows Reporting
- Using Windows-Based Troubleshooting Utilities Disk Management Tools
  - System Management Tools
- Disk and Remote Management
  - Getting Disks Ready to Store Files and Programs
  - Remote Desktop Connection and Assistance
- System Performance and Optimization
  - Common Operational Problems

Module 18: Installing and Troubleshooting Networks

- Installing and Configuring SOHO Networks
  - Choosing Connection Types
  - Installing the Network
  - Understanding Firewall Basics
- Troubleshooting Client-Side Connectivity Issues
  - Troubleshooting TCP/IP Settings
  - Using Client-Side Tools
  - Troubleshooting Proxies and Firewalls

Module 19: System Security

- Security Basics
- Viruses and Malware
  - Symptoms of a Virus/Malware Infection
  - How Viruses Work
  - Types of Viruses
  - Virus Transmission in a Network
  - Antivirus Software
- Recognizing Common Attacks
  - Back Door Attacks
  - Spoofing Attacks
  - Man-in-the-Middle Attacks
  - Replay Attacks
  - Password-Guessing Attacks
  - Denial-of-Service (DoS and Distributed DoS (DDoS) Attacks
  - TCP Attacks
- Recovering Operating Systems
  - Recovery Console
  - Recovery CD/DVD
  - Automated System Recovery
  - Emergency Repair Disk
  - Diagnostic Tools
- Security and Troubleshooting
  - Hardening the OS
  - Updating Your Operating System
  - Working with File systems
  - General Rules for Security and Troubleshooting
- Access Control
  - Working with Policies
  - Working with Disks and Directories
  - Auditing and Logging
  - BIOS Security
  - Encrypting File System
  - General Rules for the Exam on Access Control

Module 20: Introduction to Networks

- First Things First: What's a Network?
  - The Local Area Network (LAN)
- Common Network Components
  - Virtual LANs (VLANs)
  - Wide Area Network (WAN)
Module 21: The Open Systems Interconnection Specifications

- Internetworking Models
  - The Layered Approach
  - Advantages of Reference Models

- The OSI Reference Model
  - The Application Layer
  - The Presentation Layer
  - The Session Layer
  - The Transport Layer
  - The Network Layer
  - The Data Link Layer
  - The Physical Layer

- Introduction to Encapsulation

Module 22: Networking Topologies, Connectors, and Wiring Standards

- Physical Media
  - Coaxial Cable
  - Twisted-Pair Cable
  - Fiber-Optic Cable
  - Serial Cables

- Properties of Cables
  - Transmission Speeds
  - Distance
  - Duplex
  - Noise Immunity (Security, EMI)
  - Frequency

- Wiring Standards
  - 568A vs. 568B
  - Straight-Through Cable
  - Crossover Cable
  - Rollover Cable
  - Hardware Loopback

- Installing Wiring Distributions
  - Vertical and Horizontal Cross-Connects
  - Patch Panels
  - Verifying Correct Wiring Installation
  - Verifying Proper Wiring Termination

Module 23: The Current Ethernet Specifications

- Network Basics
- Ethernet Basics
  - Collision Domain
  - Broadcast Domain
  - CSMA/CD
  - Half- and Full-Duplex Ethernet

- Ethernet at the Data Link Layer
  - Binary to Decimal and Hexadecimal Conversion
  - Ethernet Addressing
  - Ethernet Frames
  - Channel Bonding

- Ethernet at the Physical Layer

Module 24: Networking Devices

- Common Network Connectivity Devices
  - Hub
  - Repeater
  - Modem
  - Network Interface Card (NIC)
  - Transceiver (Media Converter)
  - Bridge
  - Switch
  - Wireless Access Point (AP)
  - Firewall
  - Dynamic Host Configuration Protocol (DHCP) Server

- Other Specialized Devices
  - Multilayer Switch
  - Content Switch
  - Intrusion Detection or Prevention System (IDS/IPS)
  - Load Balancer
  - Multifunction Network Devices
  - Domain Name Service (DNS) Server
  - Bandwidth Shaper
  - Proxy Server
  - Channel Service Unit/Data Service Unit (CSU/DSU)

- Network Segmentation
  - Switches and Bridges at the Data Link Layer
  - Hubs at the Physical Layer

Module 25: Introduction to Internet Protocol (IP)

- Introducing TCP/IP
  - A brief History of TCP/IP
  - TCP/IP and the DoD Model
  - The Process/Application Layer Protocol
  - The Host-to-Host Layer Protocol
  - The Internet Layer Protocol

- Data Encapsulation

Module 26: IP Addressing

- IP Terminology
  - The Hierarchical IP Addressing Scheme
Module 27: IP Subnetting, Troubleshooting IP, and Introduction to NAT

- Subnetting Basics
  - How to Create Subnets
  - Subnet Masks
  - Classless Inter-Domain Routing (CIDR)
  - Subnetting Class C Addresses
  - Subnetting Class B Addresses
- Troubleshooting IP Addressing
  - Determining IP Address Problems
- Introduction to Network Address Translation (NAT)
  - Types of Network Address Translation
  - NAT Names
  - How NAT Works

Module 28: Introduction to IP Routing

- Routing Basics
- The IP Routing Process
- Testing Your IP Routing Understanding
- Static and Dynamic Routing

Module 29: Routing Protocols

- Routing Protocol Basics
  - Administrative Distances
  - Classes of Routing Protocols
- Distance-Vector Routing Protocols
  - Routing Information Protocol (RIP)
  - RIP Version 2 (RIPv2)
  - VLSM and Discontiguous Networks
  - EIGRP
  - Border Gateway Protocol (BGP)
- Link-State Routing Protocol
  - Open Shortest Path First (OSPF)
  - Intermediate System to Intermediate System (IS-IS)
- IPv6 Routing Protocols
  - RIPv6
  - EIGRPV6
  - OSPFv3

Module 30: Switching and Virtual LANs (VLANs)

- Networking Before Layer 2 Switching
- Switching Services
  - Limitations of Layer 2 Switching
  - Bridging vs. LAN Switching
  - Three Switch Functions at Layer 2
- Spanning Tree Protocol (STP)
  - Spanning Tree Port States
  - STP Convergence
- Virtual LANs (VLANs)
  - VLAN Basics
  - VLAN Memberships
  - Static VLANs
  - Dynamic VLANs
  - Identifying VLANs
  - VLAN Identification Methods
- Switching and Network Security
  - Port Security/Authentication
  - How VLANs Enhance Network Security
- Two Additional Advanced Features of Switches
  - Power over Ethernet (PoE)
  - Port Mirroring/Spanning

Module 31: Wireless Technologies

- Introduction to Wireless Technology
- The 802.11 Standards
  - 2.4GHz (802.11b)
  - 2.4GHz (802.11g)
  - 5GHz (802.11a)
  - 5GHz (802.11n)
  - 2.4GHz/5GHz 802.11n
- Comparing 802.11 Standards
  - Wireless LAN Modulation Techniques
  - Range Comparisons
- Wireless Network Components
  - Wireless Access Points
  - Wireless Network Interface Card (NIC)
  - Wireless Antennas
- Installing a Wireless Network
  - Ad hoc Mode: Independent Basic Service Set (IBSS)
  - Infrastructure Mode: Basic Service Set (BSS)
  - Design Considerations with Large Wireless Networks
  - Installing and Configuring Hardware
- Wireless Security
  - Open Access
  - Service Set Identifiers (SSIDs), Wired Equivalent Privacy (WEP), and Media Access Control (MAC) Address Authentication
  - Remote Authentication Dial In User Service (RADIUS)
  - Temporal Key Integrity Protocol (TKIP)
  - Wi-Fi Protected Access (WPA) or WPA 2 Pre-Shared Key

Module 32: Authentication and Access Control

- Security Filtering
  - Access Control Lists
Module 33: Network Threats and Mitigation
- Recognizing Security Threats
  - Denial of Service (DoS)
  - Worms
  - Attackers and Their Tools
  - Rogue Access Points
  - Social Engineering Phishing
- Understanding Mitigation Techniques
  - Active Detection
  - Passive Detection
  - Proactive Defense
- Policies and Procedures
  - Security Policies
  - Security Training
  - Patches and Upgrades
  - Updating Antivirus Components
  - Fixing an Infected Computer

Module 34: Physical and Hardware Security
- Using Hardware and Software Security Devices
- Defining Firewalls
  - Network-Based Firewalls
  - Host-Based Firewalls
- Firewall Technologies
  - Access Control List (ACL)
  - Demilitarized Zone (DMZ)
  - Protocol Switching
  - Dynamic Packet Filtering
  - Proxy Services
- Firewalls at the Application Layer vs. the Network Layer
  - Stateful vs. Stateless Network-Layer Firewalls
  - Application-layer Firewalls
- Scanning Services and Other Firewall Features
  - Content Filtering
  - Signature Identification
  - Zones

Module 35: Wide Area Networks
- What’s a WAN?
  - Defining WAN Terms
  - The Public Switched Telephone Network (PSTN)
  - WAN Connection Types
  - Bandwidth or Speed
- T-Series Connections
  - The T1 Connection
  - The T3 Connection
- Transmission Media
  - Wired Connections
  - Wireless Technologies
- Broadband Services
  - DSL Technology and xDSL
  - Cable Modem
- WAN Protocols
  - Integrated Services Digital Network (ISDN)
  - Frame Relay Technology
  - Asynchronous Transfer Mode (ATM)
  - Multi Protocol Label Switching (MPLS)
Module 38: Network Troubleshooting

- Narrowing Down the Problem
  - Are There Any Cabling Issues? Did You Check the Super Simple Stuff?
  - Is Hardware or Software Causing the Problem?
  - Is it a Workstation or a Server Problem?
  - Which Segments of the Network Are Affected?
  - Is It Bad Cabling?
- Troubleshooting Steps
  - Step 1: Information Gathering - Identify Symptoms and Problems
  - Step 2: Identify the Affected Areas of the Network
  - Step 3: Define if Anything Has Changed
  - Step 4: Establish the Most Probable Cause
  - Step 5: Determine if Escalation Is Necessary
  - Step 6: Create an Action Plan and Solution, Identifying Potential Effects
  - Step 7: Implement and Test the Solution
  - Step 8: Identify the Results and Effects of the Solution
  - Step 9: Document the Solution and the Entire Process
- Troubleshooting Tips
  - Don't Overlook the Small Stuff
  - Prioritize Your Problems
  - Check the Software Configuration
  - Don't Overlook Physical Conditions
  - Don't Overlook Cable Problems
  - Check for Viruses

Module 39: Management, Monitoring, and Optimization

- Managing Network Documentation
  - Schematics and Diagrams
  - Baselines
  - Policies, Procedures, and Regulations
- Monitoring the Network and Optimizing Its Performance
  - Network Monitor and Logging
  - Reasons to Optimize Your Network’s Performance
  - How to Optimize Performance

Module 37: Software and Hardware Tools

- Understanding Network Scanners
  - Packet Sniffers
  - Intrusion Detection and Prevention Software (IDS/IPS)
  - Port Scanners
- Identifying Hardware Tools
  - Cable Tester
  - Protocol Analyzer
  - Certifiers
  - Time-Domain Reflectometer (TDR)
  - Optical Time-Domain Reflectometer (OTDR)
  - Multimeter
  - Toner Probe
  - Butt Set
  - Punch-Down Tool
  - Cable Stripper/Snips
  - Voltage Event Recorder
  - Temperature Monitor

Using the netstat Utility
- The -a Switch
- The -e Switch
- The -r Switch
- The -s Switch
- The -p Switch
- The -n Switch

Using the File Transfer Protocol (FTP)
- Starting FTP and Logging In to an FTP Server
- Downloading Files
- Uploading Files

Using the Telephone Network telnet Utility
- How to Enable Telnet in Vista
- Don't Use Telnet, Use Secure Shell (SSH)
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

Because human error is the number one cause for a network security breach, CompTIA Security+ is recognized by the technology community as a valuable credential that proves competency with information security. Many corporations recommend or require the Security+ certification for their IT employees. Network security is a major issue for corporations today and as the demand for secure networks grows, Security+ is quickly becoming the standard. CompTIA Security+ is the perfect addition to any networking career.

Audience Profile

This course is intended for students who want to acquire a solid foundation in computer security and who’s goal is to prepare for the CompTIA Security+ exam by learning how to develop and improve security. It’s designed for students who want to acquire hands-on skills and in-depth knowledge of computer security.

At Course Completion

After completing this course, students will be able to:

- Identify and help mitigate security risks—essential concepts
- Know and apply the basic principles of cryptography, keys, and certificates
- Monitor and help secure vulnerabilities in TCP/IP and network infrastructure
- Help protect e-mail, RAS, VPNs, wireless services, and other online communications
- Configure user and group privileges, access control, and authentication
- Implement security baselines, system updates, and intrusion detection
- Create an operational security plan—from physical security to business continuity
- Build an organizational security program—documentation, risk assessment

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1 - Measuring and Weighing Risk

- Risk Assessment
  - Computing Risk Assessment
  - Acting on Your Risk Assessment
  - Risks Associated with Cloud Computing
  - Risks Associated with Virtualization
- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines

Module 2 - Infrastructure and Connectivity

- Mastering TCP/IP 9
  - Working with the TCP/IP Suite
  - IPv4 vs. IPv6
  - Understanding Encapsulation
  - Working with Protocols and Services
Module 3 - Protecting Networks

- Monitoring and Diagnosing Networks
  - Network Monitors
  - Intrusion Detection Systems
- Understanding Intrusion Detection Systems
  - Working with a Network-Based IDS
  - Working with a Host-Based IDS
  - Working with NIPS
  - Utilizing Honeypots
- Understanding Protocol Analyzers
- Securing Workstations and Servers
- Securing Internet Connections
  - Working with Ports and Sockets
  - Working with Email
  - Working with the Web
  - Working with File Transfer Protocol
- Understanding Network Protocols

Module 4 - Threats and Vulnerabilities

- Understanding Software Exploitation
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Working with Business Requirements
- Understanding Infrastructure Security
  - Working with Hardware Components
  - Working with Software Components
- Understanding the Different Network Infrastructure Devices
  - Firewalls
  - Hubs
  - Modems
  - Remote Access Services
  - Routers
  - Switches
  - Load Balancers
  - Telecom/PBX Systems
  - Virtual Private Networks
  - Web Security Gateway
  - Spam Filters
- Understanding Remote Access
  - Using Point-to-Point Protocol
  - Working with Tunneling Protocols
- Understanding Network Protocols

Module 5 - Access Control and Identity Management

- Access Control Basics
  - Identification vs. Authentication
  - Authentication (Single Factor) and Authorization
  - Multifactor Authentication
  - Operational Security
  - Tokens
  - Potential Authentication and Access Problems
  - Authentication Issues to Consider
- Understanding Remote Access Connectivity
  - Using the Point-to-Point Protocol
  - Working with Tunneling Protocols
  - Working with RADIUS
  - TACACS/TACACS+/XTACACS
  - VLAN Management
- Understanding Authentication Services
  - LDAP
  - Kerberos
  - Single Sign-On Initiatives
- Understanding Access Control
  - Mandatory Access Control
  - Discretionary Access Control
  - Role-Based Access Control
  - Rule-Based Access Control
- Implementing Access Control Best Practices
  - Smart Cards
  - Access Control Lists
  - Trusted OS
  - Secure Router Configuration

Module 6 - Educating and Protecting the User

- Understanding Security Awareness and Training
  - Communicating with Users to Raise Awareness
  - Providing Education and Training
  - Training Topics
Module 7 - Operating System and Application Security
- Hardening the Operating System
  - The Basics of OS Hardening
  - Hardening Filesystems
  - Updating Your Operating System
- Application Hardening
  - Fuzzing
  - Cross-Site Request Forgery
  - Application Configuration Baselining
  - Application Patch Management
  - Making Your Network More Secure Through Hardening
- Working with Data Repositories
  - Directory Services
  - Databases and Technologies
  - Injection Problems
  - SQL Injection
  - LDAP Injection
  - XML Injection
  - Directory Traversal/Command Injection
- Host Security
  - Antimalware
  - Host Software Baselining
- Mobile Devices
- Best Practices for Security
  - URL Filtering
  - Content Inspection
  - Malware Inspection
  - Data Loss Prevention
  - Data Encryption
  - Hardware-Based Encryption Devices

Module 8 - Cryptography Basics
- An Overview of Cryptography
  - Understanding Non-mathematical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms
  - Wi-Fi Encryption
- Using Cryptographic Systems
  - Confidentiality
  - Integrity
  - Digital Signatures
  - Authentication
  - Non-repudiation
  - Access Control
  - Key Features
- Understanding Cryptography Standards and Protocols
  - The Origins of Encryption Standards
  - Public-Key Infrastructure X.509/Public-Key Cryptography Standards
  - X.509
  - SSL and TLS
  - Certificate Management Protocols
  - Secure Multipurpose Internet Mail Extensions
  - Secure Electronic Transaction
  - Secure Shell
  - Pretty Good Privacy
  - HTTP Secure
  - Secure HTTP
  - IP Security
  - Tunneling Protocols
  - Federal Information Processing Standard

Module 9 - Cryptography Implementation
- Using Public Key Infrastructure
  - Using a Certificate Authority
  - Working with Registration Authorities and Local Registration Authorities
  - Implementing Certificates
  - Understanding Certificate Revocation
  - Implementing Trust Models
- Preparing for Cryptographic Attacks
  - Ways to Attack Cryptographic Systems
  - Three Types of Cryptographic Attacks
Understanding Key Management and the Key Life Cycle
- Methods for Key Generation
- Storing and Distributing Keys
- Using Key Escrow
- Identifying Key Expiration
- Revoking Keys
- Suspending Keys
- Recovering and Archiving Keys
- Renewing Keys
- Destroying Keys
- Identifying Key Usage

Module 10 - Physical and Hardware-Based Security
- Implementing Access Control
  - Physical Barriers
  - Security Zones
  - Partitioning
  - Biometrics
- Maintaining Environmental and Power Controls
  - Environmental Monitoring
  - Power Systems
  - EMI Shielding
  - Hot and Cold Aisles
- Fire Suppression
  - Fire Extinguishers
  - Fixed Systems

Module 11 - Security and Vulnerability in the Network
- Network Security Threats
  - Penetration Testing
  - Vulnerability Scanning
  - Ethical Hacking
  - Assessment Types and Techniques
- Secure Network Administration Principles
  - Rule-Based Management
  - Port Security
  - Working with 802.1X
  - Flood Guards and Loop Protection
  - Preventing Network Bridging
  - Log Analysis
- Mitigation and Deterrent Techniques
  - Manual Bypassing of Electronic Controls
  - Monitoring System Logs
  - Security Posture
  - Reporting
  - Detection/Prevention Controls

Module 12 - Wireless Networking Security
- Working with Wireless Systems
  - IEEE 802.11 x Wireless Protocols
  - WEP/WAP/WPA/WPA2
  - Wireless Transport Layer Security

Module 13 - Disaster Recovery and Incident Response
- Understanding Mobile Devices
  - Wireless Access Points
  - Extensible Authentication Protocol
  - Lightweight Extensible Authentication Protocol
  - Protected Extensible Authentication Protocol
- Wireless Vulnerabilities to Know

Module 14 - Security-Related Policies and Procedures
- Policies You Must Have
  - Data Loss/Theft Policies
  - Least Privilege
  - Separation of Duties
  - Time of Day Restrictions
  - Mandatory Vacations and Job Rotation
- Policies You Should Have
  - Human Resource Policies
  - Certificate Policies
- Security Controls for Account Management
  - User and Group Role Management
  - Users with Multiple Accounts/Roles
  - Auditing
  - Account Policy Enforcement

Module 15 - Security Administration
- Security Administrator’s Troubleshooting Guide
- Getting Started
  - Creating a Home Lab
  - In the Workplace
  - Which OS Should You Use?
  - Creating a Security Solution
- Access Control Issues
- Accountability Concerns
- Auditing
- Authentication Schemes
  - Authentication Factors
  - Mutual Authentication
  - Authentication Protection
  - Backup Management
Baselining

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Security
Certificate Management
Communications Security
  - Preauthentication
  - Remote Control/Remote Shell
  - Virtual Private Networks
Directory Services Protection
Disaster Planning
Documenting Your Environment
Email Issues
File-Sharing Basics
Working with IDSs and Honey Pots
Incident Handling
Internet Common Sense
Key Management Conventions
Preventing Common Malicious Events
  - Constructing a Line of Defense
  - Types of Attacks
  - Antivirus Protection
  - Making Stronger Passwords
Managing Personnel
Keeping Physical Security Meaningful
Securing the Infrastructure
Working with Security Zones
Social Engineering Risks
System Hardening Basics
Securing the Wireless Environment
About this Course

CompTIA Security+ validates knowledge of systems security, network infrastructure, access control, assessments and audits, cryptography and organizational security. It is an international, vendor-neutral security certification that is taught at colleges, universities and commercial training centers around the world.

Because human error is the number one cause for a network security breach, CompTIA Security+ is recognized by the technology community as a valuable credential that proves competency with information security. Many corporations recommend or require the Security+ certification for their IT employees. Network security is a major issue for corporations today and as the demand for secure networks grows, Security+ is quickly becoming the standard. CompTIA Security+ is the perfect addition to any networking career.

Audience Profile

This course is intended for students who want to acquire a solid foundation in computer security and who’s goal is to prepare for the CompTIA Security+ exam by learning how to develop and improve security. It’s designed for students who want to acquire hands-on skills and in-depth knowledge of computer security.

At Course Completion

After completing this course, students will be able to:

- Identify and help mitigate security risks—essential concepts
- Know and apply the basic principles of cryptography, keys, and certificates
- Monitor and help secure vulnerabilities in TCP/IP and network infrastructure
- Help protect e-mail, RAS, VPNs, wireless services, and other online communications
- Configure user and group privileges, access control, and authentication
- Implement security baselines, system updates, and intrusion detection
- Create an operational security plan—from physical security to business continuity
- Build an organizational security program—documentation, risk assessment

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1: General Security Concepts

- Understanding Information Security
  - Securing the Physical Environment
  - Examining Operational Security
  - Working with Management and Policies
- Understanding the Goals of Information Security
- Comprehending the Security Process
  - Appreciating Antivirus Software
  - Implementing Access Control
  - Understanding Authentication

Module 2: Identifying Potential Risks

- Authentication issues to Consider
- Distinguishing between Security Topologies
  - Setting Design Goals
  - Creating Security Zones
  - Working with Newer Technologies
  - Addressing Business Concerns
  - Dealing with Telephony Issues

Calculating Attack Strategies
- Understanding Access Attack Types
Module 3: Infrastructure and Connectivity
- Recognizing Common Attacks
  - Recognizing Modification and Repudiation Attacks
  - Identifying Denial-of-Service and Distributed
  - Denial-of-Service Attacks

Module 2: Designing and Implementing Security
- Recognizing TCP/IP Security Concerns
  - Working with the TCP/IP Suite
  - Understanding Encapsulation
  - Working with Protocols and Services

Module 4: Monitoring Activity and Intrusion Detection
- Monitoring the Network
  - Recognizing the Different Types of Network Traffic
  - Monitoring Network Systems

Module 5: Implementing and Maintaining a Secure Network
- Overview of Network Security Threats
- Defining Security Baselines
- Hardening the OS and NOS
- Configuring Network Protocols
Module 6: Securing the Network and Environment

- Understanding Physical and Network Security
  - Implementing Access Control
  - Understanding Social Engineering
  - Scanning the Environment
- Understanding Business Continuity Planning
  - Undertaking Business impact Analysis
  - Assessing Risk
- Developing Policies, Standards, and Guidelines
  - Implementing Policies
  - Incorporating Standards
  - Following Guidelines
- Working with Security Standards and ISO 17799
- Classifying Information
  - Public Information
  - Private Information
  - Roles in the Security Process
  - Information Access Controls

Module 7: Cryptography Basics, Methods, and Standards

- An Overview of Cryptography
  - Understanding Physical Cryptography
  - Understanding Mathematical Cryptography
  - Working with Passwords
  - Understanding Quantum Cryptography
  - Uncovering the Myth of Unbreakable Codes
- Understanding Cryptographic Algorithms
  - The Science of Hashing
  - Working with Symmetric Algorithms
  - Working with Asymmetric Algorithms

Module 8: Security Policies and Procedures

- Understanding Business Continuity
  - Utilities
  - High Availability
  - Disaster Recovery
Module 9: Security Administration

- Reinforcing Vendor Support
  - Service-Level Agreements
  - Code Escrow Agreements
- Generating Policies and Procedures
  - Human Resource Policies
  - Business Policies
  - Certificate Policies
  - Incident-Response Policies
- Enforcing Privilege Management
  - User and Group Role Management
  - Privilege Escalation
  - Single Sign-On Initiatives
  - Privilege Decision Making
  - Auditing
  - Access Control

- Understanding Security Management
  - Drafting Best Practices and Documentation
- Simplifying Security Administration
- Understanding Security Awareness and Education
  - Using Communication and Awareness
  - Providing Education
- Staying on Top of Security
  - Websites
  - Trade Publications
- Regulating Privacy and Security
  - The Health Insurance Portability and Accountability Act
  - The Gramm-Leach-Bliley Act of 1999
  - The Computer Fraud and Abuse Act
  - The Family Educational Rights and Privacy Act
  - The Computer Security Act of 1987
  - The Cyberspace Electronic Security Act
  - The Cyber Security Enhancement Act
  - The Patriot Act
  - Familiarizing Yourself with International Efforts
CompTIA Linux+ Powered by LPI is a high-stakes, vendor-neutral certification that validates the fundamental knowledge and skills required of junior Linux administrators.

The two leading Linux certification bodies, CompTIA and Linux Professional Institute (LPI), have joined forces to release two new Linux+ exams, LX0-101 and LX0-102. This training course breaks down everything you need to prepare for the exams. Covering all exam objectives, the course will teach you Linux command-line tools, managing software, configuring hardware, managing files and file systems, and much more.

**Audience Profile**

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration, or to prepare for the CompTIA Linux+ Powered by LPI (Exams LX0-01, LX0-102).

At Course Completion

After completing this course, students will be able to:

- Implement Linux command-line tools
- Manage software
- Configure hardware
- Understand boot process and scripts
- Manage files and file systems
- Administer the Windows X system- networking, server and system security

**Prerequisites**

CompTIA A+ certification, or the equivalent skills and knowledge, is helpful but not required.

**Course Outline**

**Module 1: Exploring Linux Command-Line Tools**

- Understanding Command-Line Basics Exploring Your Linux Shell Options
  - Using a Shell
  - Exploring Shell Configuration
  - Using Environment Variables
  - Getting Help
  - Using Streams, Redirection, and Pipes
  - Exploring Types of Streams
  - Redirecting Input and Output
  - Piping Data Between Programs
  - Generating Command Lines
  - Processing Text Using Filters
  - File-Combining Commands
  - File-Transforming Commands

- File-Formatting Commands
- File-Viewing Commands
- File-Summarizing Commands
- Using Regular Expressions
- Understanding Regular Expressions
- Using grep
- Using sed

**Module 2: Managing Software**

- Package Concepts
- Using RPM
- RPM Distributions and Conventions
- The rpm Command Set
- Extracting Data from RPMs
- Using Yum
- RPM and Yum Configuration Files
CTIA-1104: CompTIA Linux+

Module 3: Configuring Hardware
- Configuring the BIOS and Core Hardware
- Understanding the Role of the BIOS
- IRQs
- I/O Addresses
- DMA Addresses
- Boot Disks and Geometry Settings
- Coldplug and Hotplug Devices
- Configuring Expansion Cards
- Configuring PCI Cards
- Learning about Kernel Modules
- Loading Kernel Modules
- Removing Kernel Modules
- Configuring USB Devices
- USB Basics
- Linux USB Drivers
- USB Manager Applications
- Configuring Hard Disks
- Configuring PATA Disks
- Configuring SATA Disks
- Configuring SCSI Disks
- Configuring External Disks
- Designing a Hard Disk Layout
- Why Partition?

Module 4: Managing Files
- Managing Files
- File Naming and Wildcard Expansion Rules
- File Commands
- File Archiving Commands
- Managing Links
- Directory Commands
- Managing File Ownership
- Assessing File Ownership
- Changing a File’s Owner
- Changing a File’s Group
- Controlling Access to Files
- Understanding Permissions
- Changing a File’s Mode
- Setting the Default Mode and Group
- Changing File Attributes
- Managing Disk Quotas
- Enabling Quota Support
- Setting Quotas for Users
- Locating Files
- The FHS
- Tools for Locating Files

Module 5: Booting Linux and Editing Files
- Installing Boot Loaders
- Boot Loader Principles
- Using LILO as the Boot Loader
- Using GRUB as the Boot Loader
- Understanding the Boot Process
- Extracting Information about the Boot Process
- Locating and Interpreting Boot Messages
- The Boot Process
- Dealing with Runlevels and the Initialization Process
- Runlevel Functions
- Identifying the Services in a Runlevel
Module 7: Administering the System

- Managing Runlevel Services
- Checking Your Runlevel
- Changing Runlevels on a Running System
- Editing Files with Vi
- Understanding Vi Modes
- Exploring Basic Text-Editing Procedures
- Saving Changes

Module 8: Configuring Basic Networking

- Understanding TCP/IP Networking
- Knowing the Basic Functions of Network Hardware
- Investigating Types of Network Hardware
- Understanding Network Packets
- Understanding Network Protocol Stacks
- Knowing TCP/IP Protocol Types
- Understanding Network Addressing
- Using Network Addresses
- Resolving Hostnames
- Network Ports
- Configuring Linux for a Local Network
- Network Hardware Configuration
- Configuring with DHCP
- Configuring with a Static IP Address
- Configuring Routing
- Using GUI Configuration Tools
- Using the ifup and ifdown Commands
- Configuring Hostnames
- Diagnosing Network Connections
- Testing Basic Connectivity
- Tracing a Route
- Checking Network Status
- Examining Raw Network Traffic
- Using Additional Tools

Module 9: Writing Scripts, Configuring E-mail, and Using Databases

- Managing the Shell Environment
- Reviewing Environment Variables
- Understanding Common Environment Variables
- Using Aliases
- Modifying Shell Configuration Files
- Writing Scripts
- Beginning a Shell Script
- Using Commands
- Using Variables
- Using Conditional Expressions
- Using Loops
- Using Functions
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The CompTIA Server+ certification is an international vendor neutral credential that validates skills and knowledge needed to build and support server hardware.

**Required Exams**

To earn the CompTIA Server+ certification, students must pass exam SK0-003.

**Audience Profile**

This course is intended for students seeking to earn the CompTIA Server+ certification and who need an expert instructor to guide them throughout the training and exam preparation process.

**At Course Completion**

After completing this course, students will have the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. Students will be able to:

- Identify environmental issues
- Understand and comply with disaster recovery and physical / software security procedures
- Be familiar with industry terminology and concepts
- Understand server roles / specializations and interaction within the overall computing environment.

**Prerequisites**

The CompTIA Server+ certification is targeted towards individuals with 18-24 months of IT experience. Although not a prerequisite, it is recommended that CompTIA Server+ candidates hold a CompTIA A+ certification.

**Course Outline**

1.0 System Hardware

1.1 Differentiate between system board types, features, components and their purposes.

- Dip switches / jumpers
- Processor (single and multi)
- Bus types and bus speeds
- On board components
- Expansion slots
- BIOS
- Riser Card / backplane
- Storage connectors

1.2 Deploy different chassis types and the appropriate components

- Cooling
- Form Factor (tower, rack, blade)
- Power
- Redundant power
- Shut off switches – chassis intrusion
- Power buttons
- Reset buttons
- Diagnostic LEDs
- Expansion bays
1.3 Differentiate between memory features / types and given a scenario select appropriate memory
- Memory pairing
- ECC vs. non-ECC
- Registered vs. non-registered
- RAID and hot spares
- Types
- Memory compatibility
- On board vs. riser card

1.4 Explain the importance of a Hardware Compatibility List (HCL)
- Vendor standards for hardware
- Memory and processor compatibility
- Expansion cards compatibility
- Virtualization requirements

1.5 Differentiate between processor features / types and given a scenario select the appropriate processor
- Multicore
- Multiprocessor
- Cache levels
- Stepping
- Speed
- VRMs
- Execute disable (XD) or not execute (NX)
- Hyper-Threading
- VT or AMD-V
- AMD vs. Intel (non-compatible CPUs)
- Processor architecture (RISC, CISC)
- Vendor slot types
- 64bit vs. 32bit
- Heat dissipation (heat sinks, fans, liquid cooling)

1.6 Given a scenario, install appropriate expansion cards into a server while taking fault tolerance into consideration.
- Manufacturer specific
- HBAs
- NICs
- Video
- Audio
- Storage controller (SCSI, SATA, RAID)
- Port expansion cards

1.7 Install, update and configure appropriate firmware.
- Driver / hardware compatibility
- Implications of a failed firmware upgrade (redundant BIOS)
- Follow manufacturer instructions and documentation

2.0 Software

2.1 Install, deploy, configure and update NOS (Windows / *nix).
- Installation methods (optical media, USB, network share, PXE)
- virtualization templates)
- Bootloader
- File systems
- Driver installation
- Configure NOS
- Patch management

2.2 Explain NOS security software and its features.
- Software firewall
- Malware protection software
- Basics of file level permissions vs. share permissions

2.3 Given a scenario, implement and administer NOS management features based on procedures and guidelines
- User management
- Resource management
- Monitoring (tools and agents)

2.4 Explain different server roles, their purpose and how they interact
- File and print server
- Database server
- Web server
- Messaging server
- DHCP server
- Directory services
- DNS server
- Application server
- Remote access server
- Virtualized services
- NTP server
- Explain the different between a workstation, desktop and a server
- Server shut down and start up sequence (one server vs. multiple servers vs. attached components)

2.5 Summarize server virtualization concepts, features and considerations
- Resource utilization
- Configuration
- Interconnectivity
- Management server
- Reasons for virtualization

2.6 Describe common elements of networking essentials
- TCP/IP
- Ethernet
- VPN
- VLAN
- DMZ
3.0 Storage

3.1 Describe RAID technologies and its features and benefits
- Hot spare
- Software vs. hardware
- Cache read/write levels (data loss potential)
- Performance benefits and tradeoffs

3.2 Given a scenario, select the appropriate RAID level
- 0, 1, 3, 5, 6, 10, 50
- Performance benefits and tradeoffs

3.3 Install and configure different internal storage technologies
- Hot swappable vs. non-hot swappable
- SCSI, Ultra SCSI, Ultra320 (termination), LUNs
- SAS, SATA
- Tape
- Optical
- Flash
- Floppy (USB)
- Controller (firmware levels)
- Hard drive (firmware, JBOD)

3.4 Summarize the purpose of external storage technologies
- Network attached storage
- Storage area network
- Tape library
- WORM
- Optical jukebox
- Transport media

4.0 IT Environment

4.1 Write, utilize and maintain documentation, diagrams and procedures
- Follow pre-installation plan when building or upgrading servers
- Labeling
- Diagram server racks and environment topologies
- Hardware and software upgrade, installation, configuration, server role and repair logs
- Document server baseline (before and after service)
- Original hardware configuration, service tags, asset management and warranty
- Vendor specific documentation

4.2 Given a scenario, explain the purpose of the following industry best practices
- Follow vendor specific server best practices
- Explore ramifications before implementing change – determine organizational impact
- Communicate with stakeholders before taking action and upon completion of action
- Comply with all local laws / regulations, industry and corporate regulations

4.3 Determine an appropriate physical environment for the server location
- Check for adequate and dedicated power, proper amperage and voltage communication and shut down, proper monitoring
- Server cooling considerations – HVAC

4.4 Implement and configure different methods of server access
- KVM (local and IP based)
- Direct connect

4.5 Given a scenario, classify physical security measures for a server location
- Physical server security
- Access control devices (RFID, keypads, pinpads)
- Security procedures
- Defense in-depth – multiple layers of defense
- Reasons for physical security
- Secure documentation related to servers

5.0 Disaster Recovery

5.1 Compare and contrast backup and restoration methodologies, media types and concepts
- Methodologies (full, incremental, differential, selective)
- Media types
- Backup security and off-site storage
- Importance of testing the backup and restoration process

5.2 Given a scenario, compare and contrast the different types of replication methods
- Disk to disk
- Server to server
- Site to site
- Site types

5.3 Explain data retention and destruction concepts
- Awareness of potential legal requirements
- Awareness of potential company policy requirements
- Differentiate between archiving and backup

5.4 Given a scenario, carry out the following basic steps of a disaster recovery plan
- Disaster recovery testing process
- Follow emergency procedures (people first)
- Use appropriate fire suppressants
- Follow appropriate fire suppressants
- Classification of systems (prioritization during recovery)
6.0 Troubleshooting

6.1 Explain troubleshooting theory and methodologies

- Identify the problem and determine the scope environment
- Establish a theory of probable cause (question the obvious) multiple problems
- Test the theory to determine cause
- Establish a plan of action to resolve the problem and notify impacted users
- Implement the solution or escalate as appropriate resolved the problem
- Implement new change
- Verify full system functionality and if applicable implement preventative measures
- Perform a root cause analysis
- Document findings, actions and outcomes throughout the process

6.2 Given a scenario, effectively troubleshoot hardware problems, selecting the appropriate tools and methods

- Common problems
- Causes of common problems
- Environmental issues
- Hardware tools

6.3 Given a scenario, effectively troubleshoot software problems, selecting the appropriate tools and methods

- Common problems
- Cause of common problems
- Software tools

6.4 Given a scenario, effectively diagnose network problems, selecting the appropriate tools and methods

- Common problems
- Causes of common problems
- Networking tools

6.5 Given a scenario, effectively troubleshoot storage problems, selecting the appropriate tools and methods

- Common problems
- Causes of common problems
- Storage tools
CompTIA Advanced Security Professional
(CASP)

Course#: CTIA-2107
Exams: CAS-001

Length: 5 days
Audience: IT Professionals
Level: 300
Type: Day Course
Delivery Method: Instructor-Led Classroom

About this Course

The CASP certification is an international, vendor-neutral exam that proves competency in enterprise security; risk management; research and analysis; and integration of computing, communications, and business disciplines.

The exam covers the technical knowledge and skills required to conceptualize, design, and engineer secure solutions across complex enterprise environments. It involves applying critical thinking and judgment across a broad spectrum of security disciplines to propose and implement solutions that map to enterprise drivers. For more detailed information,

The CompTIA Advanced Security Practitioner certification was accredited by the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI) on Dec. 13, 2011.

Students will examine advanced security concepts, principles, and implementations that pertain to enterprise-level security.

The CompTIA CASP requires one test: CAS-001

Audience Profile

This course is targeted toward an IT professional that has the technical knowledge and skills required to conceptualize, design, and engineer secure solutions across complex enterprise environments. Students aspiring to CASP certification should have a minimum of 10 years experience including at least five years of hands-on technical security experience.

At Course Completion

Upon successful completion of this course, students will be able to:

● Identify enterprise security fundamentals.
● Apply enterprise security technology solutions.
● Identify enterprise resource technologies and the potential security implications for these resources.
● Design security solutions.
● Identify application security design issues such as best practices for development and testing as well as threat mitigation techniques.
● Manage risk, security policies, and security procedures within an enterprise.
● Integrate security solutions within an enterprise.
● Conduct security research and analysis.

Prerequisites

While there are no strict prerequisites, CompTIA intends the CASP certification to serve as an add-on to the CompTIA® Security+® certification, or equivalent technical experience.

Recommended courses (or the equivalent certifications):

● CompTIA® Security+® is strongly recommended.
● CompTIA® A+® Certification
Course Outline

Lesson 1: The Enterprise Security Architecture
- Topic 1A: The Basics of Enterprise Security
- Topic 1B: The Enterprise Structure
- Topic 1C: Enterprise Security Requirements

Lesson 2: Enterprise Security Technology
- Topic 2A: Common Network Security Components and Technologies
- Topic 2B: Communications and Collaboration Security
- Topic 2C: Cryptographic Tools and Techniques
- Topic 2D: Advanced Authentication

Lesson 3: Enterprise Resource Technology
- Topic 3A: Enterprise Storage Security Issues
- Topic 3B: Distributed, Shared, and Virtualized Computing
- Topic 3C: Cloud Computing and Security

Lesson 4: Security Design and Solutions
- Topic 4A: Network Security Design
- Topic 4B: Conduct a Security Assessment
- Topic 4C: Host Security

Lesson 5: Application Security Design
- Topic 5A: Application Security Basics
- Topic 5B: Web Application Security

- Topic 6A: Analyze Security Risk
- Topic 6B: Implement Risk Mitigation Strategies and Controls
- Topic 6C: Implement Enterprise-Level Security Policies and Procedures
- Topic 6D: Prepare for Incident Response and Recovery

Lesson 7: Enterprise Security Integration
- Topic 7A: The Technology Life Cycle
- Topic 7B: Inter-Organizational Change
- Topic 7C: Integrate Enterprise Disciplines to Achieve Secure Solutions

Lesson 8: Security Research and Analysis
- Topic 8A: Perform an Industry Trends and Impact Analysis
- Topic 8B: Perform an Enterprise Security Analysis
The program is a 3-day, instructor-led course that:

- Provides a comprehensive overview of all of the ITIL disciplines, including objectives, terminology, responsibilities, and critical success factors
- Prepares the attendee to take the ITIL V3 Foundation certification examination
- Helps the attendee to leverage the ITIL V3 disciplines and practices in their work environment

**Audience Profile**

The ITIL V3 Foundation training course is an introductory-level course. It is offered to professionals responsible for leading, building, supporting, and operating the information technology services delivery aspects of their organizations IT infrastructure or to consulting and other business professionals who need to upgrade their skills.

**At Course Completion**

On completion of the ITIL V3 Foundation Training Course attendees will be ready to take the certification examination leading to the Information Technology Infrastructure Library Foundation Certificate. This is a forty question, multiple-choice examination lasting one hour. Attendees would also have the learning foundation necessary to begin or carry-on the process of ITIL discipline implementation in any organization.

**Study Materials**

This course includes handouts and references useful after the class, as well as practice sessions, quizzes, exam strategies, and test-taking tips. The one-hour ITIL v3 Foundation exam will be offered on the last day of class.

**Prerequisites**

There are no prerequisites for this course. However some knowledge of service management terminology and concepts would be helpful.

**Course Outline**

This course will cover the fundamentals of the service lifecycle phases of ITIL V3. The curriculum is as follows:

- Introduction to ITIL and ITSM
- Service Strategy
- Service Design
- Service Transition
- Service Operation
- Service Improvement
- ITIL Foundation Certificate Examination

These disciplines represent a service lifecycle framework that further enhances alignment to the business while demonstrating business value and ROI and enabling IT to solve specific operational needs.
Fundamentals of the Java Programming Language, Java SE 6
Course#: JAVA-1102

Length: 5 days
Audience: Developers
Technology: Java SE6
Type: Course
Delivery Method: Instructor-led, classroom

About this Course

The Fundamentals of the Java Programming Language course was designed to enable students with little or no programming experience to begin to learn programming using the Java programming language. The course teaches the significance of object-oriented programming, the keywords and constructs of the Java programming language, and the steps required to create simple Java technology programs. Students taking this course can receive a solid basis in the Java programming language upon which to base continued work and training.

Audience Profile

- Beginners to programming who have basic mathematical, logical, and analytical problem-solving skills and who want to begin learning the Java programming language. This includes technical writers, web developers, technical managers, and individuals with a technical, non-programming background, such as system administrators
- Novice programmers and those programmers who prefer to start learning the Java programming language at an introductory level.
- Students who wish to begin their study of the Sun Certified Java Associate (SCJA) exam

At Course Completion

After completing this course, students will be able to:

- Demonstrate knowledge of Java technology, the Java programming language, and the product life cycle
- Use various Java programming language constructs to create several Java technology applications
- Use decision and looping constructs and methods to dictate program flow
- Implement intermediate Java technology programming and object-oriented (OO) concepts in Java technology programs

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Module 1: Explaining Java Technology
- Describe key concepts of the Java programming language
- List the three Java technology product groups
- Summarize each of the seven stages of the product life cycle

Module 2: Analyzing a Problem and Designing a Solution
- Analyze a problem using object-oriented analysis
- Design classes from which objects will be created

Module 3: Developing and Testing a Java Technology Program
- Identify the four components of a class in the Java programming language
- Use the main method in a test class to run a Java technology program from the command line
- Compile and execute a Java technology program

Module 4: Declaring, Initializing, and Using Variables
- Identify the use the syntax for variables and define the syntax for a variable
- List the eight Java programming language primitive data types
- Declare, initialize, and use variables and constants according to Java programming language guidelines and coding standards
- Modify variable values using operators
- Use promotion and type casting

Module 5: Creating and Using Objects
- Declare, instantiate, and initialize object reference variables
- Compare how object reference variables are stored in relation to primitive variables
- Use a class (the String class) included in the Java Software Developer Kit (SDK)
- Use the Java 2 Platform, Standard Edition (J2SE[TM]) class library specification to learn about other classes in this application programming interface (API)
Module 6: Using Operators and Decision Constructs
- Identify relational and conditional operators
- Create if and if/else constructs
- Use the switch construct

Module 7: Using Loop Constructs
- Create while loops
- Develop for loops
- Create do/while loops

Module 8: Developing and Using Methods
- Describe the advantages of methods and define worker and calling methods
- Declare and invoke a method
- Compare object and static methods

Module 9: Implementing Encapsulation and Constructors
- Use encapsulation to protect data
- Create constructors to initialize objects

Module 10: Creating and Using Arrays
- Code one-dimensional arrays
- Set array values using length attribute and a loop
- Pass arguments to the main method for use in a program
- Create two-dimensional arrays

Module 11: Implementing Inheritance
- Define and test your use of inheritance
- Explain abstraction
- Explicitly identify class libraries used in your code
About this Course

This hands-on instructor-led course is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in Linux commands and the Linux Environment. Linux is used for the hands on labs in this course and this course is applicable for all UNIX and Linux variants including HP-UX, AIX, Solaris, Caldera and Red Hat.

At Course Completion

After completing this course, students will be able to:

- Navigating Linux environment
- Commonly used commands
- Process Control
- Linux file system management
- Linux file related commands
- Text filtering and processing
- Printing and backups
- Using the vi Editor

Prerequisites

There are no prerequisites for attending the course.

Course Outline

Introduction to Linux

- UNIX History
- The UNIX Layers
- The Shell
- Shell Versions
- Shell Prompts

Logging In and Looking Around

- Logging In
- Password Maintenance: passwd
- Special Keys Assignment: stty
- Changing stty Assignments
- Other stty Assignments
- Control Key Values
- Manual Help: man
- Man Page Description
- Man Page Sections
- Paging Output: pg
- Login Profile: .profile

Process Control

- Users and Processes: who
- Displaying the Process: ps
- ps options
- Background Processing: bg, fg
- Job Priorities: nice
- Killing a Process: kill

Shell Substitutions

- stdin, stdout, stderr
- Input Redirection: <file
- Output Redirection: >file
- Variable Types
- Exporting Local Variables: export
- Viewing Variables: echo
- Variable Substitution: $name
- Escaping Characters: /char
- Escaping Variable Names: $(name)
- Command Substitution: `cmd`
The UNIX File System

- Directory Listings: ls
- ls Switches
- Important Directories
- Absolute & Relative Paths
- $HOME and $PATH
- Directory Commands: pwd, cd, mkdir, rmdir
- Disk Usage: df
- File Types
- Links: ln
- File Permissions: r,w,x
- Permission Bits
- Changing Permissions: chmod, chown, chgrp

File Related Commands

- Finding Files: find
- Options For find
- Removing Files: rm
- Moving Files: mv
- Copying Files: cp
- Touching a File: touch
- Concatenating Files: cat
- Seeing the Beginning: head
- Seeing the Ending: tail
- Counting Word & Lines: wc

Text Filtering and Processing

- Cutting Out Data: cut
- Examples Using cut
- Locating Text Within Files: grep
- Examples Using grep
- To See the Interim Data: tee
- Sorting Data: sort
- Examples Using sort
- Translating Data: tr
- Splitting Long Lines: fold

Printing and Backups

- The Print Spooler
- Submitting a Print Request: lp
- Examples of lp
- Viewing the Print Queue: lpstat
- Canceling a Print Request: cancel
- Backups using tar
- Examples of tar
- The Copy I/O Archive: cpio
- cpio Options
- Examples of cpio
- Direct Device Copying: dd
- compress and uncompress

The vi Editor

- The Benefits of vi
- Workspace
- Starting vi
- Modes
- A Sample vi Screen
- vi Line Text Movement
- vi Line Positioning
- vi Page Positioning
- vi Search Patterns
- vi Text Insert
- vi Text Modify
- vi Move/Copy Text
- sx End/Edit Another
- sx Command Syntax
- sx Commands
- Regular Expressions
- Miscellaneous
- Some Set Options
About this Course

This hands-on instructor-led course, the companion course to Linux Fundamentals is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in setting up Shell Scripts and builds the Linux knowledge acquired in Linux Fundamentals. Bourne Again Shell (BASH) is used for the hands-on portion of the course. Students will also see examples of other Shells, including C, Born and Korn Shell.

At Course Completion

After completing this course, students will be able to:

- Shell data types
- Branch and Loop techniques
- Running a Shell script
- Data input
- Trace and Traps
- Shell scripting optimization

Prerequisites

Students should have taken course LIN-2101: Linux Fundamentals or have equivalent experience with Linux.

Course Outline

Shell Basics

- Startup Files
- Running a Script
- Print v Echo
- I/O Streams
- Command Grouping
- Arguments to a Script
- Some Other Special Variables
- Patterns

Shell Variables’ Data Types

- Variable Basics
- Substring Deletion
- Typeset
- Integers
- Arithmetic Operators
- Arrays
- Setting Multiple Elements

Branch and Loop

- Tests and Comparisons
- String and Number Tests
- File/Directory Tests
- Permission, Misc. Tests
- The exit Statement
- The if Statement
- The case Statement
- The while Loop
- The until Loop
- The for Loop
- Break from a Loop
- Continue Next Iteration

Running a Script

- Print v Echo
- I/O Streams
- Command Grouping
- Arguments to a Script
- Some Other Special Variables
- Patterns
**COURSE OUTLINE**

**Data Input**
- Read Data
- Here Document Data
- Menu Selection
- select Example
- Get Command Arguments
- getopts

**Trace and Traps**
- Turning Trace On
- Traps
- Functions
- Permanence and Pervasiveness
- Formatted Printing
- Conditions and Loops
- Do Loops
- Arrays

**Shell Scripting Optimization**
- Patterns
- Setting Default Values
- Substring Deletion
- Arithmetic Operators
- String and Number Tests
- File/Directory Tests
- Permission, Misc. Tests
- Line Text Movement
- Line Positioning
- Page Positioning
- Search Patterns
- Text Insert
- Text Modify
- Move/Copy Text
- End/Edit Another
- rx Commands
About this Course

This course combines Linux Fundamentals and the companion Linux Shell scripting into a 5 day class. This hands-on instructor-led course is designed to give application developers, network administrators, system engineers, tech support professionals and all Linux users a solid foundation in Linux commands and the Linux Environment and setting up shell scripts to automate system admin tasks. This is the introduction to the UNIX and Linux environment Linux is used for the hands on labs in this course and this course is applicable for all UNIX and Linux variants including HP-UX, AIX, Solaris, Caldera and Red Hat.

At Course Completion

After completing this course, students will be able to:

- Navigating Linux environment
- Commonly used commands
- Process Control
- Linux file system management
- Linux file related commands
- Text filtering and processing
- Printing and backups
- Using the vi Editor
- Shell data types
- Branch and Loop techniques
- Running a Shell script
- Data input
- Trace and Traps
- Shell scripting optimization

Prerequisites

There are no prerequisites for attending the course.

Course Outline

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- Putting Text Together: paste
- Examples Using paste

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- cpio Options
- Examples of cpio
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- Text Modify
- Move/Copy Text
- End/Edit Another
- ex Commands
Successfully managing a project requires effective planning and adherence to the industry's best practices in every step of the process. By understanding the fundamentals of project management, you will be better prepared to initiate a project in your organization and position it for success. In this course, you will identify effective project management practices and their related processes.

Course Objective: You will examine the elements of sound project management and apply the generally recognized practices to successfully manage projects.

This course features an Instructor led, group-paced, classroom-delivery learning model with structured hands-on activities.

Audience Profile
This course is designed for individuals whose primary job is not project management, but who manage projects on an informal basis. Also, anyone who is considering a career path in project management and desiring a complete overview of the field and its generally accepted practices can take up this course.

At Course Completion
Upon successful completion of this course, students will be able to:

- identify the key processes and requirements of project management.
- initiate a project.
- plan for time and cost.
- plan for project risks, communication, and change control.
- manage a project.
- execute the project closeout phase.

Prerequisites
To ensure your success, it is recommended that you first take the following course: Microsoft® Office Word® 2007 or 2010: Level 1; or have equivalent knowledge. Some on-the-job experience in participating in managed projects would be preferable.

Course Outline

Lesson 1: Getting Started with Project Management
- Describe a Project
- Describe the Project Management Life Cycle
- Identify the Role of a Project Manager

Lesson 2: Initiating a Project
- Determine the Scope of a Project
- Identify the Skills for a Project Team
- Identify the Risks to a Project

Lesson 3: Planning for Time and Cost
- Create a Work Breakdown Structure
- Sequence the Activities
- Create a Project Schedule
- Determine Project Costs

Lesson 4: Planning for Project Risks, Communication, and Change Control
- Analyze the Risks to a Project
- Create a Communication Plan
- Plan for Change Control
Lesson 5: Managing a Project
- Begin Project Work
- Execute the Project Plan
- Track Project Progress
- Report Performance
- Implement Change Control

Lesson 6: Executing the Project Closeout Phase
- Close a Project
- Create a Final Report
About this Course

This course will prepare you to identify and apply generally recognized practices in project management.

Audience Profile

The target student for this course is any individual who may need to perform project management activities in their job role on either a formal or informal basis, or any project team members who want to enhance their knowledge of project management in order to interact more productively with a project manager and perform more effectively on a project team.

At Course Completion

Upon successful completion of this course, students will be able to:

- identify the basic concepts and terminology of professional project management.
- launch a project.
- estimate project work.
- create a project schedule.
- plan project costs.
- plan for project risks.
- plan for project quality and compliance.
- manage human resources for your project.
- manage project procurements.
- plan for change management and monitor the project scope.
- monitor and optimize project schedule and cost.
- monitor quality of project work and the risks involved.
- plan communication strategies and manage stakeholder relationships.
- perform project closure.

Prerequisites

Work experience with project management and knowledge of the roles, responsibilities, and skills required for project management is needed. Also, basic working knowledge of office productivity tools is required. The Project Management Fundamentals course is recommended for students as a prerequisite to this course.

Course Outline

Lesson 1: Getting Started with Project Management
- Project Management Basics
- Factors Influencing a Project

Lesson 2: Launching Projects
- How Organizations Choose the Right Project
- Identify Project Stakeholders and Their Expectations
- Identify the Project Scope
- Prepare a SOW
- Formally Authorize a Project

Lesson 3: Estimating Project Work
- Estimate Project Effort and Resources Using Top-Down Estimation
- Estimate Project Effort and Resources Using Bottom-Up Estimation
- Reduce Risks in Project Estimates

Lesson 4: Creating a Project Schedule
- Illustrate Project Flow
- Identify Activity Resources
- Schedule Project Work
Lesson 5: Planning Project Costs
- Estimate Project Costs
- Establish the Cost Baseline
- Reconcile Funding and Costs

Lesson 6: Planning for Risks
- Create a Risk Management Plan
- Identify Risks and Their Causes
- Analyze Risks
- Develop a Risk Response Plan

Lesson 7: Planning for Quality and Compliance
- Deliver the Desired Project Results
- Verify Compliance Requirements

Lesson 8: Managing Human Resources
- Plan Your Dream Team
- Put the Team Together
- Build the Team
- Manage the Team

Lesson 9: Managing Project Procurements
- Plan for Project Procurements
- Obtain Responses from Vendors
- Choose the Right Vendor
- Manage Vendors and Procurements

Lesson 10: Managing Change During Project Execution
- Gear Up for Project Execution
- Manage Project Changes
- Monitor the Project Scope

Lesson 11: Monitoring and Controlling Project Schedule and Cost
- Monitor and Control the Project Schedule
- Optimize the Project Schedule
- Monitor and Control Project Costs

Lesson 12: Monitoring Risk and Quality
- Monitor and Control Risks
- Put Quality Plans into Action
- Control Project Quality

Lesson 13: Communicating and Reporting
- Communicate in a Project
- Distribute Project Information
- Manage Stakeholder Relationships and Expectations
- Report on Project Performance

Lesson 14: Closing the Project
- Hand Off the Project
- Close Project Procurements
- Wrap Up a Project
You will apply the generally recognized practices of project management acknowledged by the Project Management Institute (PMI®) to successfully manage projects.

**Audience Profile**

This course is designed for persons who have on the job experience performing project management tasks, whether or not project manager is their formal job role, who are not certified project management professionals, and who might or might not have received formal project management training. The course is appropriate for these persons if they wish to develop professionally, increase their project management skills, apply a formalized and standards-based approach to project management, seek career advancement by moving into a formal project manager job role, as well as to apply for Project Management Institute, Inc. (PMI®) Project Management Professional (PMP®) Certification.

**At Course Completion**

Upon successful completion of this course, students will be able to:

- describe professional project management.
- initiate a project.
- plan project work.
- develop project schedules.
- develop cost estimates and budgets.
- plan project quality, staffing, and communications.
- analyze risks and plan risk responses.
- plan project procurements.
- execute project work.
- manage project procurement.
- monitor and control project work.
- monitor and control project schedule and costs.
- monitor and control project performance and quality.
- monitor and control project risks and procurements.
- close the project.

**Prerequisites**

Familiarity with project management concepts and some working experience with project management are required. Experience with a specific project management software tool is not required.

- Microsoft Word Level 1 is required.
- Project Management Fundamentals is recommended.
## Course Outline

### Lesson 1: Examining Professional Project Management
- Identify Project Management Processes
- Identify Professional and Social Responsibilities
- Identify the Interpersonal Skills Required for a Project Manager

### Lesson 2: Initiating a Project
- Examine the Project Management Context
- Examine Project Selection
- Prepare a Project Statement of Work
- Create a Project Charter
- Identify Project Stakeholders

### Lesson 3: Planning Project Work
- Identify the Elements of a Project Management Plan
- Document Stakeholder Requirements
- Create a Scope Statement
- Develop a Work Breakdown Structure

### Lesson 4: Developing Project Schedules
- Create an Activity List
- Create a Project Schedule Network Diagram
- Estimate Activity Resources
- Estimate Duration for Project Activities
- Develop a Project Schedule
- Identify the Critical Path
- Optimize the Project Schedule
- Establish a Schedule Baseline

### Lesson 5: Developing Cost Estimates and Budgets
- Estimate Project Costs
- Estimate the Cost Baseline
- Reconcile Funding and Costs

### Lesson 6: Planning Project Quality, Staffing, and Communications
- Create a Quality Management Plan
- Document the Project Roles, Responsibilities, and Reporting Relationships
- Create a Communications Management Plan

### Lesson 7: Analyzing Risks and Planning Risk Responses
- Examine a Risk Management Plan
- Identify Project Risks and Triggers
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Develop a Risk Response Plan

### Lesson 8: Planning Project Procurements
- Plan Project Procurements
- Prepare a Procurement Statement of Work
- Prepare a Procurement Document

### Lesson 9: Executing Project Work
- Identify the Direct and Manage Project Execution Process
- Execute a Quality Assurance Plan
- Acquire the Project Team
- Develop the Project Team
- Manage the Project Team
- Distribute Project Information
- Manage Stakeholder Relationships and Expectations

### Lesson 10: Managing Project Procurement
- Examine the Conduct Procurements Process
- Obtain Responses from Sellers
- Determine Project Sellers

### Lesson 11: Monitoring and Controlling Project Work
- Identify the Monitor and Control Project Work Process
- Develop an Integrated Change Control System
- Utilize the Integrated Change Control System
- Review Deliverables and Work Results
- Control the Project Scope

### Lesson 12: Monitoring and Controlling Project Schedule and Costs
- Control the Project Schedule
- Control Project Costs

### Lesson 13: Monitoring and Controlling Project Performance and Quality
- Perform Quality Control
- Report on Project Performance

### Lesson 14: Monitoring and Controlling Project Risks and Procurements
- Monitor and Control Project Risks
- Administer Project Procurements

### Lesson 15: Closing the Project
- Close Project Procurements
- Close the Project or Phase Administratively
Java 6 Programming Fundamentals for OO Developers (C++, etc.) is a five-day, comprehensive hands-on workshop geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 6, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development.

At Course Completion

Students who attend Java 6 Programming Fundamentals for OO Developers will leave this course armed with the required skills to develop solid object-oriented applications written in Java, using sound coding techniques and best coding practices. Geared for developers with prior OO development experience in languages such as C++ or SmallTalk, this course will teach students everything they need to become productive in essential Java programming.

Working within a dynamic, hands-on learning environment, guided by our expert team, attendees will learn to:

- Understand not only the fundamentals of the Java language, but also its importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Learn to use Java multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java 6 features and capabilities
- Work with the logging API and framework that is part of the Java platform
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Understand and work with the classes in the concurrent package
- Outline the options for GUI applications in Java
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Throughout the five-day course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review.

Prerequisites

Working knowledge of object-oriented programming languages such as C++.

Course Outline

Java: A First Look

Lesson - Using the JDK
- Setting Up Environment
- The Development Process
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Applications and Applets

Lesson - Writing a Simple Class
- Classes in Java™
- What Is a Class?
- Defining the Class
- Class Modifiers
- Class Instance Fields
- Instance Fields Diagram
- Primitives vs. Object References
Lesson - The Java™ Platform
- Defining Java
- Java Provides Several Platforms
- Note on Terminology
- Java SE 6
- Java SE Development Kit (JDK)
- Executing Programs
- Lifecycle of a Java Program
- Responsibilities of JVM
- Java is Dynamic: The Runtime Process
- Primary Areas of the JVM Runtime
- Garbage Collection
- Documentation and Code Reuse
- JavaDoc Provides Documentation Delivery
- In-Line Comments are Translated into HTML Rendering
- Working with Java in Your Environment

Session
Object-Oriented Concepts In Java

Lesson - Object-Oriented Programming
- The Object Oriented Way
- Real-World Objects
- Classes and Objects
- Examples of Classes and Objects
- Classes and Objects Diagram
- Object Behavior
- Methods and Messages

Lesson - Inheritance, Abstraction, and Polymorphism
- Encapsulation
- Inheritance
- Method Overriding
- Aggregation
- Type Abstraction - Grouping as Supertype
- Polymorphism
- Polymorphism Diagram

Session
Getting Started with Java™

Lesson - Adding Methods to the Class
- Instance Methods
- Passing Parameters Into Methods
- Returning a Value From a Method
- Overloaded Methods

Lesson - Overloaded Methods Diagram
- Constructors
- Defining a Constructor
- Optimizing Constructor Usage

Lesson - Language Statements
- Operators
- Comparison and Logical Operators
- Looping: The for Statement
- Looping: The while Statement
- Looping: The do Statement
- Continue and Break Statements
- The switch Statement

Lesson - Using Strings
- Strings
- String Method
- String Equality
- StringBuffer
- Strings, StringBuffer, and StringBuilder
- StringTokenizer
- Scanner
- Scanner - File Source
- Scanner - Getting Input
- Scanner - Testing for Tokens
- Scanner - Patterns for Tokens
- Formatter
- Formatter - Probable First Encounters
- Formatter - StringBuffer

Lesson - Specializing in a Subclass
- Extending a Class
- The extends Keyword
- Casting
- Overriding Superclass Methods
- Method Overriding Diagram
- Calling Superclass Methods from Subclass
- The Object Class
- The equals Method
- Default Constructor
- Implicit Constructor Chaining
- Passing Data Up Constructor Chain
- A Common Programming Mistake
- Editing Tools in Your IDE

Session
Essential Java™ Programming

Lesson - Fields and Variables
- Fields vs. Variables
- Data Types
Lesson - Using Arrays
- Arrays
- Accessing the Array
- Multidimensional Arrays

Lesson - Static Methods and Fields
- Static Fields
- Simple Example of Static Fields
- Static Methods
- Lesson - Java™ Packages
- The Problem
- Packages
- Class Location of Packages
- The Package Keyword
- Importing Classes
- Executing Programs
- Visibility
- Java Naming Conventions
- Packages Diagram
- Refactoring in Your IDE

Session
Advanced Java™ Programming

Lesson - Inheritance and Polymorphism
- Polymorphism
- Polymorphism: The Subclasses
- Treating Derived Classes as the Superclass
- Casting to the Derived Class
- Using instanceof For Downcasting
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

Lesson - Interfaces and Abstract Classes
- Separating Capability from Implementation
- Abstract Classes
- Shape as an Abstract Class
- Polymorphism With Abstract Classes
- Interfaces
- Implementing an Interface
- Extending Interfaces
- Polymorphism With Interfaces
- Type Checking
- Abstract Classes vs. Interfaces

Lesson - Exceptions
- What is an Exception?
- Exception Architecture
- Handling Exceptions
- The Throwable Class
- The try Block
- The catch Block
- The finally Block
- Full Example of Exception Handling
- Generalized vs. Specialized Exceptions
- Overriding Methods
- Creating Your Own Exceptions
- Throwing Exceptions
- Re-throwing an Exception
- Checked vs. Unchecked Exceptions
- Debugging in Your IDE

Session
Java™ Developer’s Toolbox

Lesson - Utility Classes
- Wrapper Classes
- The Number Class
- Numbers and Strings
- Big Decimal
- Random Numbers
- Decimal Formatting
- The Date Class

Lesson - Vector and Hashtable
- The Vector Class
- Creating and Using a Vector
- Java Collections Methods in Vector
- Hashtables
- Understanding How Hashing Works
- Creating and Using a Hashtable
- Performing Lookups

Lesson - Collections
- The Collections Framework
- Collections Feature Types
- Collections Interface Hierarchy
- Map Interfaces
- Optional Methods
- The Collection Interface
- Iterators
- The Set Interface
- SortedSet
- Set and SortedSet Example
Lesson - Generics
- Generics and Parametric Polymorphism
- Simple Generics
- The Mechanics of Generics
- Generics and Subtyping
- Compiler Restrictions on Generics and Subtyping
- Generics as Arguments in Methods
- Rationale Behind Wildcards
- Wildcards In Use
- Regular Wildcards in Method Parameters
- Bounded Wildcards
- Standard Rules Apply
- Generic Methods
- Interoperability with Legacy Code
- Raw Types
- Legacy Calls To Generics
- When Generics Should Be Used
- Build Paths in Your IDE

Lesson - Overview of Java GUIs
- JFC - Java Foundation Classes
- Categories of Classes in JFC
- Creating the Frame
- Adding Content to a Frame
- A Closer Look at Layout Managers
- BorderLayout
- JFC Provides an Event Handling Structure

Lesson - Autoboxing, Enhanced for Loop and Varargs
- Autoboxing/Unboxing
- Autoboxing/Unboxing Issues
- For() Loops and Collections
- The Enhanced for() Loop
- Another Example - Problematic
- Another Example - Enhanced for()
- Enhanced for() Loop Restrictions
- Previous Variable Argument Support
- Variable Arguments in Java SE 1.5
- Varargs rules
- Issues

Lesson - Enumerations and Static Imports
- Rationale for Enumerations
- Enumeration Syntax
- Enumerations Methods
- Enumerations as a Better Class Type
- Enumeration Code
- EnumSet
- EnumMap
- When You Should Use Enumerations
- Using Static Imports
- When You Should Use Static Imports

Lesson - Inner Classes
- Defining Inner Classes
- Member Inner Classes
- Local Inner Classes
- Anonymous Inner Classes
- Anonymous Subclassing

Lesson - Multithreading
- Principles of Multithreading
- Creating a Threaded Class
- Creating a Threaded Class Using Runnable
- Example: Threaded Class
- Example: Runnable Class
- Basic Features of the Thread Class
- Daemon Threads
- Thread Scheduling
- Signaling a Thread
- Sleeping
- Thread Synchronization
- Synchronized Methods
- Synchronized Block
- Object Synchronization

Lesson - Java I/O
- The Java I/O Mechanism
- Byte Level I/O
- Subclasses Accessing Real Data
- Filter Classes
TT2100-6: Java 6 Programming Fundamentals for OO Developers (C++, etc)

<table>
<thead>
<tr>
<th>COURSE OUTLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Reading Stream as Data Primitives</td>
</tr>
<tr>
<td>● Adding Buffering for Better Performance</td>
</tr>
<tr>
<td>● Writing Buffered Data to a File</td>
</tr>
<tr>
<td>● Character Level I/O</td>
</tr>
<tr>
<td>● Subclasses Accessing Real Data</td>
</tr>
<tr>
<td>● Reader/Writer Filter Classes</td>
</tr>
<tr>
<td>● Serialization</td>
</tr>
<tr>
<td>● Switching Java Versions in Your IDE</td>
</tr>
</tbody>
</table>

**Lesson - Introduction to Annotations**

- Annotations Overview
- Working with Java Annotations
- Example of Using @Override
- Annotations are Heavily Used in Many Technologies
- Declaring Persistence in Hibernate

**Session**

**Java™ Application Development**

**Lesson - File System Access**

- The File Class
- File Utility Methods
- RandomAccessFile
- Byte-Based File Access
- Text-Based File Access
- FileReader Diagram

**Lesson - Networking**

- Socket Programming Fundamentals
- Communicating on a Socket
- Single-Threaded Server Performance
- Creating a Threaded Server
- Sending and Receiving Objects
- Useful Methods

**Lesson - JDBC ™**

- What is JDBC?
- Structured Query Language (SQL)
- Connecting to the Database
- Statements
- Statement and PreparedStatement
- ResultSet
- JDBC Diagram
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency

- Mapping SQL Types to Java Types
- Database Connection Via JDBC Calls
- Rationale for Connection Pooling
- Connection Pooling in JDBC
- Database Connection Using a DataSource
- Stored Procedures Defined
- Callable Statement Syntax
- Stored Procedure Parameters
- RowSet Implementations
- JDBCRowSet
- JDBCRowSet Approach
- JDBCRowSet - Retrieving Data
- @JDBCRowSet Example
- CachedRowSet
- CachedRowSet Approach
- CachedRowSet Example

**Lesson - Java Logging**

- Why Logging?
- Logging Framework
- Logging in Java
- Java Logging Framework
- The Logger Class
- Global Configuration
- Logging Levels
- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

**Lesson - New In Java 6**

- Java 6 - Performance
- Java 6 - Security Improvements
- Java 6 - Web Services Improvements
- Java 6 - Development
- Java 6 - GUI
- Java 6 - Compression
- Java 6 - Collection Interfaces
- Java 6 - Concrete Implementation
- Java 6 - Retrofitted
- Java 6 - More on Collection
- Java 6 - I/O
- Java 6 - Internationalization
- The JAXB Difference

ATG Learning
P: 404.252.9611 F: 404.252.8118 www.atglearning.com
Developing JEE (Java EE) Applications using Servlets/JSPs, JDBC and More
Course#: TT5100

About this Course
This is a five-day in-depth course geared for software developers who need to understand what J2EE is, what it means in terms of today's systems and architectures, and how to apply basic Servlets and JSPs in implementing and deploying robust, flexible web applications.

Java 2, Enterprise Edition (J2EE) is a powerful platform for building web applications. The J2EE platform offers all the advantages of developing in Java plus a comprehensive suite of server-side technologies. This course tells you what you need to know to design and build your own web applications. You'll learn the details of the key J2EE technologies and how to leverage the strengths of each, with special focus on Servlets and JSPs. At the same time, you'll be learning about the big picture of J2EE and how to design web applications that are robust, efficient, secure, and maintainable. If you want to deliver an application on the web, you'll find this course essential.

At Course Completion
Students who attend Building J2EE Web Applications using Servlets/JSPs & JDBC will leave the course armed with the required skills to build basic web applications.

- Design and build robust, secure, and maintainable web applications
- Access databases with JDBC
- Create dynamic HTML content with Servlets and Java Server Pages
- Make Servlets and JSP work together cleanly
- Use JSP 2.0, EL, and JSTL to separate Java and HTML code

Prerequisites
Working knowledge of object-oriented programming languages such as C++.

Course Outline

Session: J2EE Application Architecture
Technical Overview of J2EE
- What is J2EE?
- Common Themes In J2EE Framework
- J2EE Containers and Components
- Servlets
- Java Server Pages (JSP)
- EJBs and Web Services
- J2EE Containers
- J2EE Application Modules
- The J2EE 1.4 Specification
- J2EE Platform Roles

J2EE Application Architectures (web based)
- J2EE and the Web
- J2EE 1st Generation DB-centric Web Application
- Adding JSPs to Separate Presentation

- Eliminating Java code from view
- The Model 2 Architecture
- Using EJBs
- J2EE Infrastructure Supporting Web Applications
Lesson Review

Session: Web Applications
Understanding Web Applications
- J2EE Application Modules
- The Truth about Archives
- Enterprise Application Archive (EAR)
- Enterprise JavaBean Archive (JAR)
- J2EE Application Client (JAR)
- Resource Adapter Archive (RAR)
- Web Application Archive (WAR)
- Directory Structure

Configuring Web Applications
- Mapping an HTTP Request to a Resource
TT5100: Developing JEE (Java EE) Applications using Servlets/JSPs, JDBC and More

COURSE OUTLINE

- The web.xml File
- Structure
- Declaring Servlets and JSPs
- Servlet Mapping
- Servlet Init Parameters
- Web Application init Parameters
- Welcome Page
- Error Page

Session: Developing Servlets

Introduction to Servlets
- Servlet Overview
- Life Cycle of Servlets
- Servlet Lifecycle is Handled by Web Container
- HttpServlet
- Writing the init Method
- HttpServlet doPost XXX Methods
- Writing a Simple HTTP Servlet
- HttpServletRequest Methods
- ServletResponse
- HttpServletResponse
- Servlet I/O Classes
- Return a Status Code
- Building the Output Document
- Sending Binary Content

Processing Input Data
- Form Processing with Servlets
- HTML Form
- LoginServlet doPost

Server-Side Control
- Request Dispatcher
- Forward the processing
- Passing Processing on and Getting it Back
- Servlet Runs Within Web Container Environment
- Several Options for Receiving Data
- Init Parameters and Attributes
- ServletConfig; ServletContext
- Servlet Variables are Scoped
- HTTP Request Information
- Several Options for Sharing Data
- Configuration and Context
- Servlet Variables
- HttpServlet Request
- Threading and Data
- Threading and Data 2

Client Side Control
- Output Buffering

- Setting Status Codes; Setting Headers
- sendRedirect
- Disabling Client Caching
- Supporting Persistent Connections
- Setting Content Length
- Dynamic Content Pushing

Maintaining Client State (Sessions)
- Session Management
- Tracking Problem – Stateless HTTP
- Data Problem – Session Data
- Solving the Tracking Problem
- Cookies
- Cookie Behavior; Retrieving Cookies
- servlet to set Cookies
- Servlet to Show Cookies
- URL Rewriting
- Solving the Data Problem
- iWeb Container Manages Session Instances
- Sessions with Cookies
- Cookie-Based Sessions
- Basic Session Implementation
- Cookie Detection is not Standardized
- Getting Rid of Http Sessions
- Session with URL Rewriting

Application and Session Events
- Event Listener Model
- Life Cycle Events in a Web-Application
- Declare the Listener
- Type of Events
- Context Listeners; Session Listeners
- Session Listeners for Session-Objects

Session Filters

Overview of Filters
- What is a Filter
- Single Filter
- Filter Objects
- init Method
- doFilter Method
- Filter Life Cycle
- Cascading Filters

Filtering Requests and Responses
- Request Wrapper
- Process the Request
- Examples of Request Filters
- Filter the Response
- Response Wrapper
Session: Developing JavaServer Pages

Introduction to JavaServer Pages
- Separating Presentation from Model
- Java Server Page (JSP): An Extension of Servlet
- Lifecycle of a JSP
- Example JSP
- JSP Syntax Consists of Three Types
- JSP Scripting: Declarations, Expressions; Scriptlets & Directives
- The session Attribute
- The errorPage/isErrorPage Attribute
- JSP Actions
- JSP Actions: Include/Forward
- Typical JSP Access Model
- JSP Action: useBean
- Implicit Objects
- JSP or Servlets

JSP Implicit Objects
- Implicit Objects
- Page Object; Config Object
- Request Object; Response Object
- Out Object
- Output Buffer
- Session Object
- Application Object
- PageContext Object
- Attributes
- Session Attributes
- Exception Handling

Actions, Java Beans, and Custom Tags
- Standard Actions
- Forwarding; Including
- Using JavaBeans and JSP
- Declaring to use a Bean
- Using a Bean, Example
- Setting and Getting Properties
- What are Custom Tags?
- Create and Use a Custom TagLib

Session: JSP 2.0
- Introduction to JSP
- JSP 2.0 Specification
- The web.xml in J2EE 1.4
- <jsp-config>
- JSP Format Rules
- JSP Error Pages

The Expression Language
- The Expression Language
- The Expression Language (JSP 2.0)
- Enable/Disable EL
- Variables
- Literals and Operators in the JSP EL
- Implicit Objects in JSP EL
- Reserved Words
- EL Functions
- Developing the Function
- Declaring the Function in the TLD
- Using the Function
- Pre-Built EL Functions

Session: JSTL 1.1

JSTL Introduction and Core Library
- Introduction to JSTL
- Expression Language (EL) in JSTL
- Review of JSP Bean Tags
- Tag Collaboration
- JSTL Core
- <c:choose>, <c:when>, <c:otherwise>
- <c:if>, <c:import>, <c:forEach>, <c:forTokens>, <c:out>
- <c:param>, <c:catch>, <c:redirect>, <c:remove>, <c:set>
- Using c:set to pass HTML
- <c:url>

JSTL Format Library
- JSTL Format
- <fmt:requestEncoding>, <fmt:setLocale>, <fmt:timezone>
- <fmt:setTimeZone>, <fmt:bundle>, <fmt:setBundle>, <fmt:message>
- <fmt:formatNumber>, <fmt:parseNumber>
- <fmt:formatDate>, <fmt:parseDate>

JSTL SQL Library
- JSTL SQL
- <sql:query>, <sql:update>, <sql:transaction>, <sql:param>, <sql:dateParam>

JSTL XML
- JSTL XML
- <x:choose>, <x:when>, <x:otherwise>
- <x:out>, <x:import>, <x:forEach>, <x:forTokens>, <x:parse>, <x:set>
- <x:transform>, <x:param>
- Simple Tag Handlers
- Tag Files
Simple Tag Handlers

- Tag File Location
- Tag Files Outside of a Library
- Tag Library Descriptors
- The TLD File
- The <tag-file> Element
- Tag File with Attributes
  - jsp:attributeElement
- Using Attributes
  - jsp:doBody
  - jsp:invoke

Session: Database Integration: JDBC and J2EE

JDBC and Its Position in J2EE

- JDBC Versions
- The JDBC API
- JDBC in J2EE
- Programming with DataSources
- JNDI names
- DataSource Programming Best Practices

JDBC Data Access API

- Structured Query Language (SQL)
- Statements & Statement
- PreparedStatement
- ResultSet
- Executing Inserts, Updates, and Deletes
- Mapping SQL Types to Java Types
- CallableStatement

The DAO Pattern

- Data Access Object (DAO)
- DAO Structure
- DAO Example: ProductDAO
- The DAOFactory
- Complete UML Diagram
- Using the ProductDAO

Session: Additional J2EE Components

Working With Enterprise JavaBeans

- Defining Enterprise JavaBeans
- JavaBeans vs EJBs
- EJB Architecture Overview
- EJB Container & Types of EJBs
- Enterprise Bean; Session Beans
- Entity Beans
- Message-Driven Bean
- EJBObject/EJBLocalObject

Web Services in J2EE – WSEE

- What are Web Services?
- Web Services Architecturally
- XML and Web Service APIs
- Web Services for J2EE - WSEE
- Servlets as Web Services
- EJBs as Web Services
- Routing SOAP requests to an EJB
- WSDD

Session: Security

J2EE Security

- Typical J2EE App Server Security Services
- Java 2 Platform Security Model
- Java 2 Security in J2EE
- JAAS Authentication: Who are you?
- J2EE Security Overview
- Authorization: Are you allowed access?
- High-Level Trace of J2EE Authorization
- Deployment Descriptors Play a Large Role
- Declaring Secure Resources
- Declaring the security roles
- Typical J2EE App Server Security Services
- Security on the Web; Secure Web Traffic
- SSL In Action
- Responsibilities For Security
- CMS: Defining HTTPS
- Authentication Challenge Mechanisms

Web Application Security Overview

- Attacks are Constant and Changing
- Open Web Application Security Project
- Assets are the Targets
- The Context for Defensive Coding
- Attackers Not Hackers
- Cross-Site Scripting (XSS): Description
- Defending Against XSS Attacks
- SQL Injection: Description; Example & Drill Down
- Defending Against SQL Injection Attacks

Handling Untrusted Input

- Unvalidated Input: Description
- Protecting a Web Resource
- Defending a Web Application
- Defending a Web Application/Resource
- Responding to Error State
### Session: Additional J2EE Topics

#### Transactions
- Transaction Definitions
- The ACID Transaction Properties
- Transaction Lifecycle
- Overview of a Transactional System
- J2EE Transaction Support

#### Other J2EE APIs
- Java Message Service (JMS)
- When is Messaging Used?

#### Course Outline
- Best Practices for Untrusted Data
- Additional Types of Attacks
- Two Messaging Models
- More On Publish/Subscribe
- Logical View of Publish/Subscribe
- More On Point-to-Point (P2P)
- Logical View of Point-To-Point
- Message Servers
- JavaMail; JavaMail Architecture
- XML
- An XML Document
- J2EE and XML

#### The J2EE Blueprints
- Overview
- Key Resources
About this Course

Students will learn the basic skills necessary to understand the structure of the UNIX operating system and to use the available utilities and commands to manage file structures in AIX UNIX. Students will also learn more advanced skills to understand the AIX UNIX environment and features.

At Course Completion

After completing this course, students will be able to:

* Understand the basic feature available in UNIX, and briefly understand its history and evolution.
* Log in and log out, change their password, and understand some basic UNIX commands and the UNIX command syntax: `command - option argument`.
* Use the mail utility and the talk utility.
* Understand full paths, partial paths, current working directory, and the concept of home directory.
* Create directories, copy and move files, and remove files and directories.
* Secure files and directories by the use of permissions.
* Combine several UNIX utilities to create new utilities that accomplish specific tasks.
* Create and edit a vi file.
* Create "custom" commands that can be run from the prompt.
* Explore the different UNIX shells available, such as the Bourne, C, and Korn Shells.
* Work with a user-defined interface, and modify existing files and create files that customize their user interface.
* Use the alias command, assign an alternate name to a command, and create user-defined commands.
* Understand the components that comprise the C-Shell history feature, and perform a complete installation of the history program by modifying and adding the necessary commands and assignments.
* Determine their user and terminal status, use commands to determine who else is on a system and some of their system attributes, and determine the location of commands that are available to users.
* Use multi-tasking to manage processes.
* Use the find command to search for files and directories that meet a criterion defined by them.
* Use file compression and restoration, the tar command, and the pr and lpr commands.
* Use the tr, sed, and awk commands to modify and manage file contents, to create files, or to output stream.
Module 1: Getting Started with Unix
- Accessing a Unix System
- Connecting to the Unix System
- Logging In
- Changing Your Password with passwd
- Listing Directories and Files with ls
- Changing Directories with cd
- Finding Yourself with pwd
- Piping Input and Output
- Redirecting Output
- Using wildcards
- Viewing File Contents with more
- Viewing File Contents with cat
- Exploring the System
- Getting Help with man
- Logging Out

Module 2: Using Directories and Files
- Creating Directories with mkdir
- Creating Files with touch
- Copying Directories and Files with cp
- Listing Directories and Files with ls
- Moving Files with mv
- Removing Files with rm
- Removing Directories with rmdir
- Finding Forgotten Files with find
- Locating Lost Files with locate
- Linking with ln (Hard Links)
- Linking with ln-s (Soft Links)

Module 3: Working with Your Shell
- Discovering Which Shell You’re Using
- Understanding Shells and Options
- Changing Your Shell with chsh
- Changing Your Shell Temporarily
- Using Completion in the bash Shell
- Viewing Session History in zsh Shell
- Changing Your Identity with su
- Fixing Terminal Settings with stty
- Exiting the Shell

Module 4: Creating and Editing Files
- Choosing an Editor
- Starting pico and Dabbling with It
- Saving in pico
- Cutting and Pasting Text Blocks in pico
- Check spelling in pico
- Getting Help in pico
- Exiting pico
- Starting vi and Dabbling with It
- Saving in vi
- Adding and Deleting Text in vi
- Importing Files into vi
- Searching and Replacing in vi
- Exiting vi
- Starting emacs and Dabbling with It
- Using emacs Menus to Spell Check
- Saving in emacs
- Exiting emacs

Module 5: Controlling Ownership and Permissions
- Understanding File Ownership and Permissions
- Finding Out Who owns What
- Finding Out Which Group You’re In
- Changing Ownership of Files and Directories with chown
- Directories with chown
- Changing Permissions with chmod
- Translating Mnemonic Permissions to numeric Permissions

Module 6: Manipulating Files
- Counting Files and Their Contents with wc
- Viewing File Beginnings with head
- Viewing File Endings with tail
- Finding Text with grep
- Using regular Expressions with grep
- Using Other Examples of Regular Expressions
- Making Global Changes with sed
- Regular Expressions
- Making Global Changes with sed
- Changing Files with awk
- Comparing Files with cmp
- Finding Differences in Files with diff
- Finding Differences in Files with sdiff
- Sorting Files with sort
- Eliminating duplicates with uniq
- Redirecting to Multiple Locations with tee
- Changing with tr
- Formatting with fmt
- Splitting Files with split

Module 7: Getting Information About the System
- Getting System Information with u name
- Viewing File Systems with df
- Determining Disk Usage with du
- Finding Out File Types with file
- Finding Out About Users with finger
- Learning Who Else Is Logged in with Who
- Learning Who Else is Logged in with W
- Getting Information About Your Userid with id
Module 8: Configuring Your Unix Environment
- Understanding Your Unix Environment
- Discovering Your Current Environment
- Adding or Changing Variables
- Looking at Your zsh Configuration Files
- Adding to Your bash Path
- Changing Your bash Prompt
- Setting Aliases with alias

Module 9: Running scripts and Programs
- Running a Command
- Scheduling Onetime Jobs with at
- Scheduling Regularly Occurring Jobs with cron
- Suspending Jobs
- Checking Job Status with jobs
- Running Jobs in the Background with bg
- Running Jobs in the Foreground with fg
- Controlling Job Priority with nice
- Timing Jobs with time
- Finding Out What Processes Are Running with ps
- Deleting Processes with Kill

Module 10: Writing Basic Scripts
- Creating a Shell Script
- Running a Shell Script
- Making a Script Executable
- Getting a Head Start on Scripts with history
- Embedding Commands
- Looping Your Scripts
- Creating If-Then Statements
- Accepting Command-Line Arguments in Your Scripts
- Accepting Input While a Script Is Running
- Debugging Scripts

Module 11: Sending and Reading E-mail
- Choosing an E-mail Program and Getting Started
- Reading E-mail with pine
- Sending E-mail with pine
- Customizing pine
- Reading E-mail with mutt
- Sending E-mail with mutt
- Reading E-mail with mail
- Sending E-mail with mail
- Creating a Signature File
- Automatically Forwarding Incoming Messages
- Announcing an Absence with vacation
- Configuring procmail
- Managing E-mail with procmail

Module 12: Accessing the Internet
- Getting Familiar with Unix Internet Lingo
- Logging in to Remote Systems with ssh
- Logging in to Remote Systems with telnet
- Communicating with Others using write
- Communicating with Others using talk
- Getting Files from the Internet with ftp
- Sharing Files on the Internet with ftp
- Surfing the Web with links
- Surfing the Web with lynx
- Downloading Web Sites with wget
- Checking Connections with ping
- Tracing Connections with traceroute
- Matching Domain Names with IP Addresses

Module 13: Working with Encoded and Compressed Files
- Encoding Files with uuencode
- Decoding Files with uudecode
- Archiving with tar
- Unarchiving Files with tar
- Compressing Files with compress
- Uncompressing Files with uncompress
- Zipping a File or Directory with gzip
- Unzipping a gzip File with gunzip
- Zipping Files and Directories with zip
- Unzipping Zipped Files with unzip
- Combining Commands

Module 14: Using Handy Utilities
- Calendaring with cal
- Calculating with bc
- Evaluating Expressions with expr
- Converting with units
- Looking It Up with look
- Keeping a Record of Your Session with script

Module 15: Being Root
- Acting Like root with sudo
- Becoming root with su
- Starting, Stopping, and Restarting Daemons
- Changing the System Configuration
- Monitoring the System
- Keeping up with watch
- Checking Boot Messages with dmesg
- Setting the Date and Time

Module 16: Sensational Unix Tricks
- Cleaning Up HTML Documents with tidy
- Searching and Replacing Throughout Multiple Documents with sed
- Generating Reports with awk
- Using Input to Customize Your Environment
- Using ROT13 Encoding with sed
- Embedding ROT13 Encoding in a Shell Script

- Making Backups with rsync
- Using Advanced Redirection with stderr
Cisco Certified Network Associate Wireless (CCNA Wireless) recognizes the critical importance of professionals supporting wireless LANS including Networking Associates/Administrators, Wireless Support Specialists and WLAN project managers. CCNA Wireless validates associate-level knowledge and skills to configure, implement and support of wireless LANs, specifically those networks using Cisco equipment. With a CCNA Wireless certification, network professionals can support a basic wireless network on a Cisco WLAN in a SMB to enterprise network. The CCNA Wireless curriculum includes information and practice activities to prepare them for configuring, monitoring and troubleshooting basic tasks of a Cisco WLAN in SMB and Enterprise networks.

### Prerequisites

- Valid Cisco CCNA or any Cisco CCIE certification can act as a prerequisite.

### At The Course Completion

#### Describe WLAN fundamentals

- Describe basics of spread spectrum technology
- Describe the impact of various wireless technologies (Bluetooth, WiMAX, ZigBee, and cordless phone)
- Describe wireless regulatory bodies, standards and certifications (FCC, ETSI, 802.11a/b/g/n, and WiFi Alliance)
- Describe Wireless LAN (WLAN) RF principles (antenna types, RF gain/loss, Effective Isotropic Radiated Power (EIRP), refraction, reflection, and so on)
- Describe networking technologies used in wireless (SSID to WLAN_ID to Interface to VLAN, 802.1q trunking)
- Describe wireless topologies, such as Independent Basic Service Set (IBSS), Basic Service Set (BSS), Extended Service Set (ESS), Point-to-Point, Point-to-Multipoint, Mesh, and bridging)
- Describe 802.11 authentication and encryption methods (Open, Shared, 802.1X, EAP, TKIP, and AES)
- Describe frame types (associated and unassociated, management, control, and data)
COURSE OUTLINE

- Describe basic RF deployment considerations related to site survey design of data or VoWLAN applications, common RF interference sources such as devices, building material, AP location, and basic RF site survey design related to channel reuse, signal strength, and cell overlap

**Install a basic Cisco wireless LAN**
- Identify the components of the Cisco Unified Wireless Network architecture (Split MAC, LWAPP, stand-alone AP vs controller-based AP, specific hardware examples)
- Install and configure autonomous access points in the small business environment
- Describe the modes of controller-based AP deployment (local, monitor, HREAP, sniffer, rogue detector, bridge, OEAP, and SE-Connect)
- Describe controller-based AP discovery and association (DHCP, DNS, Master-Controller, Primary-Secondary-Tertiary, and n+1 redundancy)
- Describe roaming (Layer 2 and Layer 3, intra-controller and inter-controller, and mobility list)
- Configure a WLAN controller and access points WLC: ports, interfaces, WLANs, NTP, CLI and Web UI, CLI wizard, and link aggregation group (LAG) AP: Channel and Power
- Describe Radio Resource Management (RRM) fundamentals including ED-RRM.
- Verify basic wireless network operation

**Install Wireless Clients**
- Describe client WLAN configuration requirements, such as Service Set Identifier (SSID), security selection, and authentication
- Identify basic configuration of common wireless supplicants (Macintosh, Intel Wireless Pro, Windows, iOS, and Android)
- Describe basic AnyConnect 3.0 or above wireless configuration parameters
- Identify capabilities available in CCX versions 1 through 5

**Implement basic WLAN Security**
- Describe the general framework of wireless security and security components (authentication, encryption, MFP, IPS)
- Describe and configure authentication methods (Guest, PSK, 802.1X, WPA/WPA2 with EAP-TLS, EAP-FAST, PEAP, LEAP)
- Describe and configure encryption methods (WPA/WPA2 with TKIP, AES)
- Describe and configure the different sources of authentication (PSK, EAP-local or-external, Radius)

**Operate basic WCS**
- Identify key functions of Cisco Wireless Control System (WCS) and Navigator (versions and licensing)
- Navigate WCS interface
- Configure controllers and access points (APs) (using the Configuration tab not templates)
- Use preconfigured maps in the WCS (adding/relocating/removing access points, turn on/off heat maps, view client location, and view CleanAir zones of influence)
- Use the WCS monitor tab and alarm summary to verify the WLAN operations
- Generate standard WCS reports (inventory, CleanAir, client-related, AP-related, and utilization)

**Conduct basic WLAN Maintenance and Troubleshooting**
- Identify and use basic WLAN troubleshooting tools (WLC show debug and logging) for client to AP connectivity, AP to controller connectivity
- Use the WCS client troubleshooting tool
- Transfer logs, configuration files, and O/S images to and from the WLC via the GUI
• Differentiate and use WLC and AP (autonomous and LAP) management access methods (console port, CLI, telnet, ssh, http, https, and wired vs wireless management)

Required Exams

The Implementing Cisco Unified Wireless Network Essential (IUWNE) exam is the exam associated with the CCNA Wireless certification (640-722 IUWNE).
CISCO CCNA Voice Boot Camp

About this Course

The Cisco Certified Network Associate Voice (CCNA Voice) validates associate-level knowledge and skills required to administer a voice network. The Cisco CCNA Voice certification confirms that the required skill set for specialized job roles in voice technologies such as voice technologies administrator, voice engineer, and voice manager. It validates skills in VoIP technologies such as IP PBX, IP telephony, handset, call control, and voicemail solutions.

The CCNA Voice certification assesses skills and knowledge related to the Cisco Unified Communications Manager. It is typically employed by large organizations such as governments, large companies, and colleges. Additionally, the CCNA Voice Certification assesses skills and knowledge related to the Cisco CallManager Express (CME) and Cisco Unity Express (CUE) solutions typically used by medium and small organizations such as companies with less than 2,000 employees, retail businesses, and small school districts.

Prerequisite

Cisco CCNA Routing and Switching or the following knowledge and skills:

- Working knowledge of converged voice and data networks
- Basic knowledge of Cisco IOS gateways
- Basic knowledge of Cisco Unified Communications Manager and Cisco Unity Connection

Required Exam

Introducing Cisco Voice and Unified Communications Administration (640-461 ICOMM)

Course Content

Introducing Cisco Voice and Unified Communications Administration (ICOMM) v8.1 teaches learners how to maintain and operate a Cisco Unified Communications solution that is based on Cisco Unified Communications Manager, Cisco Unified Communications Manager Express, Cisco Unity Connection, and Cisco Unified Presence. This course provides the learners with the knowledge and skills to achieve associate-level competency in Cisco Unified Communications.

Course Outline

Part I Voice Perspectives

Chapter 1 Traditional Voice Versus Unified Voice
“Do I Know This Already?”
Foundation Topics
Where It All Began: Analog Connections
The Evolution: Digital Connections
  Moving from Analog to Digital
  Channel Associated Signaling
  Common Channel Signaling
Understanding the PSTN
  Pieces of the PSTN
  Understanding PBX and Key Systems
  Connections to and Between the PSTN
  PSTN Numbering Plans
The New Yet Not-So-New Frontier: VoIP
  VoIP: Why It Is a Big Deal for Businesses
  The Process of Converting Voice to Packets
  Role of Digital Signal Processors
  Understanding RTP and RTCP
Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms

Chapter 2 Understanding the Pieces of Cisco Unified Communications
“Do I Know This Already?”
Foundation Topics
Did Someone Say Unified?
Understanding Cisco Unified Communications Manager Express
  CME Key Features
  CME Interaction with Cisco IP Phones
  A Match Made in Heaven: CME and CUE
Understanding Cisco Unified Communications Manager
  CUCM Key Features
  CUCM Database Replication and Interacting with Cisco IP Phones
Understanding Cisco Unity Connection
  Cisco Unity Connection Key Features
  Cisco Unity Connection and CUCM Interaction
Understanding Cisco Unified Presence
  Cisco Unified Personal Communicator
Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms

Chapter 3 Understanding the Cisco IP Phone Concepts and Registration
“Do I Know This Already?” Quiz
Foundation Topics
Connecting and Powering Cisco IP Phones
  Cisco Catalyst Switch PoE
  Powering the IP Phone Using a Power Patch Panel or Coupler
Powering the IP Phone with a Power Brick
VLAN Concepts and Configuration
  VLAN Review
  VLAN Trunking/Tagging
  Understanding Voice VLANs
  VLAN Configuration
Understanding the Cisco IP Phone Boot Process
Configuring a Router-Based DHCP Server
Setting the Clock of a Cisco Device with NTP
IP Phone Registration
Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms

Part II Managing Endpoints and End Users

Chapter 4 Getting Familiar with CME Administration
  “Do I Know This Already?”
  Foundation Topics
  Managing CME Using the Command Line
  Managing CME Using a Graphic User Interface
Exam Preparation Tasks
  Review All the Key Topics

Chapter 5 Managing Endpoints and End Users with CME
  “Do I Know This Already?”
  Foundation Topics
  Ensuring the Foundation
  Voice VLAN
  DHCP Services
  TFTP Services
  Base CME Configuration
Ephone and Ephone-DN—The Keys to Ringing Phones
  Understanding and Configuring Ephone-DNs
  Understanding and Configuring Ephones
  Associating Ephones and Ephone-DNs
Adding Directory Numbers, Phones, and Users with CCP
Exam Preparation Tasks
  Review All the Key Topics

Chapter 6 Understanding the CME Dial-Plan
  “Do I Know This Already?”
  Foundation Topics
  Configuring Physical Voice Port Characteristics
  Configuring Analog Voice Ports
  Foreign Exchange Station Ports
  Foreign Exchange Office Ports
Configuring Digital Voice Ports
Understanding and Configuring Dial Peers
  Voice Call Legs
  Configuring POTS Dial Peers
  Configuring VoIP Dial Peers
  Using Dial Peer Wildcards
  Private Line Automatic Ringdown
Understanding Router Call Processing and Digit Manipulation
  Matching Inbound and Outbound Dial Peers
  Using Digit Manipulation
  Practical Scenario 1: PSTN Failover Using the prefix Command
  Practical Scenario 2: Directing Operator Calls to the Receptionist
  Practical Scenario 3: Specific POTS Lines for Emergency Calls
  Practical Scenario 4: Using Translation Profiles
  Using CCP to Configure a CME Dial-Plan
Understanding and Implementing CME Class of Restriction
Quality of Service
  Understanding the Enemy
  Requirements for Voice, Video, and Data Traffic
  Network Requirements for Voice and Video
  Network Requirements for Data
  Using Cisco AutoQoS
Exam Preparation Tasks
  Review All the Key Topics
  Complete the Tables and Lists from Memory
  Definitions of Key Terms

Part III Handling Calls

Chapter 7 Configuring Cisco Unified CME Voice Productivity Features
  “Do I Know This Already?”
  Foundation Topics
  Configuring a Voice Network Directory
  Configuring Call Forwarding
    Forwarding Calls from the IP Phone
    Forwarding Calls from the CLI
    Using the call-forward pattern Command to Support H.450.3
  Configuring Call Transfer
  Configuring Call Park
  Configuring Call Pickup
  Configuring Intercom
  Configuring Paging
  Configuring After-Hours Call Blocking
  Configuring CDRs and Call Accounting
  Configuring Music on Hold
  Configuring Single Number Reach
  Enabling the Flash-Based CME GUI
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 8 Administrator and End-User Interfaces
“Do I Know This Already?”
Foundation Topics
Describe the CUCM GUI and CLI
Cisco Unified Communications Manager Administration Interface
Cisco Unified Serviceability Administration Interface
Cisco Unified Operating System Administration Interface
Disaster Recovery System Interface
Cisco Unified Reporting Interface
CLI
User Management in CUCM: Roles and Groups
Roles
Groups
Describe the CUC GUI and CLI
Cisco Unity Connection Administration
Cisco Unity Connection Serviceability
Describe the Cisco Unified Presence Server GUI and CLI
Cisco Unified Presence Administration Interface
Cisco Unified Presence Serviceability
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Part IV Telephony Feature Management

Chapter 9 Managing Endpoints and End Users in CUCM
“Do I Know This Already?”
Foundation Topics
Implementing IP Phones in CUCM
Special Functions and Services Used by IP Phones
NTP
CDP
DHCP
PoE
TFTP
DNS
IP Phone Registration Process
SIP Phone Registration Process
Preparing CUCM to Support Phones
Service Activation
DHCP Server Configuration
Configuring DHCP in Router IOS
IP Phone Configuration Requirements in CUCM
Device Pool
Device Defaults
Softkey Template and Phone Button Template
Profiles
Describe End Users in CUCM
End Users Versus Application Users
Credential Policy
Features Interacting with User Accounts
User Locale
Device Association
Implementing End Users in CUCM
Manual Entry
Bulk Import Using BAT
LDAP Integration
LDAP Synchronization
LDAP Authentication
LDAP Integration Considerations
LDAP Sync Agreements
LDAP Sync Mechanism
LDAP Custom Filters
Configure LDAP Sync
Activate DirSync
Configure the LDAP System
Configure the LDAP Directory
Verify LDAP Sync
Configuring LDAP Authentication
Verify LDAP Authentication
Create LDAP Custom Filters
Exam Preparation Tasks
Review All the Key Topics

Chapter 10 Understanding CUCM Dial-Plan Elements and Interactions
“Do I Know This Already?”
Foundation Topics
CUCM Call Flows
  Call Flow in CUCM if DNS Is Used
  Call Flow in CUCM if DNS Is Not Used
  Centralized Remote Branch Call Flow
  Centralized Deployment PSTN Backup Call Flow
  Centralized Deployment Considerations and Limitations
  PSTN Backup Using CAC
  Distributed Deployment Call Flow
  Call-Routing Sources in CUCM
  Call-Routing Destinations in CUCM
  Call-Routing Configuration Elements
  Route Pattern
  Route List
Route Group
Gateways and Trunks
Call-Routing Behavior
Digit Analysis
Hunt Groups
Class of Control
Partition
Calling Search Space
Interaction of Partitions and Calling Search Spaces
Line-Device Configuration
Exam Preparation Tasks
   Review All the Key Topics

Part V Voicemail and Presence Solutions

Chapter 11 Enabling Telephony Features with CUCM
“Do I Know This Already?”
Foundation Topics
Describe Extension Mobility in CUCM
Enable EM in CUCM
   Step 1: Activate the EM Service
   Step 2: Configure EM Service Parameters
   Step 3: Add the EM Service
   Step 4: Create Default Device Profiles
   Step 5a: Create Device Profiles
   Step 5b: Subscribe Device Profiles to the EM Service
   Step 6: Associate Users with Device Profiles
   Step 7a: Enable EM for Phones
   Step 7b: Subscribe Phones to EM Service
Describe Telephony Features in CUCM
   Call Coverage
   Call Forward
   Shared Lines
   Barge and Privacy
   Call Pickup
   Call Hunting
   Call Park
   Intercom
   CUCM Native Presence
   Presence Architecture
Enable Telephony Features in CUCM
   Enabling Call Coverage
   Configuring Shared Lines
   Configuring Barge
   Configuring Call Pickup
   Configuring Call Park and Directed Call Park
   Configuring Call Hunting
Configuring Intercom Features
Configure CUCM Native Presence
Configuring BLF Speed Dials
Configuring Presence-Enabled Call Lists
Configuring Custom Presence Groups

Exam Preparation Tasks
Review All the Key Topics

Chapter 12 Enabling Mobility Features in CUCM
“Do I Know This Already?”
Foundation Topics
Understanding CUCM Mobility Features
Describe Mobile Connect
Unified Mobility Architecture
Access Lists
Time-of-Day Access
Mobile Voice Access
Implementing Mobility Features in CUCM
Configuring Mobile Connect
Step 1: Configure Softkey Templates
Step 2: Configure User Accounts for Mobility
Step 3: Configure the IP Phone to Support Mobility Features
Step 4: Create Remote Destination Profiles
Step 5: Add Remote Destinations to Remote Destination Profiles
Step 6: Configure Ring Schedules for Each Remote Destination
Step 7: Configure Access Lists
Step 8: Apply Access Lists
Step 9: Configure Service Parameters
Configuring MVA
Step 1: Activate the MVA Service
Step 2: Configure Service Parameters
Step 3: Enable MVA for Each User
Step 4: Configure the MVA Media Resource
Step 5: Configure the MVA VXML Application at the IOS Gateway

Exam Preparation Tasks
Review All the Key Topics
Definition of Key Terms

Part VI Voice Network Management and Troubleshooting

Chapter 13 Voicemail Integration with Cisco Unity Connection
“Do I Know This Already?”
Foundation Topics
Describe Cisco Unity Connection
Overview of Cisco Unity Connection
Single-Site and Multisite Deployment Considerations
CUC Integration Overview
CUC Integration with CUCM Using SCCP
CUC Integration Using SIP
CUC Features
System Settings
Call Handlers
Call Routing
Direct Routing Rules
Forwarded Routing Rules
Call Routing Rule Filters
Distribution Lists
Authentication Rules
Dial-Plan

Describe Cisco Unity Connection Users and Mailboxes
   User Templates
   User Template Basics
   Password Settings
   Roles
   Transfer Rules and Greetings
   Call Actions
   Message Settings, Message Actions, and Caller Input
   TUI Settings
   CUC End Users
   Extension and Call Forward Options
   Voice Messaging with SRST and AAR
   Voicemail Box
   Private Distribution Lists
   Notification Devices
   User Creation Options
   CUC Voicemail Boxes
   Message Aging Policy and Mailbox Quotas

Implement Cisco Unity Connection Users and Mailboxes
   Configure End User Templates
   User Template Basics
   Password Settings
   Roles
   Message Settings
   Message Actions
   Phone Menu
   Playback Message Settings
   Notification Devices
   Configure CUC End Users
   Manual Process
   Alternate Extensions and Names
   Private DLs
   Importing End Users in to CUC
   Importing Users from CUCM
   Importing Users from LDAP
Bulk Administration Import of CUC Users
Managing the CUC Message Store
Mailbox Stores Membership
Message Aging Policy
Mailbox Quotas

Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 14 Enabling Cisco Unified Presence Support
“Do I Know This Already?”
Foundation Topics
Describe Cisco Unified Presence Features
Cisco Unified Personal Communicator
CUPC Operating Modes
Enterprise Instant Messaging
Voice Calls
Video Calls
Integration Support
CUPC System Requirements
Cisco Unified Client Services Framework
Cisco Unified Communications Manager IP Phone Service
Cisco IP Phone Messenger
Describe Cisco Unified Presence Architecture
Integration with Microsoft Office Communications Server
Integration with LDAP
Integration with Cisco Unity Connection
Integration with Conferencing Resources
Integration with Calendar Resources
Architecture and Call Flow: Softphone Mode
Architecture and Call Flow: Deskphone Control Mode
Compliance and Persistent Chat
CUPS and QoS Considerations
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 15 Common CME Management and Troubleshooting Issues
“Do I Know This Already?”
Foundation Topics
Troubleshooting
Troubleshooting Common CME Registration Issues
Troubleshooting Dial-Plan and QoS Issues
   Dial-Plan Issues
   QoS Issues
Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 16 Management and Troubleshooting of Cisco Unified Communications Manager
“Do I Know This Already?”

Foundation Topics
Describe How to Provide End-User Support for Connectivity and Voice Quality Issues
Troubleshooting
Troubleshooting IP Phone Registration Problems
Deleting Unassigned Directory Numbers Using the Route Plan Report
Describe CUCM Reports and How They Are Generated
Generating Reports
Analyzing Reports
Understanding CUCM CDR Analysis and Reporting Tool Reports
Activate CAR-Related Services
Configure CDR Service Parameters
CAR Tool Users
CDR and CMR Architecture
CAR System Parameters
Exporting CDR and CMR Records
Generating CDR Reports
Example Report Generation
Generating System Reports
Generating Device Reports
Describe Cisco Unified RTMT
RTMT Interface
Monitoring CUCM with RTMT
CallManager Summary
Gateway Activity
Device Search
Database Summary
Describe the Disaster Recovery System
Using the DRS
Set Up a Backup Device
Create a Scheduled Backup
Perform a Restore

Exam Preparation Tasks
Review All the Key Topics
Definitions of Key Terms

Chapter 17 Monitoring Cisco Unity Connection
“Do I Know This Already?”

Foundation Topics
Generating and Accessing Cisco Unity Connection Reports
Cisco Unity Connection Serviceability Reports
Cisco Unified Serviceability: Serviceability Reports Archive
Analyzing Cisco Unity Connection Reports
Troubleshooting and Maintenance Operations Using Cisco Unity Connection Reports
Reports to Support Routine Maintenance
Exam Preparation Tasks
  Review All the Key Topics
  Definitions of Key Terms
Chapter 18 Final Preparation
  Tools for Final Preparation
    Pearson Cert Practice Test Engine and Questions on the CD
    Install the Software from the CD
    Activate and Download the Practice Exam
    Activating Other Exams
    Premium Edition
    Cisco Learning Network
    Chapter-Ending Review Tools
    Suggested Plan for Final Review/Study
    Using the Exam Engine
Cisco Certified Network Associate Wireless (CCNA Wireless) recognizes the critical importance of professionals supporting wireless LANS including Networking Associates/Administrators, Wireless Support Specialists and WLAN project managers. CCNA Wireless validates associate-level knowledge and skills to configure, implement and support of wireless LANs, specifically those networks using Cisco equipment. With a CCNA Wireless certification, network professionals can support a basic wireless network on a Cisco WLAN in a SMB to enterprise network. The CCNA Wireless curriculum includes information and practice activities to prepare them for configuring, monitoring and troubleshooting basic tasks of a Cisco WLAN in SMB and Enterprise networks.

### Prerequisites

- Valid Cisco CCNA or any Cisco CCIE certification can act as a prerequisite.

### At The Course Completion

#### Describe WLAN fundamentals

- Describe basics of spread spectrum technology
- Describe the impact of various wireless technologies (Bluetooth, WiMAX, ZigBee, and cordless phone)
- Describe wireless regulatory bodies, standards and certifications (FCC, ETSI, 802.11a/b/g/n, and WiFi Alliance)
- Describe Wireless LAN (WLAN) RF principles (antenna types, RF gain/loss, Effective Isotropic Radiated Power (EIRP), refraction, reflection, and so on)
- Describe networking technologies used in wireless (SSID to WLAN_ID to Interface to VLAN, 802.1q trunking)
- Describe wireless topologies, such as Independent Basic Service Set (IBSS), Basic Service Set (BSS), Extended Service Set (ESS), Point-to-Point, Point-to-Multipoint, Mesh, and bridging)
- Describe 802.11 authentication and encryption methods (Open, Shared, 802.1X, EAP, TKIP, and AES)
- Describe frame types (associated and unassociated, management, control, and data)
COURSE OUTLINE

- Describe basic RF deployment considerations related to site survey design of data or VoWLAN applications, common RF interference sources such as devices, building material, AP location, and basic RF site survey design related to channel reuse, signal strength, and cell overlap

Install a basic Cisco wireless LAN
- Identify the components of the Cisco Unified Wireless Network architecture (Split MAC, LWAPP, stand-alone AP vs controller-based AP, specific hardware examples)
- Install and configure autonomous access points in the small business environment
- Describe the modes of controller-based AP deployment (local, monitor, HREAP, sniffer, rogue detector, bridge, OEAP, and SE-Connect)
- Describe controller-based AP discovery and association (DHCP, DNS, Master-Controller, Primary-Secondary-Tertiary, and n+1 redundancy)
- Describe roaming (Layer 2 and Layer 3, intra-controller and inter-controller, and mobility list)
- Configure a WLAN controller and access points WLC: ports, interfaces, WLANs, NTP, CLI and Web UI, CLI wizard, and link aggregation group (LAG) AP: Channel and Power
- Describe Radio Resource Management (RRM) fundamentals including ED-RRM.
- Verify basic wireless network operation

Install Wireless Clients
- Describe client WLAN configuration requirements, such as Service Set Identifier (SSID), security selection, and authentication
- Identify basic configuration of common wireless supplicants (Macintosh, Intel Wireless Pro, Windows, iOS, and Android)
- Describe basic AnyConnect 3.0 or above wireless configuration parameters
- Identify capabilities available in CCX versions 1 through 5

Implement basic WLAN Security
- Describe the general framework of wireless security and security components (authentication, encryption, MFP, IPS)
- Describe and configure authentication methods (Guest, PSK, 802.1X, WPA/WPA2 with EAP-TLS, EAP-FAST, PEAP, LEAP)
- Describe and configure encryption methods (WPA/WPA2 with TKIP, AES)
- Describe and configure the different sources of authentication (PSK, EAP-local or-external, Radius)

Operate basic WCS
- Identify key functions of Cisco Wireless Control System (WCS) and Navigator (versions and licensing)
- Navigate WCS interface
- Configure controllers and access points (APs) (using the Configuration tab not templates)
- Use preconfigured maps in the WCS (adding/relocating/removing access points, turn on/off heat maps, view client location, and view CleanAir zones of influence)
- Use the WCS monitor tab and alarm summary to verify the WLAN operations
- Generate standard WCS reports (inventory, CleanAir, client-related, AP-related, and utilization)

Conduct basic WLAN Maintenance and Troubleshooting
- Identify and use basic WLAN troubleshooting tools (WLC show debug and logging) for client to AP connectivity, AP to controller connectivity
- Use the WCS client troubleshooting tool
- Transfer logs, configuration files, and O/S images to and from the WLC via the GUI
• Differentiate and use WLC and AP (autonomous and LAP) management access methods (console port, CLI, telnet, ssh, http, https, and wired vs wireless management)

Required Exams

The Implementing Cisco Unified Wireless Network Essential (IUWNE) exam is the exam associated with the CCNA Wireless certification (640-722 IUWNE).
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

Cisco Certified Network Professional Security (CCNP Security) Boot Camp program is aligned specifically to the job role of the Cisco Network Security Engineer responsible for Security in Routers, Switches, Networking devices and appliances, as well as choosing, deploying, supporting and troubleshooting Firewalls, VPNS, and IDS/IPS solutions for their networking environments.

Prerequisite

CCNA Security certification

Course Content

CCNP Security Boot Camp is consisted of the following four courses:

Implementing Cisco Secure Access Solutions (SISAS)

Implementing Cisco Secure Access Solutions (SISAS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Identity Services Engine and 802.1X secure network access. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed network access security by utilizing Cisco ISE appliance product solution.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco Identity Services Engine architecture and access control capabilities.
- Understand 802.1X architecture, implementation and operation.
- Understand commonly implemented Extensible Authentication Protocols (EAP).
- Implement Public-Key Infrastructure with ISE.
- Understand the implement Internal and External authentication databases.
- Implement MAC Authentication Bypass.
- Implement identity based authorization policies.
- Understand Cisco TrustSec features.
- Implement Web Authentication and Guest Access.
- Implement ISE Posture service.
- Implement ISE Profiling.
- Understand Bring Your Own Device (BYOD) with ISE.
Troubleshoot ISE

Implementing Cisco Edge Network Security Solutions (SENSS)
Implementing Cisco Edge Network Security Solutions (SENSS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience to prepare them to configure Cisco perimeter edge security solutions utilizing Cisco Switches, Cisco Routers, and Cisco Adaptive Security Appliance (ASA) Firewalls. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls, Cisco Routers with the firewall feature set, and Cisco Switches.

Course Objectives

- Understanding and implementing Cisco modular Network Security Architectures such as SecureX and TrustSec.
- Deploy Cisco Infrastructure management and control plane security controls.
- Configuring Cisco layer 2 and layer 3 data plane security controls.
- Implement and maintain Cisco ASA Network Address Translations (NAT).
- Implement and maintain Cisco IOS Software Network Address Translations (NAT).
- Designing and deploying Cisco Threat Defense solutions on a Cisco ASA utilizing access policy and application and identity based inspection.
- Implementing Botnet Traffic Filters.
- Deploying Cisco IOS Zone-Based Policy Firewalls (ZBFW).
- Configure and verify Cisco IOS ZBFW Application Inspection Policy.

Implementing Cisco Secure Mobility Solutions (SIMOS)
Implementing Cisco Secure Mobility Solutions (SIMOS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. This course is designed to prepare network security engineers with the knowledge and skills they need to protect data traversing a public or shared infrastructure such as the Internet by implementing and maintaining Cisco VPN solutions.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Describe the various VPN technologies and deployments as well as the cryptographic algorithms and protocols that provide VPN security.
- Implement and maintain Cisco site-to-site VPN solutions.
- Implement and maintain Cisco FlexVPN in point-to-point, hub-and-spoke, and spoke-to-spoke IPsec VPNs.
- Implement and maintain Cisco clientless SSL VPNs.
• Implement and maintain Cisco AnyConnect SSL and IPsec VPNs.
• Implement and maintain endpoint security and dynamic access policies (DAP).

Implementing Cisco Threat Control Solutions (SITCS)
Implementing Cisco Threat Control Solutions (SITCS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Next Generation Firewall (NGFW) as well as Web Security, Email Security and Cloud Web Security. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls utilizing Cisco Next Generation product solution which integrates Cisco Prime Security Manager for managing identity policies.

Course Objectives
Upon completing this course, the learner will be able to meet these overall objectives:
• Understand Cisco ASA Next-Generation Firewall (NGFW)
• Deploy Cisco Web Security appliance to mitigate malware
• Configure Web Security appliance for acceptable use controls
• Configure Cisco Cloud Web Security Connectors
• Describe Cisco Email Security Solution
• Configure Cisco Email Appliance Incoming and Outgoing Policies
• Describe IPS Threat Controls
• Configure and Implement Cisco IPS Sensor into a Network.
Cisco Certified Network Professional Voice (CCNP Voice) validates advance knowledge and skills required to integrate into underlying network architectures. Furthermore, this certification validates a robust set of skills in implementing, operating, configuring, and troubleshooting a converged IP network. With a CCNP Voice certification, a network professional can create a collaboration solution that is transparent, scalable, and manageable. The CCNP Voice focuses on Cisco Unified Communications Manager (formerly Unified CallManager), quality of service (QoS), gateways, gatekeepers, IP phones, voice applications, and utilities on Cisco routers and Cisco Catalyst switches. Additionally, the integration and troubleshooting of Cisco Unified Communications applications are now covered in the CCNP Voice, specifically the Cisco Unity Connection and Cisco Unified Presence applications.

Prerequisite

Cisco CCNA Voice

Required Exam

• 642-437 CVOICE Implementing Cisco Unified Communications Voice over IP and QoS

• 642-447 CIPT1 Implementing Cisco Unified Communications Manager, Part 1

• 642-457 CIPT2 Implementing Cisco Unified Communications Manager, Part 2

• 642-427 TVOICE Troubleshooting Cisco Unified Communications

• 642-467 CAPPS Integrating Cisco Unified Communications Applications

Course Outline

Implementing Cisco Unified Communications Voice over IP and QoS

Chapter 1 Introducing Voice Gateways

The Role of Gateways
  Traditional Telephony Networks
  Cisco Unified Communications Overview
  Cisco Unified Communications Architecture
  Cisco Unified Communications Business Benefits
  Cisco Unified Communications Gateways
Gateway Operation
Comparing VoIP Signaling Protocols
Gateway Deployment Example
IP Telephony Deployment Models
   Single-Site Deployment
   Multisite WAN with Centralized Call-Processing Deployment
   Multisite WAN with Distributed Call-Processing Deployment
Clustering over the IP WAN Deployment
Modern Gateway Hardware Platforms
   Cisco 2900 Series Integrated Services Routers
   Cisco 3900 Series Integrated Services Routers
Well-Known Older Enterprise Models
   Cisco 2800 Series Integrated Services Routers
   Cisco 3800 Series Integrated Services Routers
Specialized Voice Gateways
   Cisco ATA 186
   Cisco VG248 Analog Phone Gateway
   Cisco AS5350XM Series Universal Gateway
   Cisco AS5400 Series Universal Gateway Platforms
   Cisco 7200 Series Routers
Gateway Operational Modes
   Voice Gateway Call Legs
   Voice-Switching Gateway
   VoIP Gateway
   Cisco Unified Border Element
How Voice Gateways Route Calls
Gateway Call-Routing Components
   Dial Peers
   Call Legs
Configuring POTS Dial Peers
   Matching a Dial Peer
   Matching Outbound Dial Peers
   Default Dial Peer
Direct Inward Dialing
   Two-Stage Dialing
   One-Stage Dialing
Configuration of Voice Ports
   Analog Voice Ports
   Signaling Interfaces
   Analog Voice Port Interfaces
Analog Signaling
   FXS and FXO Supervisory Signaling
   Analog Address Signaling
   Informational Signaling
   E&M Signaling
   E&M Physical Interface
   E&M Address Signaling
Configuring Analog Voice Ports
- FXS Voice Port Configuration
- FXO Voice Port Configuration
- E&M Voice Port Configuration

Trunks
- Analog Trunks
- Centralized Automated Message Accounting Trunk
- Direct Inward Dialing Trunk

Timers and Timing
- Verifying Voice Ports

Digital Voice Ports

Digital Trunks
- T1 CAS
- E1 R2 CAS
- Nonfacility Associated Signaling
  - Configuring a T1 CAS Trunk
  - Configuring T1 CAS Trunks: Inbound E&M FGD and Outbound FGD EANA Example
  - Configuring an E1 R2 Trunk Example
  - Configuring an ISDN Trunk

Verifying Digital Voice Ports
- Cross-Connecting a DS0 with an Analog Port

Echo Cancellation
- Echo Origin
- Talker Echo
- Listener Echo
- Echo Cancellation
- Echo Canceller Operation
- Echo Canceller Components
- Configuring Echo Cancellation

Voice Packets Processing with Codecs and DSPs

Codecs
- Impact of Voice Samples and Packet Size on Bandwidth

Evaluating Quality of Codecs
- Mean Opinion Score
- Perceptual Evaluation of Speech Quality
- Perceptual Evaluation of Audio Quality
- Test Method Comparison
- Codec Quality
- Evaluating Overhead
- Bandwidth Calculation Example
- Per-Call Bandwidth Using Common Codecs

Digital Signal Processors
- Hardware Conferencing and Transcoding Resources
- DSP Chip
- Codec Complexity
- Recommended Usage in Deployment Models
- Packet Voice DSP Module Conferencing
Chapter 2 Configuring Basic Voice over IP

Voice Coding and Transmission
  VoIP Overview
  Major Stages of Voice Processing in VoIP
  VoIP Components
    Sampling
    Quantization
    Coding
  VoIP Packetization
    Packetization Rate
    Codec Operations
    Packetization and Compression Example
  VoIP Media Transmission
    Real-Time Transport Protocol
    Real-Time Transport Control Protocol
    Compressed RTP
    Secure RTP
    VoIP Media Considerations
  Voice Activity Detection
    Bandwidth Savings
    Voice Port Settings for VAD
Voice Signaling Protocols: H.323
  H.323 Architecture
    H.323 Advantages
    H.323 Network Components
  H.323 Call Flows
    H.323 Slow Start Call Setup
    H.323 Slow Start Call Teardown
    H.225 RAS Call Setup
    H.225 RAS Call Teardown
  Codecs in H.323
    Negotiation in Slow Start Call Setup
    H.323 Fast Connect
H.323 Early Media
Configuring H.323 Gateways
  H.323 Gateway Configuration Example
Customizing H.323 Gateways
  H.323 Session Transport
  Idle Connection and H.323 Source IP Address
  H.225 Timers
  H.323 Gateway Tuning Example
Verifying H.323 Gateways

Voice Signaling Protocols: SIP
SIP Architecture
  Signaling and Deployment
  SIP Architecture Components
  SIP Servers
  SIP Architecture Examples
SIP Call Flows
  SIP Call Setup Using Proxy Server
  SIP Call Setup Using Redirect Server
SIP Addressing
  SIP Addressing Variants Example
  Address Registration
  Address Resolution
Codecs in SIP
  Delayed Offer
  Early Offer
  Early Media
Configuring Basic SIP
  User Agent Configuration
  Dial-Peer Configuration
  Basic SIP Configuration Example
Configuring SIP ISDN Support
  Calling Name Display
  Blocking and Substituting Caller ID
  Blocking and Substituting Caller ID Commands
Configuring SIP SRTP Support
  SIPS Global and Dial-Peer Commands
  SRTP Global and Dial-Peer Commands
  SIPS and SRTP Configuration Example
Customizing SIP Gateways
  SIP Transport
  SIP Source IP Address
  SIP UA Timers
  SIP Early Media
  Gateway-to-Gateway Configuration Example
  UA Example
Verifying SIP Gateways
  SIP UA General Verification
COURSE OUTLINE

SIP UA Registration Status
SIP UA Call Information
SIP Debugging Overview
Examining the INVITE Message
Examining the 200 OK Message
Examining the BYE Message

Voice Signaling Protocols: MGCP
MGCP Overview
MGCP Advantages
MGCP Architecture
MGCP Gateways
MGCP Call Agents
Basic MGCP Concepts
MGCP Calls and Connections
MGCP Control Commands
Package Types
MGCP Call Flows
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Other SAF and CCD Considerations

Troubleshooting Cisco Unified Communications

This portion of the program will cover knowledge and skills required to troubleshoot Cisco Unified Communications systems and solutions in different deployments. In addition, students will learn troubleshooting methodology, triage, resources, tools, and fixes for Cisco Unified Communications Manager and the new features such as Call Control Discovery, SIP Precondition, Extension Mobility Cross Cluster as well as dial plan troubleshooting including globalized call routing.

Integrating Cisco Unified Communications Applications

Chapter 1 Integrating Cisco Unified Communications Applications
Chapter 2 Cisco Unity Connection
Chapter 3 Cisco Unity Connection and Cisco Unified Communication Manager
Chapter 4 Cisco Unity Express
Chapter 5 VPIM
Chapter 6 Cisco Unified Presence Server (CUPS)
Cisco CCNP Wireless Bootcamp

About this Course

Cisco Certified Network Professional Wireless (CCNP Wireless) certification addresses the need for designing, implementing, and operating Cisco Wireless networks and mobility infrastructures. CCNP Wireless certification emphasizes wireless networking principles and theory. It also recognizes the expertise and technical acumen of wireless professionals who can assess and translate network business requirements into technical specifications that in turn, are incorporated into successful installations.

Required Exam

• 642-732 CUWSS Conducting Cisco Unified Wireless Site Survey
• 642-742 IUWVN Implementing Cisco Unified Wireless Voice Networks
• 642-747 IUWMS Implementing Cisco Unified Wireless Mobility Services
• 642-737 IAUWS Implementing Advanced Cisco Unified Wireless Security

Prerequisites

Cisco CCNA Wireless

Course Outline

Chapter 1: Introduction to Network Maintenance

• Foundation Topics
  - Understanding Maintenance Methods
  - Introducing Network Maintenance
  - Proactive Versus Reactive Network maintenance
  - Well-Known Network Maintenance Models
  - Adapting a Well-Known Network Maintenance Model
• Identifying Common Maintenance Procedures
  - Routine Maintenance Tasks
  - Benefits of Scheduled Maintenance
  - Managing Network Changes
  - Maintaining Network Documentation
  - Restoring Operation After Failure
  - Measuring Network Performance
• The Network Maintenance Toolkit
  - Basic Network Maintenance Tools
  - Network Documentation Tools
  - Incident Recovery Tools
  - Monitoring and Measuring tools
• OUTLINE ITEMS - STYLE =LIST PARAGRAPH LVL1

Chapter 2: Introduction to Troubleshooting Processes

• Troubleshooting Methods
  - Defining Troubleshooting
  - The Value of a Structured Troubleshooting Approach
  - Popular Troubleshooting Methods
  - The Top-Down Method
• Practice Exercise: Selecting a Troubleshooting Approach
• Using Troubleshooting Procedures
• Problem Report
  - Collect information
  - Examine Collected Information
  - Eliminate Potential Causes
  - Hypothesize Underlying Causes
  - Verify Hypothesis
  - Problem Resolution
• Including Troubleshooting in Routine Network Maintenance
  - The relationship between maintenance and troubleshooting tasks
  - Maintaining current network documentation
  - Establishing a baseline
  - Communicating throughout the troubleshooting process
  - Change management

Chapter 3: The Maintenance and Troubleshooting Toolbox

• Cisco IOS Diagnostic Tools
  - Filtering the Output of SHOW commands
  - Troubleshooting Connectivity
  - Troubleshooting Hardware
• Specialized Diagnostic Tools
  - Using specialized tools in the troubleshooting process
• Performing Packet Captures
• Creating a Baseline with SNMP and Netflow
  - SNMP
Chapter 4: Basic Cisco Catalyst Switch Troubleshooting

- VLAN Troubleshooting
  - Reviewing Layer 2 Switching
  - Layer 2 Troubleshooting Techniques
- Spanning Tree Protocol Troubleshooting
  - Reviewing STP Operation
  - Collecting Information About an STP Topology
  - STP Troubleshooting Issues
  - Troubleshooting Ether Channel
- Trouble Ticket: STP
  - Trouble Ticket #1
  - Suggested Solution

Chapter 5: Advanced Cisco Catalyst Switch Troubleshooting

- Resolving InterVLAN Routing Issues
  - Contrasting Layer 3 Switches with Routers
  - Control Plane and Data Plane Troubleshooting
  - Comparing Routed Switch Ports and Switched Virtual Interfaces
- Router Redundancy Troubleshooting
  - HSRP
  - Converging After a Router Failure
  - HSRP Verification and Troubleshooting
  - VRRP
  - GLBP
  - Troubleshooting VRRP and GLBP
- Cisco Catalyst Switch Performance Troubleshooting
  - Cisco Catalyst Switch Troubleshooting Targets
  - TCAM Troubleshooting
  - High CPU Utilization Level Troubleshooting
- Trouble Ticket: HSRP
  - Trouble Ticket #2
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Chapter 6: Introduction to Troubleshooting Routing Protocols

- Layer 3 Troubleshooting
  - Basic Routing Processes
  - Troubleshooting Basic Routing
- EIGRP Troubleshooting
  - Data Structures of IP Routing Protocols
  - Data Structures of EIGRP
  - EIGRP Operation
  - EIGRP Troubleshooting Commands
- Trouble Ticket: EIGRP
  - Trouble Ticket #3
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Chapter 7: OSPF and Route Redistribution Troubleshooting

- OSPF Troubleshooting
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  - OSPF Operation
  - OSPF Troubleshooting Commands
- Trouble Ticket: OSPF
  - Trouble Ticket #4
- Route Redistribution Troubleshooting
  - Route Redistribution Overview
  - Route Redistribution Troubleshooting Targets
- Trouble Ticket: Route Redistribution with EIGRP and OSPF
  - Trouble Ticket #5
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Chapter 8: Troubleshooting BGP and Router Performance Issues

- BGP Troubleshooting Issues
  - BGP Data Structures
  - BGP Troubleshooting commands
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  - Processes that commonly cause excessive CPU Utilization
  - Cisco IOS Commands used for troubleshooting high processor utilization
    - Understanding Packet Switching Methods
    - Operation of process switching
    - Operation of Fast Switching
    - Operation of Cisco Express Forwarding
    - Troubleshooting Packet Switching Modes
      - Excessive Memory Utilization
    - Common Memory Troubleshooting Targets
    - Excessive BGP Memory Use

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  - Securing the Management Plane
  - Securing the Control Plane
  - Securing the Data Plane
  - Troubleshooting Network Security Issues
- Security Troubleshooting Targets
- Configuring and Troubleshooting the Cisco IOS Firewall Feature
  - Configuring and Troubleshooting AAA
- Trouble Ticket: Cisco IOS Security
  - Trouble Ticket: #7
    - Issue #1: forgotten Enable Secret Password
    - Issue #2: An exec-timeout Parameter Set Too Low
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- NAT Troubleshooting
  - Types of NAT
  - Sample NAT Topology
  - Potential NAT Troubleshooting Issues
  - Order of Operations for an Interface
  - NAT Troubleshooting Syntax
- DHCP Troubleshooting
  - Basic DHCP Operation
  - DHCP Configurations
  - Potential DHCP Troubleshooting Issues
  - DHCP Troubleshooting Syntax
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Chapter 11: IP Communications Troubleshooting
- Voice Troubleshooting
  - Overview of IP Telephony
  - Design Considerations for Voice Networks
  - Cisco IP Phone boot-up process
  - Common Voice Troubleshooting Issues
  - Overview of Quality of Service
- Video troubleshooting
  - Introduction to IP-Based Video
  - Design Considerations for Video
  - Multicasting
  - Common Video Troubleshooting Issues
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- Reviewing IPv6
  - IPv6 Address Types
  - IPv6 Address Format
  - IPv6 Routing Options
  - Configuring IPv6 Support
  - Tunneling IPv6 through an IPv4 Tunnel
- OSPFv3 Troubleshooting

Chapter 12: IPv6 Troubleshooting
- Characteristics of OSPFv3
- Configuring OSPFv3
- Troubleshooting OSPFv3
- Trouble Ticket: IPv6 and OSPF
  - Trouble Ticket #11
  - Viewing Baseline Information
  - Troubleshoot and Resolve and Identified OSPFv3 Adjacency Issue
- RIPng Troubleshooting
  - Review RIPng Theory
  - RIPng Configuration Commands
  - Troubleshooting RIPng
- Trouble ticket: IPv6 and RIPng
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  - Viewing baseline Information
  - Troubleshoot and Resolve the Identified RIPng Issue

Chapter 13: Advanced Services Troubleshooting
- Application Network Services Troubleshooting
  - Application Optimization
  - NetFlow
  - IP SLAs
  - Network-Based Application Recognition
  - QoS
- Wireless Troubleshooting Targets
  - Introducing the Cisco Unified Wireless Network
  - Wired Network Issues Impacting Wireless Networks

Chapter 14: Large Enterprise Network Troubleshooting
- Remote Office Troubleshooting
  - VPN Types
  - Troubleshooting VPN Issues
- Complex Network Troubleshooting
  - Troubleshooting Complex Networks
  - Case Study Review
Certified Ethical Hacker (CEH)

About this Course

Security professionals remain in high demand. The Certified Ethical Hacker (CEH) is a one-of-a-kind certification designed to give the candidate a look inside the mind of a hacker. This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. CEH v8 provides a comprehensive ethical hacking and network security-training program to meet the standards of highly skilled security professionals. Hundreds of SMEs and authors have contributed towards the content presented in the CEH v8 courseware. Latest tools and exploits uncovered from the underground community are featured in the new package. When a student leaves this intensive 5 day class they will have hands on understanding and experience in Ethical Hacking.

Audience Profile

This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

At Course Completion

After completing this course, you will learn:

- Footprinting and reconnaissance
- Hacking web servers, web applications, and wireless networks
- Cryptography
- Penetration testing
- Social engineering
- Trojans, viruses, and worms
- Evading IDS, firewalls, and honeypots
- Enumeration
- Buffer overflows

Prerequisites

At least two years of IT security experience and a strong working knowledge of TCP/IP. CompTIA Security+ course is highly recommended.

Course Outline

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- **Hacking: Fun or Criminal Activity?**
- The Evolution and Growth of Hacking
- What Is an Ethical Hacker?
- Ethical Hacking and Penetration Testing
- Hacking Methodologies
- Vulnerability Research and Tools
- Ethics and the Law
- Summary

**Chapter 2 System Fundamentals**

- Exploring Network Topologies
- Working with the Open Systems Interconnection Model
- Dissecting the TCP/IP Suite
- IP Subnetting
- Hexadecimal vs. Binary
- Exploring TCP/IP Ports
- Domain Name System
- Understanding Network Devices
- Routers and Switches
- Working with MAC Addresses
- Proxies and Firewalls
- Intrusion Prevention and Intrusion Detection Systems
- Network Security
- Knowing Operating Systems

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**Chapter 3 Cryptography**

- Cryptography: Early Applications and Examples
- History of Cryptography
- Tracing the Evolution
- Cryptography in Action
- So How Does It Work?
- Symmetric Cryptography
- Asymmetric, or Public Key, Cryptography
- Understanding Hashing
- Issues with Cryptography
- Applications of Cryptography
- IPSec
- Pretty Good Privacy
- Secure Sockets Layer (SSL)
- Summary

**Chapter 4 Footprinting and Reconnaissance**

- Understanding the Steps of Ethical Hacking
- Phase 1: Footprinting
Certified Ethical Hacker (CEH)

Phase 2: Scanning

Phase 3: Enumeration

Phase 4: System Hacking

What Is Footprinting?

Why Perform Footprinting?

Goals of the Footprinting Process

Terminology in Footprinting

Open Source and Passive Information Gathering

Active Information Gathering

Pseudonymous Footprinting

Internet Footprinting

Threats Introduced by Footprinting

The Footprinting Process

Using Search Engines

Location and Geography

Social Networking and Information Gathering

Financial Services and Information Gathering

The Value of Job Sites

Working with E-mail

Competitive Analysis

Google Hacking

Gaining Network Information

Social Engineering: The Art of Hacking Humans

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What Is Network Scanning?

Checking for Live Systems

Wardialing

Wardriving

Pinging

Port Scanning

Checking for Open Ports

Types of Scans

Full Open Scan

Stealth Scan, or Half-open Scan

Xmas Tree Scan 113

FIN Scan

NULL Scan

ACK Scanning

UDP Scanning

OS Fingerprinting

Banner Grabbing

Countermeasures

Vulnerability Scanning

Drawing Network Diagrams

Using Proxies
Certified Ethical Hacker (CEH)

Setting a Web Browser to Use a Proxy

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Scanning

What Is Enumeration?

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Groups

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Commonly Exploited Services

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SuperScan

The PsTools Suite

Enumeration with SNMP

Management Information Base

SNScan

Unix and Linux Enumeration

finger

rpcinfo

showmount

Enum4linux

LDAP and Directory Service Enumeration

Enumeration Using NTP

SMTP Enumeration

Using VRFY

Using EXPN

Using RCPT TO

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Up to This Point

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Authentication on Microsoft Platforms

Executing Applications

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Malware and the Law

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| Chapter 16 Evading IDSs, Firewalls, and Honeypots |
Honeypots, IDSs, and Firewalls

The Role of Intrusion Detection Systems

Firewalls

What’s That Firewall Running?

Honeypots

Run Silent, Run Deep: Evasion Techniques

Evading Firewalls

Summary

Chapter 17 Physical Security

Introducing Physical Security

Simple Controls

Dealing with Mobile Device Issues

Securing the Physical Area

Defense in Depth
CEH: Certified Ethical Hacker v7 Course Description

This class will immerse the students into an interactive environment where they will be shown how to scan, test, hack and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. CEHv7 provides a comprehensive ethical hacking and network security-training program to meet the standards of highly skilled security professionals. Hundreds of SMEs and authors have contributed towards the content presented in the CEHv7 courseware. Latest tools and exploits uncovered from the underground community are featured in the new package. When a student leaves this intensive 5 day class they will have hands on understanding and experience in Ethical Hacking.

CEH v7 Features and Enhancements Includes:

- CEH v7 showcases the latest hacking techniques and countermeasures.
- Updated core content and well-organized flow for a best-in-class learning experience.
- Exclusive section for countermeasures against different attacks with detailed explanation of how to implement the countermeasures in a real-time environment.
- Attractive and descriptive diagrammatic representations of concepts and attacks.
- Complete section dedicated to penetration testing, illustrating how to implement learned concepts to test network system security.
- Courseware includes over 20GB of the latest hacking and security tools.
- A result-oriented, descriptive lab manual; the labs showcased in the courseware are tested against the latest Operating Systems with all patches and hot fixes applied
- CEH v7 meets Government and DoD compliance with Federal Information Security Management Act (FISMA) and DoD Directive 8570.1-M.
- Over 1000 minutes of video demonstrations and more.

Intended Audience for the CEH: Certified Ethical Hacker v7 Course

- This course will significantly benefit security officers, auditors, security professionals, site administrators, and anyone who is concerned about the integrity of the network infrastructure.

CEH: Certified Ethical Hacker v7 Course Objectives

- Students will begin by understanding perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed.
- Students then learn how intruders escalate intruders escalate privileges and what steps can be taken to secure a system.
- Students will also learn about Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows and Virus Creation.
CEH: Certified Ethical Hacker v7 Course Outline

I. Introduction to Ethical Hacking
II. Footprinting and Reconnaissance
III. Scanning Networks
IV. Enumeration
V. System Hacking
VI. Trojans and Backdoors
VII. Viruses and Worms
VIII. Sniffers
IX. Social Engineering
X. Denial of Service
XI. Session Hijacking
XII. Hacking Webservers
XIII. Hacking Web Applications
XIV. SQL Injection
XV. Hacking Wireless Networks
XVI. Evading IDS, Firewalls and Honeypots
XVII. Buffer Overflows
XVIII. Cryptography
XIX. Penetration Testing
The Cisco CCNA Collaboration certification is a job-role focused training and certification program. It will allow you to maximize your investment in your education, and increase your professional value by giving you the skills to help your IT organization meet increased business demands resulting from these technology transitions.

For network video engineers, collaboration engineers, IP telephony and IP network engineers who want to develop and advance their collaboration and video skills in line with the convergence of voice, video, data and mobile applications.

Upon successful completion of this course, students will master the following:

- Cisco Unified Communications components
- Cisco Unified Communications Manager Express administration, end user management, dial plans, and telephony features
- Cisco Unified Communications Manager administration, end point management, dial plan elements and interactions, and telephony and mobility features
- Cisco Unity Connection voicemail
- CM IM and Presence support
- CME and CUCM management and troubleshooting
- Monitoring Cisco Unity Connection

No Prerequisites

Components of the PSTN
Understanding PBX and Key Systems
Connections To and Within the PSTN
PSTN Numbering Plans
The Emergence of VoIP
VoIP: Why It Is a Big Deal for Businesses
The Process of Converting Voice to Packets
The Role of Digital Signal Processors
Understanding RTP and RTCP
Review All the Key Topics
CISCO CCNA Collaboration
CS110

Chapter 2 Understanding the Components of Cisco Unified Communications

Unified Collaboration
Understanding Cisco Unified Communications Manager Express
CME Key Features
CME Interaction with Cisco IP Phones
Understanding Cisco Unified Communications Manager
CUCM Key Features
CUCM Database Replication and Interacting with Cisco IP Phones
Understanding Cisco Unity Connection
Cisco Unity Connection Key Features
Cisco Unity Connection and CUCM Interaction
Understanding Cisco Unified CM IM and Presence
Cisco Jabber
Understanding Video Communication Server and TelePresence Management Suite
Cisco VCS Control and VCS Expressway
TelePresence Management Suite
Review All the Key Topics
Complete the Tables from Memory
Definitions of Key Terms

Chapter 3 Understanding Cisco IP Phones

Connecting and Powering Cisco IP Phones
Cisco Catalyst Switch PoE
Powering the IP Phone Using a Power Patch Panel or Coupler
Powering the IP Phone with a Power Brick
VLAN Concepts and Configuration
VLAN Review
VLAN Trunking/Tagging
Understanding Voice VLANs
VLAN Configuration
Understanding the Cisco IP Phone Boot Process
Configuring a Router-Based DHCP Server
Setting the Clock of a Cisco Device with NTP IP Phone Registration
Quality of Service
Understanding the Enemy Requirements for Voice, Video, and Data Traffic
Network Requirements for Voice and Video
Network Requirements for Data QoS Mechanisms
Link Efficiency Mechanisms
Queuing Algorithms

Chapter 4 Getting Familiar with CME Administration

Preparing the CME Router for Cisco Configuration Professional
Managing CME Using CCP
CME Integrated GUI
Cisco Configuration Professional
Review All the Key Topics
Complete the Tables from Memory
Definitions of Key Terms

Chapter 5 Managing Endpoints and End Users in CME

Describe End Users in CME
User Access Levels in CME
Creating Users in CME
Creating Users with the CME GUI
Enabling the CME Built-In GUI Using the CME Built-In GUI to Create the Customer Admin
Create or Modify End Users and Endpoints in CME Using the CCP GUI
General Capabilities of CCP
CCP Unified Communications Configuration
Implementing End Users and Endpoints in CME
Review All Key Topics
Complete the Tables from Memory
Define Key Terms

Chapter 6 Understanding the CME Dial Plan

Configuring Physical Voice Port Characteristics
Configuring Analog Voice Ports
FXS Ports
FXO Ports
Configuring Digital Voice Ports
Understanding and Configuring Dial Peers Voice Call Legs
Configuring POTS Dial Peers
Configuring VoIP Dial Peers
Using Dial Peer Wildcards
Private Line Automatic Ringdown
Understanding Router Call Processing and Digit Manipulation
Matching Inbound and Outbound Dial Peers
Using Digit Manipulation
Practical Scenario 1: PSTN Failover Using the prefix
Command
  Practical Scenario 2: Directing Operator Calls to the Receptionist
  Practical Scenario 3: Specific POTS Lines for Emergency Calls
  Practical Scenario 4: Using Translation Profiles
  Using CCP to Configure a CME Dial Plan

Understanding and Implementing CME Class of Restriction
Using CCP to Implement COR
Review All the Key Topics
Definitions of Key Terms

Chapter 7 Enabling Telephony Features with CME

Configuring a Voice Network Directory
Configuring Call Forwarding
  Forwarding Calls from the IP Phone
  Forwarding Calls from the CLI
  Using the call-forward pattern Command to Support H.450.3
Configuring Call Transfer
Configuring Call Park
Configuring Call Pickup
Configuring Intercom
Configuring Paging
Configuring After-Hours Call Blocking
Configuring CDRs and Call Accounting
Configuring Music on Hold
Configuring Single Number Reach
Configuring Ephone Hunt Groups
  Final Forwarding Options for Hunt Groups
Configuring Night Service Using CCP
Configuring Shared Ephone-dn Using CCP
Describe Extension Mobility in CME
Review All the Key Topics
Definitions of Key Terms

Part III Cisco Unified Communications Manager

Chapter 8 Administrator and End-User Interfaces

Describe the CUCM Administration Interfaces
  Cisco Unity Connection Administration
  Cisco Unity Connection Serviceability
  Describe the Cisco Unified CM IM and Presence Server Administration Interfaces
  Cisco CM-IM and Presence Administration Interface
  Cisco Unified IM and Presence Serviceability
Describe the End-User Interface for CUCM
Review All the Key Topics
Definitions of Key Terms

Chapter 9 Managing Endpoints and End Users in CUCM

Implementing IP Phones in CUCM
  Special Functions and Services Used by IP Phones
    NTP
    CDP
    DHCP
    PoE
    TFTP
    DNS
  IP Phone Registration Process
  SIP Phone Registration Process
  Preparing CUCM to Support Phones
  Service Activation
  DHCP Server Configuration
  Configuring DHCP in Router IOS
  IP Phone Configuration Requirements in CUCM
    Device Pool
    Device Defaults
    Softkey Template and Phone Button Template Profiles
Add Phone in CUCM
  Manual Configuration of IP Phones
  Auto-Registration of IP Phones
  Bulk Administration Tool
  Auto Register Phone Tool
  Self-Provisioning
Describe End Users in CUCM
  End Users Versus Application Users
  Credential Policy
  Features Interacting with User Accounts
  User Locale
  Device Association
Implementing End Users in CUCM
  Manual Entry
  Bulk Import Using BAT
  LDAP Integration
    LDAP Synchronization
    LDAP Authentication
    LDAP Integration Considerations
    LDAP Sync Agreements
    LDAP Sync Mechanism
    LDAP Custom Filters
  Configure LDAP Sync
  LDAP Synchronization
CISCO CCNA Collaboration
CS110

Chapter 10 Understanding CUCM Dial Plan Elements and Interactions

CUCM Call Flows
- Call Flow in CUCM If DNS Is Used
- Call Flow in CUCM If DNS Is Not Used
- Centralized Remote Branch Call Flow
- Centralized Deployment PSTN Backup Call Flow
- Centralized Deployment Considerations and Limitations

PSTN Backup Using CAC
Distributed Deployment Call Flow
Call Routing Sources in CUCM
Call Routing Destinations in CUCM
Call Routing Configuration Elements
- Route Pattern
- Route List
- Route Group
- Gateways and Trunks
Call Routing Behavior
- Digit Analysis
- Hunt Groups
Class of Control
- Partition
- Calling Search Space
- Interaction of Partitions and Calling Search Spaces
Line Device Configuration
Review All the Key Topics
Definitions of Key Terms

Chapter 11 Enabling Telephony and Mobility Features with CUCM

Describe Extension Mobility in CUCM
Enable EM in CUCM
Describe Telephony Features in CUCM
Call Coverage
- Call Forward
- Shared Lines
- Barge and Privacy
- Call Pickup
- Call Hunting
- Call Park
- Intercom

CUCM Native Presence
- Presence Architecture
Enable Telephony Features in CUCM
- Enabling Call Coverage
- Configuring Shared Lines
- Configuring Barge
- Configuring Call Pickup
- Configuring Call Park and Directed Call Park
- Configuring Call Hunting
- Configuring Intercom Features
- Configure CUCM Native Presence
- Configuring BLF Speed Dials
- Configuring Presence-Enabled Call Lists
- Configuring Custom Presence Groups
Review All the Key Topics
Definitions of Key Terms

Chapter 12 Enabling Mobility Features in CUCM

Understanding CUCM Mobility Features
- Describe Mobile Connect
- Unified Mobility Architecture
- Access Lists
- Time-of-Day Access
- Mobile Voice Access
Implementing Mobility Features in CUCM
- Configuring Mobile Connect
- Step 1: Configure Softkey Templates
- Step 2: Configure User Accounts for Mobility
- Step 3: Configure the IP Phone to Support
- Mobility Features
- Step 4: Create Remote Destination Profiles
- Step 5: Add Remote Destinations to Remote Destination Profiles
- Step 6: Configure Ring Schedules for Each Remote Destination
- Step 7: Configure Access Lists
- Step 8: Apply Access Lists
- Step 9: Configure Service Parameters
- Configuring MVA
- Step 1: Activate the MVA Service
- Step 2: Configure Service Parameters
- Step 3: Enable MVA for Each User
- Step 4: Configure the MVA Media Resource
- Step 5: Configure the MVA VXML Application at the IOS Gateway
Review All the Key Topics
Definitions of Key Terms

Part IV Voicemail and Presence Solutions

Chapter 13 Voice Messaging Integration with Cisco Unity Connection
Describe Cisco Unity Connection
   Overview of Cisco Unity Connection
   Single-Site and Multisite Deployment Considerations
CUC Integration Overview
   CUC Integration with CUCM Using SCCP
   CUC Integration Using SIP
CUC Features
   System Settings
   Enterprise Parameters and Service Parameters
   LDAP
   Call Handlers
   Call Routing
   Direct Routing Rules
   Forwarded Routing Rules
   Call Routing Rule Filters
   Distribution Lists
   Authentication Rules
   Dial Plan
Describe Cisco Unity Connection Users and Mailboxes
   User Templates
      User Template Basics
      Password Settings
      Roles
      Transfer Rules and Greetings
      Call Actions
      Message Settings, Message Actions, and Caller Input
   TUI Settings
CUC End Users
   Extension and Call Forward Options
   Voice Messaging with SRST and AAR
   Voicemail Box
   Private Distribution Lists
   Notification Devices
User Creation Options
CUC Voicemail Boxes
   Message Aging Policy and Mailbox Quotas
Implement Cisco Unity Connection Users and Mailboxes
Configure End User Templates
   User Template Basics
   Password Settings
   Roles
   Message Settings
   Message Actions
   Phone Menu
   Playback Message Settings
   Notification Devices
Configure CUC End Users
   Manual Process
   Alternate Extensions and Names
   Private DLs
Importing End Users into CUC
   Importing Users from CUCM
   Importing Users from LDAP
   Bulk Administration Import of CUC Users
   Managing the CUC Message Store
   Mailbox Stores Membership
   Message Aging Policy
Mailbox Quotas
Review All the Key Topics
Definitions of Key Terms

Chapter 14 Enabling CM IM and Presence Support
Describe CM-IMP Features
   Jabber
      Jabber Operating Modes
      Enterprise Instant Messaging
      Voice Calls
      Video Calls
      Integration Support
      Cisco Unified Client Services Framework
      Cisco Unified Communications Manager IP Phone Service
Describe Cisco Unified Presence Architecture
   Integration with Microsoft Office Communications Server
      Integration with LDAP
      Integration with Cisco Unity Connection
      Integration with Conferencing Resources
      Integration with Calendar Resources
      Architecture and Call Flow: Softphone Mode
      Architecture and Call Flow: Deskphone Control Mode
      IM/Chat, Compliance, and Persistent Chat
      CM-IMP and QoS Considerations
Enabling CM-IMP
   Enabling End Users for Cisco Jabber in CUCM
      Step 1: Configure End Users in CUCM
      Step 2: Associate the Directory Numbers with the End Users in CUCM
      Step 3: Create a Cisco Unified CSF Device
      Step 4: Associate the CSF Device with the End User in CUCM
   Enabling End Users for Jabber in CM-IMP
   Troubleshooting Jabber
Review All the Key Topics
Definitions of Key Terms

Part V Voice Network Management and Troubleshooting

Chapter 15 Common CME Management and Troubleshooting Issues
Troubleshooting
   Troubleshooting Common CME Registration Issues
      Issue 1: Verifying PoE
      Issue 2: Voice VLAN Assignment
      Issue 3: DHCP Server
      Issue 4: TFTP Server
      Issue 5: CME Server
Chapter 16 CUCM Monitoring, Maintenance, and Troubleshooting

Describe How to Provide End-User Support for Connectivity and Voice
   - Quality Issues
   - Troubleshooting
   - Troubleshooting IP Phone Registration Problems
   - Deleting Unassigned Directory Numbers Using the Route Plan Report

Describe CUCM Reports and How They Are Generated
   - Generating Reports
   - Analyzing Reports
   - Understanding CUCM CDR Analysis and Reporting Tool Reports
     - Activate CAR-Related Services
     - Configure CDR Service Parameters
       - CAR Tool Users
     - CDR and CMR Architecture
       - CAR System Parameters
     - Exporting CDR and CMR Records
     - Generating CDR Reports
     - Report Generation Example
     - Generating System Reports
     - Generating Device Reports

Describe Cisco Unified RTMT
   - RTMT Interface
   - Monitoring CUCM with RTMT
     - Voice and Video Summary
     - Gateway Activity
     - Device Search
     - Database Summary
     - Call Activity
     - Alert Central

Chapter 17 Monitoring Cisco Unity Connection

Generating and Accessing Cisco Unity Connection Reports
   - Cisco Unity Connection Serviceability Reports
   - Cisco Unified Serviceability: Serviceability Reports Archive

Analyzing Cisco Unity Connection Reports
   - Troubleshooting and Maintenance Operations Using Cisco Unity Connection Reports
     - Reports to Support Routine Maintenance

Review All the Key Topics
Definitions of Key Terms

Chapter 18 Final Preparation

Tools for Final Preparation
   - Exam Engine and Questions on the CD
     - Install the Exam Engine
     - Activate and Download the Practice Exam
     - Activating Other Exams
       - Premium Edition

The Cisco Learning Network
   - Memory Tables
   - Chapter-Ending Review Tools
   - Study Plan
   - Recall the Facts
   - Practice Configurations

Using the Exam Engine
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

About this Course
Cisco Certified Network Professional Security (CCNP Security) Boot Camp program is aligned specifically to the job role of the Cisco Network Security Engineer responsible for Security in Routers, Switches, Networking devices and appliances, as well as choosing, deploying, supporting and troubleshooting Firewalls, VPNS, and IDS/IPS solutions for their networking environments.

Prerequisites
CCNA Security certification

Course Outline
CCNP Security Boot Camp is consisted of the following four courses:

Implementing Cisco Secure Access Solutions (SISAS)
Implementing Cisco Secure Access Solutions (SISAS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Identity Services Engine and 802.1X secure network access. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed network access security by utilizing Cisco ISE appliance product solution.

Course Objectives
Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco Identity Services Engine architecture and access control capabilities.
- Understand 802.1X architecture, implementation and operation.
- Understand commonly implemented Extensible Authentication Protocols (EAP).
- Implement Public-Key Infrastructure with ISE.
- Understand the implement Internal and External authentication databases.
- Implement MAC Authentication Bypass.
- Implement identity based authorization policies.
- Understand Cisco TrustSec features.
- Implement Web Authentication and Guest Access.
- Implement ISE Posture service.
- Implement ISE Profiling.
- Understand Bring Your Own Device (BYOD) with ISE.
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

COURSE OUTLINE

- Troubleshoot ISE

Implementing Cisco Edge Network Security Solutions (SENSS)
Implementing Cisco Edge Network Security Solutions (SENSS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience to prepare them to configure Cisco perimeter edge security solutions utilizing Cisco Switches, Cisco Routers, and Cisco Adaptive Security Appliance (ASA) Firewalls. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls, Cisco Routers with the firewall feature set, and Cisco Switches.

Course Objectives
- Understanding and implementing Cisco modular Network Security Architectures such as SecureX and TrustSec.
- Deploy Cisco Infrastructure management and control plane security controls.
- Configuring Cisco layer 2 and layer 3 data plane security controls.
- Implement and maintain Cisco ASA Network Address Translations (NAT).
- Implement and maintain Cisco IOS Software Network Address Translations (NAT).
- Designing and deploying Cisco Threat Defense solutions on a Cisco ASA utilizing access policy and application and identity based inspection.
- Implementing Botnet Traffic Filters.
- Deploying Cisco IOS Zone-Based Policy Firewalls (ZBFW).
- Configure and verify Cisco IOS ZBFW Application Inspection Policy.

Implementing Cisco Secure Mobility Solutions (SIMOS)
Implementing Cisco Secure Mobility Solutions (SIMOS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. This course is designed to prepare network security engineers with the knowledge and skills they need to protect data traversing a public or shared infrastructure such as the Internet by implementing and maintaining Cisco VPN solutions.

Course Objectives
Upon completing this course, the learner will be able to meet these overall objectives:
- Describe the various VPN technologies and deployments as well as the cryptographical algorithms and protocols that provide VPN security.
- Implement and maintain Cisco site-to-site VPN solutions.
- Implement and maintain Cisco FlexVPN in point-to-point, hub-and-spoke, and spoke-to-spoke IPsec VPNs.
- Implement and maintain Cisco clientless SSL VPNs.
- Implement and maintain Cisco AnyConnect SSL and IPsec VPNs.
- Implement and maintain endpoint security and dynamic access policies (DAP).
Cisco Certified Network Professional Security (CCNP Security) Boot Camp

COURSE OUTLINE

Implementing Cisco Threat Control Solutions (SITCS)

Implementing Cisco Threat Control Solutions (SITCS) is part of the curriculum path leading to the Cisco Certified Network Professional Security (CCNP Security) certification. Additionally, it is designed to prepare security engineers with the knowledge and hands-on experience so that they can deploy Cisco’s Next Generation Firewall (NGFW) as well as Web Security, Email Security and Cloud Web Security. The goal of the course is to provide students with foundational knowledge and the capabilities to implement and managed security on Cisco ASA firewalls utilizing Cisco Next Generation product solution which integrates Cisco Prime Security Manager for managing identity policies.

Course Objectives

Upon completing this course, the learner will be able to meet these overall objectives:

- Understand Cisco ASA Next-Generation Firewall (NGFW)
- Deploy Cisco Web Security appliance to mitigate malware
- Configure Web Security appliance for acceptable use controls
- Configure Cisco Cloud Web Security Connectors
- Describe Cisco Email Security Solution
- Configure Cisco Email Appliance Incoming and Outgoing Policies
- Describe IPS Threat Controls
- Configure and Implement Cisco IPS Sensor into a Network.
About this Course

You will analyze a wide range of information systems security subjects that are organized into 10 domains for CISSP exam certification.

Audience Profile

This course is intended for experienced IT security-related practitioners, auditors, consultants, investigators, or instructors, including network or security analysts and engineers, network administrators, information security specialists, and risk management professionals, who are pursuing CISSP training and certification to acquire the credibility and mobility to advance within their current computer security careers or to migrate to a related career. Through the study of all 10 CISSP CBK domains, students will validate their knowledge by meeting the necessary preparation requirements to qualify to sit for the CISSP certification exam. The CISSP exam is intentionally difficult and should not be taken lightly. Even students with years of security experience should assume that they will have additional study time after class. Because the domains are so varied, it is unlikely that any one student will have experience in all 10 domains. Additional CISSP certification requirements include a minimum of five years of direct professional work experience in one or more fields related to the 10 CBK security domains, or a college degree and four years of experience.

Prerequisites

It is highly recommended that students have certifications in Network+ or Security+, or possess equivalent professional experience upon entering CISSP training. It will be beneficial if students have one or more of the following security-related or technology-related certifications or equivalent industry experience: MCSE, MCTS, or CCNP.

Course Content

Lesson 1: Information Systems Access Control

- **Topic 1A**: Data Access Principles
- **Topic 1B**: System Access and Authentication
- **Topic 1C**: Attacks and Penetration Tests

Lesson 2: Security Architecture and Design

- **Topic 2A**: Security Architecture Frameworks and Security Models
- **Topic 2B**: Security Modes
- **Topic 2C**: System Assurance
Lesson 3: Network and Telecommunications Security

  Topic 3A: Data Network Design
  Topic 3B: Remote Data Access
  Topic 3C: Data Network Security
  Topic 3D: Data Network Management

Lesson 4: Information Security Management Goals

  Topic 4A: Organizational Security
  Topic 4B: The Application of Security Concepts

Lesson 5: Information Security Classification and Program Development

  Topic 5A: Information Classification
  Topic 5B: Security Program Development

Lesson 6: Risk Management and Ethics

  Topic 6A: Risk Management
  Topic 6B: Ethics

Lesson 7: Software Development Security

  Topic 7A: Software Configuration Management
  Topic 7B: Software Controls
  Topic 7C: Database System Security

Lesson 8: Cryptography

  Topic 8A: Ciphers and Cryptography
  Topic 8B: Symmetric-Key Cryptography
  Topic 8C: Asymmetric-Key Cryptography
  Topic 8D: Hashing and Message Digests
  Topic 8E: Email, Internet, and Wireless Security
  Topic 8F: Cryptographic Weaknesses

Lesson 9: Physical Security

  Topic 9A: Physical Access Control
  Topic 9B: Physical Access Monitoring
  Topic 9C: Physical Security Methods
  Topic 9D: Facilities Security

Lesson 10: Operations Security

  Topic 10A: Operations Security Control
  Topic 10B: Operations Security Auditing and Monitoring
  Topic 10C: Operational Threats and Violations
Lesson 11: Business Continuity and Disaster Recovery Planning

- **Topic 11A**: Business Continuity Plan Fundamentals
- **Topic 11B**: Business Continuity Plan Implementation
- **Topic 11C**: Disaster Recovery Plan Fundamentals
- **Topic 11D**: Disaster Recovery Plan Implementation

Lesson 12: Legal, Regulations, Compliance, and Investigations

- **Topic 12A**: Computer Crime Laws and Regulations
- **Topic 12B**: Computer Crime Incident Response

Appendix A: Mapping CISSP® Course Content to the (ISC)² CISSP Exam Objectives
About this Course

The mobile age is upon us. More and more people are using tablets, smartphones, and other mobile devices to accomplish things in their personal and professional lives. As businesses embrace this trend, they need to support their employees in the use of mobile devices while protecting their own assets, such as intellectual property.

If you are already a traditional network support technician, you're well on the way to having the knowledge and skills needed to support the mobile workforce. This course builds on your existing knowledge and experience to provide you with critical concepts related to over-the-air technologies, wireless networking, and mobile devices.

Audience Profile

Students taking this course are IT support personnel or prospective support personnel who have at least one year of experience working with computer networks, and who want to further develop their IT skills to include mobile device and wireless support.

This course is also for students seeking the CompTIA® Mobility+® certification.

At Course Completion

Upon successful completion of this course, you will be able to support mobile cellular and wireless devices. They will:

You will:

- Configure over-the-air technologies.
- Apply RF principles.
- Implement a wireless network infrastructure.
- Implement network infrastructure devices and services.
- Implement mobile solutions.
- Prepare the enterprise for a mobile network.
- Deploy mobile devices.
- Implement mobile device operations.
- Maintain mobile device operations.
- Deploy mobile applications and related technologies.
- Implement mobile app protocols and services.
- Implement mobile security.
- Mitigate mobile network risk.
• Implement incident response.
• Troubleshoot mobile devices and networks.

**Prerequisites**

To ensure your success in this course, you should have experience working with computer hardware, networking, and Windows operating systems. You can obtain this level of skills and knowledge by taking the following ATG Learning courses:

- *CompTIA® A+® Certification*
- *CompTIA® Network+® Certification*

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**Lesson 6: Preparing the Enterprise for a Mobile Network**

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Lesson 8: Implementing Mobile Device Operations

Topic A: Distribute Centralized Content

Topic B: Implement Deployment Best Practices

Topic C: Configure Remote Capabilities

Lesson 9: Maintaining Mobile Device Operations

Topic A: Manage Lifecycle Operations

Topic B: Back Up, Recover, and Segregate Data

Topic C: Stay Current with New Technologies

Lesson 10: Deploying Mobile Applications and Related Technologies

Topic A: Choose Mobile App Types

Topic B: Determine In-house Application Development Requirements

Topic C: Implement Push Notification

Lesson 11: Implementing Mobile App Protocols and Services

Topic A: Configure Mobile Applications

Topic B: Implement Proxy and Gateway Settings

Topic C: Implement Information Traffic Topology

Lesson 12: Implementing Mobile Security

Topic A: Implement Encryption Methods

Topic B: Implement Access Control

Topic C: Implement PKI

Topic D: Implement Security Monitoring

Lesson 13: Mitigating Mobile Network Risk

Topic A: Identify Risks and Threats

Topic B: Implement Mitigation Techniques

Lesson 14: Implementing Incident Response

Topic A: Identify an Incident

Topic B: Create and Execute a Policy-Based Response

Topic C: Report an Incident

Lesson 15: Troubleshooting Mobile Devices and Networks

Topic A: Implement Troubleshooting Methodology

Topic B: Troubleshoot Device Problems

Topic C: Troubleshoot Application Problems

Topic D: Troubleshoot Over-the-Air Connectivity Problems

Topic E: Troubleshoot Security Problems

Appendix A: Mapping Course Content to CompTIA Mobility+ Exam MB0-001

Appendix B: CompTIA Mobility+ Acronyms
Course 10174B: Configuring and Administering Microsoft SharePoint 2010

About this Course
This five-day instructor-led course teaches students how to install, configure, and administer Microsoft SharePoint and also how to manage and monitor sites and users by using Microsoft SharePoint 2010. It will also cover the new features and functionality introduced with SharePoint 2010 Sp1 as well as Offices 365's SharePoint Online.

Audience Profile
This course is intended for IT professionals who are experienced Windows Server 2003 or 2008 administrators and are interested in learning how to administer SharePoint 2010 or SharePoint Online. The course is also intended for part-time Business Application Administrators (BAAs) who are engaged in administering Line of Business (LOB) applications in conjunction with internal business customers.

Course Outline

Module 1: Introducing Microsoft SharePoint 2010
This module provides an overview of SharePoint 2010 and SharePoint Online. It will prepare students for the installation of the first server in a SharePoint 2010 farm and give details on SharePoint 2010 Sp1 and SharePoint Online. Lessons

- Evaluating the Features of Microsoft SharePoint 2010
- Preparing for SharePoint 2010
- Installing SharePoint 2010
- Advanced Installation of SharePoint 2010

Lab: Installing SharePoint 2010

- Exercise 1: Creating Active Directory Accounts for SharePoint
- Exercise 2: Installing SharePoint Server Prerequisites
- Exercise 3: Installing SharePoint Server
- Exercise 4: Configuring the SharePoint Installation
- Exercise 6 (Optional): Installing a Language Pack

After completing this module, students will be able to:

- Evaluate the Features of SharePoint 2010
- Prepare for SharePoint 2010
- Install SharePoint 2010
- Perform an Advanced Installation of SharePoint 2010

Module 2: Creating a SharePoint 2010 Intranet
This module covers creating a SharePoint 2010 Intranet and shows students how to configure and administer the fundamental components of a
SharePoint farm, including its configuration, logical structure, user-facing features, and underlying engine.

**Lessons**

- Performing Initial Farm Configuration
- Configuring the SharePoint Logical Structure
- Exploring the SharePoint Web Application and Physical Architecture

**Lab : Creating a SharePoint 2010 Intranet**

- Exercise 1: Creating a Web Application
- Exercise 2: Creating a Site Collection
- Exercise 3: Creating a Site Collection in a New Content Database

After completing this module, students will be able to:

- Perform Initial Farm Configuration
- Configure the SharePoint Logical Structure
- Explore the SharePoint Web Application and Physical Architecture

**Module 3: Administering and Automating SharePoint**

This module covers Administering and Automating SharePoint. It covers how to apply the full range of options for administering and automating SharePoint—Central Administration, STSADM, and PowerShell. The module also introduces students to the logs.

**Lessons**

- Configuring Central Administration
- Administering SharePoint from the Command Line
- Automating SharePoint Operations with Windows PowerShell

**Lab : Automating SharePoint with Windows PowerShell**

- Exercise 1: Adding SharePoint Functionality to Windows PowerShell
- Exercise 2: Delegating the Ability to Use Windows PowerShell to Manage SharePoint
- Exercise 3: Reporting Web and Site Collection Properties
- Exercise 4: Creating Site Collections Using Windows PowerShell
- Exercise 5: Creating and Updating Items

After completing this module, students will be able to:

- Configure Central Administration
- Administer SharePoint from the Command Line
- Automate SharePoint Operations with Windows PowerShell
Module 4: Configuring Content Management

This module covers Configuring Content Management. It explains to students how to manage content (lists, libraries, items and documents).

Lessons

- Optimizing Content Storage and Access
- Managing Site Content Types and Site Columns
- Configuring the Managed Metadata Service

Lab : Lab A: Configuring List Throttling and Remote BLOB Storage

- Exercise 1: Configuring List Throttling
- Exercise 2: Enabling FILESTREAM and Provisioning the RBS Data Store
- Exercise 3: Installing RBS on All SharePoint Web and Application Servers
- Exercise 4: Configuring the BLOB Size Threshold for RBS

Lab : Lab B: Configuring Managed Metadata

- Exercise 1: Configuring and Implementing Managed Metadata

After completing this module, students will be able to:

- Optimize Content Storage and Access
- Manage Site Content Types and Site Columns
- Configure the Managed Metadata Service

Module 5: Configuring Authentication

This module describes the process of how to administer authentication to SharePoint Web applications.

Lessons

- Understanding Classic SharePoint Authentication Providers
- Understanding Federated Authentication

Lab : Lab A: Configuring Custom Authentication

- Exercise 1: Creating and Configuring an ASP.NET Membership Database
- Exercise 2: Creating a Web Application that Uses Claims-Based Authentication

Lab : Lab B: Configuring Secure Store

- Exercise 1: Creating User Accounts for Access to External Data
- Exercise 2: Configuring Secure Store Services
- Exercise 3: Configuring Secure Store Unattended Accounts
After completing this module, students will be able to:

- Describe Microsoft SharePoint Server 2010 authentication.
- Describe SharePoint Server 2010 federated authentication.

**Module 6: Securing Content**
This module details how to manage security of SharePoint content within a Web application. **Lessons**

- Administering SharePoint Groups
- Implementing SharePoint Roles and Role Assignments
- Securing and Auditing SharePoint Content
- Configuring Security for SharePoint Content

**Lab: Configuring Security for SharePoint Content**

- Exercise 1: Managing SharePoint Groups
- Exercise 2: Creating Custom Permission Levels
- Exercise 3: Managing Permissions and Inheritance
- Exercise 4: Creating a Web Application Policy

After completing this module, students will be able to:

- Administer SharePoint Groups
- Implement SharePoint Roles and Role Assignments
- Secure and Auditing SharePoint Content
- Configure Security for SharePoint Content

**Module 7: Managing SharePoint Customizations**
This module enables students to manage customizations to the SharePoint environment. **Lessons**

- Customizing Microsoft SharePoint
- Deploying and Managing Features and Solutions
- Configuring Sandboxed Solutions

**Lab: Lab A: Administering Features and Solutions**

- Exercise 1: Administering Features
- Exercise 2: Administering Solutions

**Lab: Lab B: Administering Sandboxed Solutions**

- Exercise 1: Administering SandBoxed Solutions
• Exercise 2: Modifying SandBoxed Solutions Timer Jobs
• Exercise 3: Configuring Sandbox Points

After completing this module, students will be able to:

• Customize SharePoint installations to suit your organizational needs.
• Deploy and manage SharePoint features and solutions.
• Configure sandboxed solutions.

**Module 8: Configuring and Securing SharePoint Services and Service Applications** This module shows students how to manage the SharePoint service as a whole, as well as individual services and service applications. **Lessons**

• Securing the Enterprise SharePoint Service
• Securing and Isolating Web Applications
• Services and Service Applications

**Lab : Lab A: Administering SharePoint Services**

• Exercise 1: Administering SharePoint Services
• Exercise 2: Administering SharePoint Windows Services

**Lab : Lab B: Configuring Application Security**

• Exercise 1: Configuring Web Application and Application Pool Security
• Exercise 2: Configuring Secure Sockets Layer Security

**Lab : Lab C: Configuring Service Applications**

• Exercise 1: Creating a Service Application

After completing this module, students will be able to:

• Secure your enterprise-level SharePoint service.
• Secure Web applications.
• Configure SharePoint services and service applications.

**Module 9: User Profiles and Social Networking** This module describes how to manage user profiles, My Sites, and social content. **Lessons**

• Configuring User Profiles
• Implementing SharePoint 2010 Social Networking Features
Lab : Lab A: Configuring User Profiles

- Exercise 1: Creating a User Profile Service Application
- Exercise 2: Configuring User Profiles
- Exercise 3: Configuring Profile Import from External Data Sources

Lab : Lab B: Administering My Sites

- Exercise 1: Configuring My Sites
- Exercise 2: Creating Your My Site and Profile
- Exercise 3: Configuring Social Networking Features

After completing this module, students will be able to:

- Configure user profiles.
- Implement SharePoint 2010 social networking features.

Module 10: Administering and Configuring SharePoint Search

This module discusses how to administer and configure SharePoint Search.

Lessons

- Configuring Search
- Refining Search

Lab : Lab A: Configuring Search

- Exercise 1: Creating Content for Search
- Exercise 2: Creating an Enterprise Search Center Site
- Exercise 3: Creating and Configuring a Content Source
- Exercise 4: Configuring File Types
- Exercise 5: Configuring Search Settings
- Exercise 6: Configuring Managed Properties
- Exercise 7: Creating and Configuring a Search Scope

Lab : Lab B: Tuning SharePoint Search

- Exercise 1: Creating Keywords and Best Bets
- Exercise 2: Configuring a Thesaurus
- Exercise 3: Configuring Noise Words

After completing this module, students will be able to:

- Configure the search features of SharePoint Server 2010.
• Refine searches in SharePoint 2010.

**Module 11: Implementing Productivity Service Applications** This module enables students to configure specific service applications. **Lessons**

• Implementing Business Connectivity Services
• Configuring Excel Services
• Understanding PerformancePoint Services
• Implementing InfoPath Forms Services
• Implementing Visio Services Features
• Implementing Access Services
• Implementing Office Web Apps

**Lab: Implementing Office Web Apps**

• Exercise 1: Installing and Configuring Office Web Apps
• Exercise 2: Configuring and Testing the Office Web Apps in a Document Library

After completing this module, students will be able to:

• Describe business connectivity services.
• Configure Excel services.
• Describe PerformancePoint Services.
• Configure InfoPath services.
• Implement Visio services.
• Implement Access services.
• Install Office Web Apps.

**Module 12: Installing and Upgrading to SharePoint 2010** This module teaches students how to install and upgrade to SharePoint 2010 in a variety of scenarios, and to keep SharePoint 2010 current. **Lessons**

• Installing SharePoint Servers and Farms
• Upgrading to SharePoint 2010
• Evaluating Installations and Upgrades
• Configuring SharePoint Operational Settings
• Updating SharePoint

**Lab: Lab A: Preparing SharePoint 2007 for Upgrade to SharePoint 2010**

• Exercise 1: Performing SQL Server Database Maintenance
• Exercise 2: Moving a Site Collection Between Content Databases
Exercise 3: Preparing SQL Server Databases for Upgrade
Exercise 4: Preparing SharePoint 2007 for Upgrade

**Lab : Lab B: Upgrading SharePoint 2007 to SharePoint 2010**

- Exercise 1: Upgrading SharePoint 2007 to SharePoint 2010
- Exercise 2: Upgrading Content Databases
- Exercise 3: Implementing a Visual Upgrade

After completing this module, students will be able to:

- Install SharePoint servers and farms.
- Upgrade SharePoint 2007 to SharePoint 2010.
- Plan SharePoint installations and upgrades.
- Configure operational settings in SharePoint 2010.
- Update SharePoint.

**Module 13: Implementing Business Continuity**

This module enables students to configure business continuity for SharePoint.

**Lessons**

- Protecting and Recovering Content
- Working with Backup and Restore for Disaster Recovery
- Implementing High Availability Solutions

**Lab : Lab A: Implementing a Backup Strategy**

- Exercise 1: Backing Up SharePoint Using Central Administration
- Exercise 2: Investigating SharePoint Backup Logs and Files
- Exercise 3: Automating SharePoint Backup Using Windows PowerShell

**Lab : Lab B: Implementing a Restore Strategy**

- Exercise 1: Restoring a Web Application Using Central Administration
- Exercise 2: Investigating SharePoint Restore Logs and Files
- Exercise 3: Performing a Partial Restore

After completing this module, students will be able to:

- Describe how to protect content and recover content.
- Perform backup and restore operations to mitigate against disasters.
• Implement high availability solutions with SharePoint Server.

**Module 14: Monitoring and Optimizing SharePoint Performance**

This module shows students how to monitor SharePoint performance, health, and usage, and to identify and remediate performance and health problems.

**Lessons**

• Monitoring Logs
• Configuring SharePoint Health Analyzer
• Configuring Usage Reports and Web Analytics
• Monitoring and Optimizing SharePoint Performance

**Lab : Lab A: Configuring SharePoint Monitoring**

• Exercise 1: Configuring SharePoint Diagnostic Logging

**Lab : Lab B: Analyzing SharePoint Health**

• Exercise 1: Configuring Health Analyzer Rules
• Exercise 2: Reviewing and Repairing Health Analyzer Problems

**Lab : Lab C: Reporting SharePoint Usage**

• Exercise 1: Configuring SharePoint Usage Data Collection
• Exercise 2: Creating Reports from the Logging Database

After completing this module, students will be able to:

• Use monitoring logs to establish a baseline for performance monitoring.
• Configure SharePoint Health Analyzer.
• Configure both usage reports and Web analytics.
• Monitor your SharePoint servers’ performance and optimize them.

**Module 15: SharePoint Online and Office 365**

This module covers implementing and administering Office 365 and SharePoint Online.

**Lessons**

• Introducing Office 365 and SharePoint Online
• Setting Up Office 365
• Administering SharePoint Online

After completing this module, students will be able to:
• Describe the components of Office 365 and compare the functionality of SharePoint Online to that of a SharePoint on-premise farm.
• Create and configure an Office 365 subscription.
• Secure SharePoint Online and integrate it with on-premise systems.
Course 20462C: Administering Microsoft SQL Server Databases

About this Course
This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2014 database. The course focuses on teaching individuals how to use SQL Server 2014 product features and tools related to maintaining a database.

Note: This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

Audience Profile
The primary audience for this course is individuals who administer and maintain SQL Server databases. These individuals perform database administration and maintenance as their primary area of responsibility, or work in environments where databases play a key role in their primary job.

The secondary audience for this course is individuals who develop applications that deliver content from SQL Server databases.

At Course Completion

- After completing this course, students will be able to:
  - Describe core database administration tasks and tools.
  - Install and configure SQL Server 2014.
  - Configure SQL Server databases and storage.
  - Plan and implement a backup strategy.
  - Restore databases from backups.
  - Import and export data.
  - Monitor SQL Server.
  - Trace SQL Server activity.
  - Manage SQL Server security.
  - Audit data access and encrypt data.
  - Perform ongoing database maintenance.
  - Automate SQL Server maintenance with SQL Server Agent Jobs.
  - Configure Database Mail, alerts and notifications.
Prerequisites

This course requires that you meet the following prerequisites:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.

Students who attend this training can meet the prerequisites by attending the following courses, or obtaining equivalent knowledge and skills:

- 20461C: Querying Microsoft SQL Server 2014

Module 1: Introduction to SQL Server 2014 Database Administration

This module introduces the Microsoft SQL Server 2014 platform. It describes the components, editions, and versions of SQL Server 2014, and the tasks that a database administrator commonly performs for a SQL Server instance.

Lessons: Database Administration Overview

- Introduction to the SQL Server Platform
- Database Management Tools and Techniques

Lab: Using SQL Server Administrative Tools

- Using SQL Server Management Studio
- Using the sqlcmd Utility
- Using Windows PowerShell with SQL Server

After completing this module, you will be able to:

- Describe the SQL Server platform.
- Describe common database administration tasks.
- Use SQL Server administration tools.

Module 2: Installing and Configuring SQL Server 2014

This module explains how to assess resource requirements for SQL Server 2014 and how to install it.

Lessons:

- Planning SQL Server Installation
- Installing SQL Server 2014
- Post-Installation Configuration

Lab: Installing SQL Server 2014

- Preparing to Install SQL Server
- Installing SQL Server
- Performing Post-Installation Configuration
After completing this module, you will be able to:
• Plan a SQL Server 2014 installation.
• Install SQL Server 2014.
• Perform post-installation configuration tasks.

Module 3: Working with Databases and Storage

This module describes how data is stored in databases, how to create databases, how to manage database files, and how to move them. Other tasks related to storage, include managing the tempdb database and using fast storage devices to extend the SQL Server buffer pool cache, and are also discussed.

Lessons: Introduction to Data Storage with SQL Server
• Managing Storage for System Databases
• Managing Storage for User Databases
• Moving Database Files
• Configuring the Buffer Pool Extension

Lab: Managing Database Storage
• Configuring tempdb Storage
• Creating Databases
• Attaching a Database

After completing this module, you will be able to:
• Describe how SQL Server stores data.
• Manage storage for system databases.
• Manage storage for user databases.
• Move database files.
• Configure the buffer pool extension.

Module 4: Planning and Implementing a Backup Strategy

In this module, you will consider how to create a backup strategy that is aligned with organizational needs, and learn how to perform the backup operations required by that strategy.

Lessons:
• Understanding SQL Server Recovery Models
• Planning a Backup Strategy
• Backing up Databases and Transaction Logs
• Using Backup Options
• Ensuring Backup Reliability

Lab:
• Backing Up SQL Server Databases
• Backing up Database
• Performing Database, Differential, and Transaction Log Backups
• Performing a Partial Backup

After completing this module, you will be able to:
• Describe how database transaction logs function, and how they affect database recovery.
• Plan a backup strategy for a SQL Server database.
• Back up databases and transactions logs.
• Perform copy-only, compressed, and encrypted backups.
• Maximize backup reliability.

Module 5: Restoring SQL Server 2014 Databases

In this module, you will see how to restore user and system databases and how to implement point-in-time recovery.

Lessons:
• Understanding the Restore Process
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• Restoring Databases
  • Advanced Restore Scenarios
  • Working with Point-in-Time Recovery

Lab: Restoring SQL Server Databases

• Restoring a Database Backup
  • Restoring Database, Differential, and Transaction Log Backups
  • Performing a Piecemeal Restore

After completing this module, you will be able to:

• Explain the restore process.
• Restore databases.
• Perform advanced restore operations.
• Perform a point-in-time recovery.

Module 6: Importing and Exporting Data

In this module, you will briefly explore tools and techniques so that you can import and export data to and from SQL Server.

Lessons

• Introduction to Transferring Data
• Importing and Exporting Table Data
• Copying or Moving a Database

Lab:

Importing and Exporting Data

• Using the SQL Server Import and Export Wizard
• Using the bcp Utility
• Using the BULK INSERT Statement
• Using the OPENROWSET Function

After completing this module, you will be able to:

• Describe tools and techniques for transferring data.
• Import and export data.
• Copy or move a database.

Module 7: Monitoring SQL Server 2014

This module explains how to use three of the most commonly used tools: Activity Monitor, dynamic management views and functions (DMVs and DMFs), and Performance Monitor.

Lessons

• Introduction to Monitoring SQL Server
• Dynamic Management Views and Functions
• Performance Monitor

Lab: Monitoring SQL Server 2014

• Collecting Baseline Metrics

After completing this module, you will be able to:

• Describe considerations for monitoring SQL Server and use Activity Monitor.
• Use dynamic management views and functions to monitor SQL Server.
• Use Performance Monitor to monitor SQL Server.

Module 8: Tracing SQL Server Activity

This module describes how to use SQL Server Profiler and SQL Trace stored procedures to capture information about SQL Server, and how to use that information to troubleshoot and optimize SQL Server workloads.
Course 20462C: Administering Microsoft SQL Server Databases

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Lessons

• Tracing SQL Server Workload Activity
• Using Traces

Lab: Tracing SQL Server Workload Activity

• Capturing a Trace in SQL Server Profiler
• Generating Database Tuning Recommendations
• Using SQL Trace

After completing this module, you will be able to:

• Trace activity in SQL Server.
• Use captured traces to test, troubleshoot, and optimize database performance.

Module 9: Managing SQL Server Security

In this module, you will be learning about the core concepts on which the SQL Server security architecture is based, and how to manage security at the server and database levels.

Lessons

• Introduction to SQL Server Security
• Managing Server-Level Security
• Managing Database-Level Principals
• Managing Database Permissions

Lab: Managing SQL Server Security

• Managing Server-Level Security
• Managing Database-Level Security
• Testing Database Access

After completing this module, you will be able to:

• Describe core security concepts in the SQL Server security architecture.
• Manage server-level security.
• Manage database-level security principals.
• Manage database permissions.

Module 10: Auditing Data Access and Encrypting Data

This module describes the available options for auditing in SQL Server, how to use and manage the SQL Server audit feature, and how to implement encryption.

Lessons

• Auditing Data Access in SQL Server
• Implementing SQL Server Audit
• Encrypting Databases

Lab: Auditing Data Access and Encrypting Data

• Implementing Auditing
• Implementing Transparent Database Encryption

After completing this module, you will be able to:

• Describe options for auditing data access.
• Implement SQL Server audit.
• Manage SQL Server audit.
• Implement Transparent Data Encryption.

Module 11: Performing Ongoing Database Maintenance

This module describes common database maintenance tasks that a DBA must perform, and
Course 20462C: Administering Microsoft SQL Server Databases

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demonstrates how to automate these tasks using maintenance plans.

Lessons

• Ensuring Database Integrity
• Maintaining Indexes
• Automating Routine Database Maintenance

Lab: Performing Ongoing Database Maintenance

• Managing Database Integrity
• Managing Index Fragmentation
• Implementing a Maintenance Plan

After completing this module, you will be able to:

• Scheduling a Job
• Configuring Job Step Security Contexts

Module 12: Automating SQL Server 2014 Management

This module describes how to use SQL Server Agent to automate jobs, how to configure security contexts for jobs, and how to implement multi-server jobs.

Lessons

• Automating SQL Server Management
• Implementing SQL Server Agent Jobs
• Managing SQL Server Agent Jobs
• Managing Job Step Security Contexts
• Managing Jobs on Multiple Servers

Lab: Automating SQL Server Management

• Creating a Job

After completing this module, you will be able to:

• Describe methods for automating SQL Server management.
• Create jobs, job step types, and schedules.
• Manage SQL Server Agent jobs.
• Configure job security contexts.
• Configure master and target servers.

Module 13: Monitoring SQL Server 2014 by Using Alerts and Notifications

This module covers the configuration of database mail, alerts, and notifications.

Lessons

• Monitoring SQL Server Errors
• Configuring Database Mail
• Configuring Operators, Alerts, and Notifications

Lab: Monitoring SQL Server by Using Alerts and Notifications

• Configuring Database Mail
• Implementing Operators and Notifications
• Implementing Alerts

After completing this module, you will be able to:

• Configure Database Mail.
• Monitor SQL Server errors.
• Configure operators, alerts, and notifications.
About this Course

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2014 database. The course focuses on teaching individuals how to use SQL Server 2014 product features and tools related to maintaining a database.

Note: This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

Audience Profile

The primary audience for this course is individuals who administer and maintain SQL Server databases. These individuals perform database administration and maintenance as their primary area of responsibility, or work in environments where databases play a key role in their primary job.

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At Course Completion

- After completing this course, students will be able to:
  - Describe core database administration tasks and tools.
  - Install and configure SQL Server 2014.
  - Configure SQL Server databases and storage.
  - Plan and implement a backup strategy.
  - Restore databases from backups.
  - Import and export data.
  - Monitor SQL Server.
  - Trace SQL Server activity.
  - Manage SQL Server security.
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Course Outline

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Lab: Using SQL Server Administrative Tools

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- Using the sqlcmd Utility
- Using Windows PowerShell with SQL Server

After completing this module, you will be able to:

- Describe the SQL Server platform.
- Describe common database administration tasks.

**Module 2: Installing and Configuring SQL Server 2014**

This module explains how to assess resource requirements for SQL Server 2014 and how to install it.

Lessons:

- Planning SQL Server Installation
- Installing SQL Server 2014
- Post-Installation Configuration

Lab: Installing SQL Server 2014

- Preparing to Install SQL Server
- Installing SQL Server
- Performing Post-Installation Configuration

After completing this module, you will be able to:

- Plan a SQL Server 2014 installation.
- Install SQL Server 2014.
- Perform post-installation configuration tasks.
Module 3: Working with Databases and Storage

This module describes how data is stored in databases, how to create databases, how to manage database files, and how to move them. Other tasks related to storage, include managing the tempdb database and using fast storage devices to extend the SQL Server buffer pool cache, and are also discussed.

Lessons: Introduction to Data Storage with SQL Server

• Managing Storage for System Databases
• Managing Storage for User Databases
• Moving Database Files
• Configuring the Buffer Pool Extension

Lab: Managing Database Storage

• Configuring tempdb Storage
• Creating Databases
• Attaching a Database

After completing this module, you will be able to:

• Describe how SQL Server stores data.
• Manage storage for system databases.
• Manage storage for user databases.
• Move database files.
• Configure the buffer pool extension.

Module 4: Planning and Implementing a Backup Strategy

In this module, you will consider how to create a backup strategy that is aligned with organizational needs, and learn how to perform the backup operations required by that strategy.

Lessons:

• Understanding SQL Server Recovery Models
• Planning a Backup Strategy
• Backing up Databases and Transaction Logs
• Using Backup Options
• Ensuring Backup Reliability

Lab:

Backing Up SQL Server Databases

• Backing up Database
• Performing Database, Differential, and Transaction Log Backups
• Performing a Partial Backup

After completing this module, you will be able to:

• Describe how database transaction logs function, and how they affect database recovery.
• Plan a backup strategy for a SQL Server database.
• Back up databases and transactions logs.
• Perform copy-only, compressed, and encrypted backups.
• Maximize backup reliability.

Module 5: Restoring SQL Server 2014 Databases

In this module, you will see how to restore user and system databases and how to implement point-in-time recovery.

Lessons:

• Understanding the Restore Process
• Restoring Databases
• Advanced Restore Scenarios
• Working with Point-in-Time Recovery
Lab: Restoring SQL Server Databases

• Restoring a Database Backup
• Restoring Database, Differential, and Transaction Log Backups
• Performing a Piecemeal Restore

After completing this module, you will be able to:

• Explain the restore process.
• Restore databases.
• Perform advanced restore operations.
• Perform a point-in-time recovery.

Module 6: Importing and Exporting Data

In this module, you will briefly explore tools and techniques so that you can import and export data to and from SQL Server.

Lessons

• Introduction to Transferring Data
• Importing and Exporting Table Data
• Copying or Moving a Database

Lab:

Importing and Exporting Data

• Using the SQL Server Import and Export Wizard
• Using the bcp Utility
• Using the BULK INSERT Statement
• Using the OPENROWSET Function

After completing this module, you will be able to:

• Describe tools and techniques for transferring data.
• Import and export data.
• Copy or move a database.

Module 7: Monitoring SQL Server 2014

This module explains how to use three of the most commonly used tools: Activity Monitor, dynamic management views and functions (DMVs and DMFs), and Performance Monitor.

Lessons

• Introduction to Monitoring SQL Server
• Dynamic Management Views and Functions
• Performance Monitor

Lab: Monitoring SQL Server 2014
• Collecting Baseline Metrics
• Monitoring a Workload

After completing this module, you will be able to:

• Describe considerations for monitoring SQL Server and use Activity Monitor.
• Use dynamic management views and functions to monitor SQL Server.
• Use Performance Monitor to monitor SQL Server.

Module 8: Tracing SQL Server Activity

This module describes how to use SQL Server Profiler and SQL Trace stored procedures to capture information about SQL Server, and how to use that information to troubleshoot and optimize SQL Server workloads.

Lessons

• Tracing SQL Server Workload Activity
• Using Traces
Lab: Tracing SQL Server Workload Activity

• Capturing a Trace in SQL Server Profiler
• Generating Database Tuning Recommendations
• Using SQL Trace

After completing this module, you will be able to:

• Trace activity in SQL Server.
• Use captured traces to test, troubleshoot, and optimize database performance.

Module 9: Managing SQL Server Security

In this module, you will be learning about the core concepts on which the SQL Server security architecture is based, and how to manage security at the server and database levels.

Lessons

• Introduction to SQL Server Security
• Managing Server-Level Security
• Managing Database-Level Principals
• Managing Database Permissions

Lab: Managing SQL Server Security

• Managing Server-Level Security
• Managing Database-Level Security
• Testing Database Access

After completing this module, you will be able to:

• Describe core security concepts in the SQL Server security architecture.
• Manage server-level security.
• Manage database-level security principals.
• Manage database permissions.

Module 10: Auditing Data Access and Encrypting Data

This module describes the available options for auditing in SQL Server, how to use and manage the SQL Server audit feature, and how to implement encryption.

Lessons

• Auditing Data Access in SQL Server
• Implementing SQL Server Audit
• Encrypting Databases

Lab: Auditing Data Access and Encrypting Data

• Implementing Auditing
• Implementing Transparent Database Encryption

After completing this module, you will be able to:

• Describe options for auditing data access.
• Implement SQL Server audit.
• Manage SQL Server audit.
• Implement Transparent Data Encryption.

Module 11: Performing Ongoing Database Maintenance

This module describes common database maintenance tasks that a DBA must perform, and demonstrates how to automate these tasks using maintenance plans.

Lessons

• Ensuring Database Integrity
• Maintaining Indexes
• Automating Routine Database Maintenance
Lab: Performing Ongoing Database Maintenance

- Managing Database Integrity
- Managing Index Fragmentation
- Implementing a Maintenance Plan

After completing this module, you will be able to:

- Ensure database integrity by using DBCC CHECKDB.
- Maintain indexes.
- Configure Database Maintenance Plans.

Module 12: Automating SQL Server 2014 Management

This module describes how to use SQL Server Agent to automate jobs, how to configure security contexts for jobs, and how to implement multi-server jobs.

Lessons

- Automating SQL Server Management
- Implementing SQL Server Agent Jobs
- Managing SQL Server Agent Jobs
- Managing Job Step Security Contexts
- Managing Jobs on Multiple Servers

Lab: Automating SQL Server Management

- Creating a Job
- Scheduling a Job
- Configuring Job Step Security Contexts

After completing this module, you will be able to:

- Describe methods for automating SQL Server management.
- Create jobs, job step types, and schedules.
- Manage SQL Server Agent jobs.
- Configure job security contexts.

Module 13: Monitoring SQL Server 2014 by Using Alerts and Notifications

This module covers the configuration of database mail, alerts, and notifications.

Lessons

- Monitoring SQL Server Errors
- Configuring Database Mail
- Configuring Operators, Alerts, and Notifications

Lab: Monitoring SQL Server by Using Alerts and Notifications

- Configuring Database Mail
- Implementing Operators and Notifications
- Implementing Alerts

After completing this module, you will be able to:

- Configure Database Mail.
- Monitor SQL Server errors.
- Configure operators, alerts, and notifications.
Developing Applications for the Java EE6 Platform Intermediate Course#: FJ-310-EES

Exams:

Length: 5 Days
Audience: Intermediate Java
Level: Intermediate
Technology: Java Technology
Type: Delivery Method: Instruction Led (Classroom)

About this Course

The Developing Applications for the Java(TM) EE Platform course provides students with the knowledge to build and deploy enterprise applications that comply with Java(TM) Platform, Enterprise Edition 6 technology standards. The enterprise components presented in this course include Enterprise JavaBeans(TM) (EJB(TM)) technology, the Java Persistence API, servlets, and JavaServer Pages(TM) (JSP(TM)) technology, JavaServer Faces(TM) (JSF(TM)), RESTful and SOAP web services, and the Java technology clients that use them.

Students gain hands-on experience through labs that build an end-to-end, distributed business application. The labs explore session EJB components, which implement the Session Facade pattern and provide a front-end to entity components using the Java Persistence API. The labs also explore message-driven EJB components, which act as Java Message Service (JMS) consumers. Students create user interfaces using servlets, JSP technology (JSP pages), and JavaServer Faces (JSF). Basic web services using SOAP and RESTful techniques will be created. Students learn how to assemble an application and how to deploy an application into an application server (Java EE platform runtime environment). Students perform the course lab exercises using NetBeans(TM) Integrated Development Environment.

Audience Profile

Sun(TM) Certified Java technology programmers who want to develop enterprise applications that conform to the Java EE platform standards.
- Students with Java Programming experience interested in broad overview of the Java EE platform.
- Students planning to pursue one or more of the Enterprise Java EE6 certification exams.

After completing this course, students will be able to:
- Describe the application model for the Java EE platform and the context for the model
- Select the correct Java EE Profile for a given application
- Develop and run an EJB technology application
- Develop basic Java Persistence API entity classes to enable database access
- Develop a web-based user interface using Servlets, JSPs, and JSF

Prerequisites

- Experience with the Java programming language
- Familiarity with object serialization
Developing Applications for the Java EE6 Platform Intermediate

- Familiarity with relational database theory and the basics of structured query language (SQL)
- Familiarity with the use of an IDE
- Suggested Prerequisites
  - Object-Oriented Analysis and Design Using UML (OO-226)
  - Java Programming Language, Java SE 6 (SL-275-SE6)

Course Outline

Survey of Java EE Technologies
- Describe the different Java platforms and versions
- Describe the needs of enterprise applications
- Introduce the Java EE APIs and services
- Certifications Paths
- Introducing Applications Servers
- Enterprise Modules

Enterprise Application Architecture
- Design Patterns
- Model View Controller
- Synchronous and Asynchronous communication
- Network Topologies and Clustering
- Layering (client,presentation,service,integration,persistence)

Web Technology Overview
- Describe the role of web components in a Java EE application
- Define the HTTP request-response model
- Compare Java servlets, JSP, and JSF
- Brief introduction to technologies not covered in detail

Developing Servlets
- Describe the servlet API
- Servlet configuration through annotations and deployment descriptors
- Use the request and response APIs
- Servlets as controllers

Developing With JavaServer Pages Technology
- Evaluate the role of JSP technology as a presentation mechanism
- Author JSP pages
- Process data received from servlets in a JSP page
- Brief introduction to the JSTL and EL

JavaServer Faces
- The JSF model explained
- Adding JSF support to web applications
- Using the JSF tag libraries
- Configuring JSF page navigation
- JSF Managed beans
- JSF Conversion, Validation, and Error Handling

EJB Overview
- EJB types: Session Beans
- EJB types: Message Driven beans
- Java Persistence API as a replacement for Entity EJBs
- Describe the role of EJBs in a Java EE application
- EJB life

Implementing EJB 3.0 Session Beans
- Compare stateless and stateful behavior
- Describe the operational characteristics of a stateless session bean
- Describe the operational characteristics of a stateful session bean
- Describe the operational characteristics of a singleton session bean
- Create session beans
- Package and deploy session beans
- Create session bean clients

The Java Persistence API
- The role of the Java Persistence API in a Java EE application
- Object Relational Mapping
- Entity class creation
- Using the EntityManager API
- The life cycle and operational characteristics of Entity components
- Persistent Units and Packaging

Implementing a Transaction Policy
- Describe transaction semantics
- Compare programmatic and declarative transaction scoping
- Use the Java Transaction API (JTA) to scope transactions programmatically
- Implement a container-managed transaction policy
- Support optimistic locking with the versioning of entity components
- Support pessimistic locking of entity components
- Using transactions with the web profile

Developing Asynchronous Java EE Applications and Messaging
- The need for asynchronous execution
- JMS technology introduction
- List the capabilities and limitations of Java EE components as messaging producers and consumers
- JMS and transactions
- JMS administration
Developing Message-Driven Beans

• Describe the properties and life cycle of message-driven beans
• Create a JMS message-driven bean

Web Service Model

• Describe the role of web services
• Web service models
• List the specifications used to make web services platform independent
• Describe the Java APIs used for XML processing and web services

Implementing Java EE Web Services with JAX-WS and JAX-RS

• Describe endpoints supported by the Java EE 6 platform

• Developing Web Services with Java
• Creating Web Service Clients with Java

Implementing a Security Policy

• Exploit container-managed security
• Define user roles and responsibilities
• Create a role-based security policy
• Use the security API
• Configure authentication in the web tier
Fundamentals of the Java Programming Language, Java SE 6

The Fundamentals of the Java Programming Language course was designed to enable students with little or no programming experience to begin to learn programming using the Java programming language. The course teaches the significance of object-oriented programming, the keywords and constructs of the Java programming language, and the steps required to create simple Java technology programs. Students taking this course can receive a solid basis in the Java programming language upon which to base continued work and training.

**Students who can benefit from this course:**

- Beginners to programming who have basic mathematical, logical, and analytical problem-solving skills and who want to begin learning the Java programming language. This includes technical writers, web developers, technical managers, and individuals with a technical, non-programming background, such as system administrators
- Novice programmers and those programmers who prefer to start learning the Java programming language at an introductory level.
- Students who wish to begin their study of the Sun Certified Java Associate (SCJA) exam

**Course Objectives:**

- Demonstrate knowledge of Java technology, the Java programming language, and the product life cycle
- Use various Java programming language constructs to create several Java technology applications
- Use decision and looping constructs and methods to dictate program flow
- Implement intermediate Java technology programming and object-oriented (OO) concepts in Java technology programs

**Course Topics:**

**Explaining Java Technology**

- Describe key concepts of the Java programming language
- List the three Java technology product groups
- Summarize each of the seven stages of the product life cycle

**Analyzing a Problem and Designing a Solution**

- Analyze a problem using object-oriented analysis
- Design classes from which objects will be created

**Developing and Testing a Java Technology Program**

- Identify the four components of a class in the Java programming language
- Use the main method in a test class to run a Java technology program from the command line
- Compile and execute a Java technology program

**Declaring, Initializing, and Using Variables**

- Identify the use the syntax for variables and define the syntax for a variable
- List the eight Java programming language primitive data types
- Declare, initialize, and use variables and constants according to Java programming language guidelines and coding standards
• Modify variable values using operators
• Use promotion and type casting

Creating and Using Objects

• Declare, instantiate, and initialize object reference variables
• Compare how object reference variables are stored in relation to primitive variables
• Use a class (the String class) included in the Java Software Developer Kit (SDK)
• Use the Java 2 Platform, Standard Edition (J2SE[TM]) class library specification to learn about other classes in this application programming interface (API)

Using Operators and Decision Constructs

• Identify relational and conditional operators
• Create if and if/else constructs
• Use the switch construct

Using Loop Constructs

• Create while loops
• Develop for loops
• Create do/while loops

Developing and Using Methods

• Describe the advantages of methods and define worker and calling methods
• Declare and invoke a method
• Compare object and static methods
• Use overloaded methods

Implementing Encapsulation and Constructors

• Use encapsulation to protect data
• Create constructors to initialize objects

Creating and Using Arrays

• Code one-dimensional arrays
• Set array values using length attribute and a loop
• Pass arguments to the main method for use in a program
• Create two-dimensional arrays

Implementing Inheritance

• Define and test your use of inheritance
• Explain abstraction
• Explicitly identify class libraries used in your code
Implementing and Maintaining Microsoft SQL Server 2008 Reporting Services

About this Course

Elements of this syllabus are subject to change.

This three-day instructor-led course teaches students how to implement a Reporting Services solution in an organization. The course discusses how to use the Reporting Services development tools to create reports, and how to use the Reporting Services management and administrative tools to manage a Reporting Services solution.

MCSA Candidate Profile

This course is intended for information technology (IT) professionals and developers who need to implement reporting solutions by using Microsoft SQL Server 2008 Reporting Services.

After the Course

After completing this course, students will be able to:

- Describe SQL Server Reporting Services and its components.
- Create a Reporting Services report.
- Enhance a Reporting Services report.
- Create and manipulate data sets.
- Use report models to implement reporting for business users.
- Configure report publishing and execution settings.
- Implement subscriptions for reports.
- Administer Reporting Services.
- Implement custom Reporting Services applications.

Course Outline

Module 1: Introduction to Microsoft SQL Server Reporting Services

The students will be introduced to the role that Reporting Services plays in an organization's reporting life cycle, the key features offered by Reporting Services, and the components that make up the Reporting Services architecture.

Lessons

- Overview of SQL Server Reporting Services
- Installing Reporting Services
- Reporting Services Tools
Lab : Introduction to Microsoft SQL Server Reporting Services
- (Level 200) Exploring Report Designer
- (Level 200) Exploring Report Manager
After completing this module, students will be able to:
- Describe the features of SQL Server Reporting Services.
- Install Reporting Services.
- Describe the Reporting Services tools.

Module 2: Authoring Basic Reports
The students will learn the fundamentals of report authoring, including configuring data sources and data sets, creating tabular reports, summarizing data, and applying basic formatting.

Lessons
- Creating a Basic Table Report
- Formatting Report Pages
- Calculating Values

Lab : Authoring Basic Reports
- (Level 200): Creating a Basic Table Report
- (Level 200): Formatting Report Pages
- (Level 200): Adding Calculated Values
After completing this module, students will be able to:
- Create a basic table report.
- Format report pages.
- Calculate values for a report.

Module 3: Enhancing Basic Reports
The students will learn about navigational controls and some additional types of data regions, and how to use them to enhance a basic report.

Lessons
- Interactive Navigation
- Displaying Data

Lab : Enhancing Basic Reports
- (Level 200) Using Dynamic Visibility
- (Level 200) Using Document Maps
- (Level 200) Initiating Actions
- (Level 200) Using a List Data Region
- (Level 200) Creating a Tablix Report
- (Level 200) Adding Chart Subreport to Parent Report
After completing this module, students will be able to:
- Create reports with interactive navigation.
- Display data in various formats.

Module 4: Manipulating Data Sets
The students will explore data sets to a greater depth, including the use of alternative data sources and interacting with a data set through the use of parameters. Students will learn how to dynamically modify the data set underlying a data region by allowing parameters to be sent to the underlying query, as well as will learn to use best practices to implement static and dynamic parameter lists when interacting with queries and stored procedures.

Lessons
- Defining Report Data
- Using Parameters and Filters
- Using Parameter Lists

**Lab: Manipulating Data Sets**
- (Level 200) Using Parameters to Restrict Query Results
- (Level 200) Using Parameters to Filter Report Data
- (Level 200) Creating Dynamic Parameter Lists
- (Level 200) Using Parameters with a Stored Procedure
- (Level 200) Displaying All Categories in a Parameter List

After completing this module, students will be able to:
- Define report data.
- Use parameters and filters.
- Use parameter lists.

**Module 5: Using Report Models**
The students will learn how to create a report model so that business users can create their own reports without using the full Report Designer development environment. Students will also learn how to use Report Builder to create a report from a report model.

**Lessons**
- Creating Report Models
- Using Report Builder

**Lab: Using Report Models**
- (Level 200) Creating a Report Model
- (Level 200) Using Report Builder to Create a Report

After completing this module, students will be able to:
- Create Report Models.
- Use Report Builder.

**Module 6: Publishing and Executing Reports**
The students will learn the various options you can use to publish reports to the report server and execute them.

**Lessons**
- Publishing Reports
- Executing Reports
- Creating Cached Instances
- Creating Snapshots and Reporthistory

**Lab: Publishing and Executing Reports**
- (Level 200) Publishing Reports
- (Level 200) Executing Reports
- (Level 200) Configuring and Viewing a Cached Report
- (Level 200) Configuring and Viewing a Snapshot Report

After completing this module, students will be able to:
- Publish reports.
- Execute reports.
- Create cached instances.
- Create snapshots and reporthistory.

**Module 7: Using Subscriptions to Distribute Reports**
The students will learn how to implement subscriptions so that you can distribute reports either automatically by e-mail or by publishing reports to a shared folder.
Lessons
- Introduction to Report Subscriptions
- Creating Report Subscriptions
- Managing Report Subscriptions

**Lab : Using Subscriptions to Distribute Reports**
- (Level 200) Creating a Standard Subscription
- (Level 200) Creating a Data-Driven Subscription

After completing this module, students will be able to:
- Describe report subscriptions.
- Create report subscriptions.
- Manage report subscriptions.

**Module 8: Administering Reporting Services**
The students will learn how to administer the Reporting Services server, how to monitor and optimize the performance of the report server, how to maintain the Reporting Services databases, and how to keep the system secure.

**Lessons**
- Reporting Server Administration
- Performance and Reliability Monitoring
- Administering Report Server Databases
- Security Administration
- Upgrading to Reporting Services 2008

**Lab : Administering Reporting Services**
- (Level 200) Using Reporting Services Configuration Manager
- (Level 200) Securing a Reporting Services Site
- (Level 200) Securing Items

After completing this module, students will be able to:
- Administer the reporting server.
- Monitor performance and reliability.
- Administer the Report Server databases.
- Administer security.
- Upgrade to Reporting Services 2008.

**Module 9: Programming Reporting Services**
The students will learn how to query Reporting Services information programmatically and how to automate report management tasks. Students will also learn how to render reports without relying on Report Manager, and how to extend the feature set of a report server by creating custom code.

**Lessons**
- Querying for Server Information Using a Web Service
- Automating Report Management
- Rendering Reports
- Creating Custom Code

**Lab : Programming Reporting Services**
- (Level 200) Using URL Access to Display a Report
- (Level 200) Building a Reporting Services Web Service Client
- (Level 200) Using the Report Viewer Control

After completing this module, students will be able to:
- Query server information using a Web service.
• Automate report management.
• Render reports.
• Create custom code.
About this Course

Learn the fundamentals and best practices of project management methodology as applied to IT initiatives, and practice and master the skills you need to deliver IT projects on time, within budget, and to specification. Examine all aspects of IT projects, including hardware, software, vendor relationships, communicating with different audiences, and working with virtual teams. Learn to determine project scope through effective requirements identification, set and manage stakeholder expectations, identify and manage IT risks, and meet quality standards. Learn how to overcome the most common pitfalls of IT project success.

Audience Profile

IT professionals, IT project managers, IT managers, IT project team members, associate project managers, project managers, project coordinators, project analysts, project leaders, senior project managers, team leaders, product managers, and program managers.

At Course Completion

Upon successful completion of this course, students will be able to:

- Identify Quality Requirements
- Identify the Stakeholders
- Complete the Project Charter
- Trace Requirements
- Determine the Work Breakdown Structure
- Break Down the Work into Activities
- Sequence the Activities
- Estimate Activity Duration
- Use Network Diagramming
- Identify Resource Requirements
- Create a Responsibility Assignment Matrix
- Develop a Project Cost Estimate
- Create a Communication Management Plan
- Assess Project Risks
- Determine Risk Response Strategies
- Manage a Vendor Driven Change
- Develop a Change Management Plan
IT Project Management
PM1203

COURSE OUTLINE

Prerequisites
If you have previously taken Project Management Fundamentals, you should not take this course, as there is significant content overlap.

Course Outline

1. IT Project Foundations
   - IT Project Success and Failure
   - Practical Project Methodologies
   - Software Development Methodologies and Processes
   - Definition of a Project
   - Project Management as a Service Industry
   - Formal vs. Informal Management
   - Complexity and Uncertainty in Projects
   - Influences of Organizational Structure on Project Management
   - Project Management Institute (PMI®)
   - Project Management Life Cycle
   - Project Management as a Subset of Overall Management Skills
   - Iterative Nature of the Project Management Life Cycle

2. Quality in IT Projects
   - Quality Management
   - IT Project Testing

3. Project Initiation
   - Activities of Project Initiation

4. Project Scope Definition
   - Scope
   - Defining and Gathering Requirements
   - Tracing
   - Work Breakdown Structure

5. Time Management and Scheduling
   - Time Decomposition
   - Network Diagramming

6. Resource Planning
   - Identification of Required Project Resources
   - Roles and Responsibilities Chart
   - Staffing Management Plan
   - Resource Constraints
   - Responsibility Assignment Matrix

7. Cost Management and Control
   - Cost Planning and Analysis
   - Cost Estimating Techniques
   - Levels of Accuracy in Estimates
   - Cost Estimates at Planning Milestones
   - Contingency and Management Reserves
8. Communications Management

- Management of Stakeholder Expectations
- Considerations for Effective Communication
- Lines of Communication
- Forms of Communication
- Communication Management Plan
- Project Status Report

9. Risk Management

- Essentials of Project Risk Management
- Risk Sources for the IT Project
- Stakeholder Risk Tolerance
- Risk Identification Techniques
- Risk Ranking
- Risk Triggers
- Risk Response Strategies

10. Vendor Management

- Procurement and Sourcing Management
- Overview of Vendor Management
- Vendor Management Success
- Measures of Vendor Management Success

11. Change Management

- Project Changes
- Integrated Change Control
- Change Control Process

12. Phase and Project Closure

- Phase and Project Closing
- Lessons Learned
- Phase and Project Reports
# ITIL Intermediate Continual Service Improvement

**About this Course**

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Continual Service Improvement stage of the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Continual Service Improvement certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

**Prerequisite**

ITIL Foundation

**Target Audience**

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Continual Service Improvement phase of the ITIL Lifecycle as well as the processes, functions and activities required to apply them.

**At Course Completion**

At the end of this course, you will learn:

- The purpose and objectives of Continual Service Improvement
- How Continual Service Improvement integrates with the stages in the Lifecycle
- How Continual Service Improvement depends upon an understanding of change within an organization
- The nature of the activities and the skills required for the 7 step improvement process
- How tools can assist some or all of the activities in the Continual Service Improvement process
- The effects on an organization of the challenges facing Continual Service Improvement

## Course Outline

### 1. COURSE INTRODUCTION

- Purpose and objectives of Continual Service Improvement
- Scope of Continual Service Improvement
- Approach to Continual Service Improvement
- Interfaces with other ITIL Lifecycle stages

### 2. PRINCIPLES

- How the success of CSI depends upon an understanding of change upon an organization
- How CSI drives the adoption of, and is influenced by, Service Level Management
- How the Deming Cycle is critical to both the implementation and application of CSI
- Effective use of the various aspects of Service Measurement
- Knowledge Management and improvement initiatives
• CSI and good governance where goals are aligned and good management is achieved.
• How frameworks, models, standards and quality systems fully support the concepts embodied in CSI

3. PROCESSES

• The 7-step improvement process.
• How CSI integrates with the other stages in the Service Lifecycle
• Service Reporting and articulate reporting policies and rules
• Service Measurement
• The importance of properly defining metrics and measurements
• The concept of Return on Investment for CSI and how to create a return on investment, establish a business case and measure the benefits achieved
• The various Business questions for CSI
• The relationship between CSI and Service Level Management

4. METHODS AND TECHNIQUES

• What to assess and when
• Using gap analysis to identify areas with room for improvement
• Benchmarking
• Measuring and Reporting frameworks such as the BSC and SWOT analysis
• The Deming Cycle
• The relationships and interfaces with other service management processes
• Effective use of availability management techniques by CSI
• Effective use of capacity management techniques by CSI
• ITSCM requirements and using Risk Management to identify areas for improvement
• Support from Problem management

5. ORGANIZATION

• The nature of the activities and the skills required for the 7-step improvement process
• The responsibilities, skills and competencies for Service Manager, CSI Manager, and Service Owner
• How authority matrices (RACI) can very used when defining communication procedures in the CSI process

6. TECHNOLOGY CONSIDERATIONS

• How the following tools can be used to assist some or all of the activities of the Continual Service Improvement process
• IT service management suites
• System and network management
• Event management
• Automated Incident/Problem resolution
• Performance Management
• Statistical Analysis tools
• Project and Portfolio Management
• Financial management
• Business Intelligence reporting

7. IMPLEMENTATION AND IMPROVEMENT
• Where to start
• The role of Governance to CSI
• The effect of Organizational Change for CSI
• A Communications strategy and Plan

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

• The effects on an organization of the challenges facing Continual Service Improvement
• The appropriate critical success factors for Continual Service Improvement
• The potential impact if the risks associated with implementing CSI
• The potential value to business, benefits and costs

9. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL: Managing Across the Lifecycle (MALC)

About this Course

The ITIL MALC (Managing Across the Lifecycle) course offers candidates the ability to achieve the ITIL Expert certification upon passing the ITIL Managing Across the Lifecycle exam. The course prepares candidates to take the ITIL Managing Across the Lifecycle Intermediate exam as well as providing valuable knowledge that can be implemented in the workplace. This certification completes the ITIL Intermediate Lifecycle and Capability streams by focusing on the knowledge required to implement and manage the necessary skills associated with the use of the Service Lifecycle.

Prerequisite

An ITIL Foundation certificate and a minimum of 15 credits earned through the formal Service Lifecycle stream or Service Capability stream qualifications.

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a deeper knowledge of, or who are involved in managing services across the different lifecycle phases.

At Course Completion

At the end of this course, you will learn:

- Managing the planning and Implementation of IT Service Management
- Lifecycle positioning and transition
- How to achieve business value with people, process and function
- Challenges, Critical Success Factors and risks to service management
- Risk Management
- Lifecycle project assessment
- Management of strategic change
- Understanding complementary industry guidance

Course Outline

1. COURSE INTRODUCTION

- Lifecycle positioning and transition
- The difference between open-loop and closed-loop systems
- Complex Monitor Control loops
- ITSM Monitor Control loops
- Relationship between Business and IT
• How to achieve business value with people, process and function
• How to achieve business value with supplier relationship and technology alignment

2. MANAGEMENT OF STRATEGIC CHANGE (MOC)

• Value creation challenge
• Critical success components to managing lifecycle risk
• Business benefits
• Determining Benefit Realization
• Determining Value to Business VOI, ROI
• Determining Variable Cost Dynamics (VCD)
• Alignment of business policy, future direction and Demand Management
• Alignment to service portfolio and service catalogue management
• Planning and Defining scope
• Awareness of design and delivery model choices
• Budgeting, costing, service assets
• Intangible and Measuring benefits
• Assets- Service and Strategic influencing
• Defining awareness communication activities
• People Education and knowledge transfer management
• Business Relationship Management
• Service Structure and Value nets and value-chains
• Termination and Retirement of Services

3. RISK MANAGEMENT

• Challenges, Critical Success Factors and risks to service management
• Identification of Risk
• Evaluation of Risk – CFIA, FTA, BIA, SFA, Risk Analysis and Management
• Corrective Actions
• Controlling Risk
• Transfer of risks
• Service Provider risks
• Contract risks
• Design risks
• Operational risks
• Market risks

4. PLANNING AND IMPLEMENTING

• Activities during Plan, Do, Check, Act including Aspects of Strategy and the 4P’s of Strategy
• Policy considerations
• Strategy considerations
• Design considerations
• Transition considerations
• Directing
• Value of achieving business goals by guiding, leading and monitoring
• Controlling and Evaluating
• Value of verifying and using feedback to control lifecycle
• Organizational Form and Design
• Communication, Coordination and Control

5. UNDERSTANDING ORGANIZATIONAL CHALLENGES

• Organizational maturity
• Organizational structure
• Knowledge management and security of information
• Organizational transition
• Governance
• Balance in Service Operations

6. SERVICE ASSESSMENT

• Value of Measuring
• Why Measure
• What to Measure
• Value of Monitoring
• What to Monitor
• Reporting
• Service Portfolio assessment across the lifecycle
• Assessment of achievements
• Corrective action
• Business Perspective and Improvements

7. UNDERSTANDING COMPLEMENTARY INDUSTRY GUIDANCE AND TOOL STRATEGIES

• COBIT
• ISO/IEC 20000
• CMMI
• Balanced Scorecard
• Quality Management
• OSI Framework
• Annuity
• Service Management maturity framework
• Six Sigma
• Project Management
• TQM
• Management Governance framework

8. EXAM PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Planning, Protection & Optimization

About this Course

Participants will learn the principles and core elements of the Service Capability approach to IT Service Management as well as focusing on the processes & roles, activities and their execution throughout the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Planning, Protection & Optimization certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

IT Managers, Operational staff, and anyone requiring a deeper knowledge of or who are involved in Planning, Protection & Optimization cluster of processes and functions.

At Course Completion

At the end of this course, you will learn:

• The concept of Service Management as a practice
• The functions & processes across the Lifecycle
• The purpose, goal and objectives of Availability Management
• The purpose, goal and objectives of Capacity Management
• The purpose, goal and objectives of IT Service Continuity Management
• The purpose, goal and objectives of Information Security Management
• The purpose, goal and objectives of Demand Management
• Technology Implementation considerations

Course Outline

1. COURSE INTRODUCTION

• Introduction/Housekeeping
• Service Management as a practice
• Service, its value proposition and composition
• Functions and processes across the lifecycle
• The role of processes in the Service Lifecycle
• How Service Management creates business value
• How Planning, Protection and Optimization supports the
• Service Lifecycle
2. CAPACITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Capacity Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Capacity Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Capacity Management

3. AVAILABILITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Availability Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Availability Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Availability Management

4. IT SERVICE CONTINUITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of ITSCM as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable ITSCM and how each particular Stage relates to Planning, Protection and Optimization
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful ITSCM

5. INFORMATION SECURITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Information Security Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Information Security Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Information Security Management

6. DEMAND MANAGEMENT

- Basic concepts of Demand Management
- Activity based Demand Management and business activity patterns
- Interfaces to Service Design
- Managing demand for Services
- Activities, methods and techniques that enable this process and how they relate to Planning, Protection and Optimization

7. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

- Challenges, Critical Success Factors and risks related to Capacity & Demand Management
• Challenges, Critical Success Factors and risks related to Availability Management
• Challenges, Critical Success Factors and risks related to ITSCM
• Challenges, Critical Success Factors and risks related to Information Security Management
• Challenges, Critical Success Factors and risks directly associated with the Service Design phase of the Service Lifecycle and how it relates specifically to PPO

8. ROLES AND RESPONSIBILITIES

• Capacity Management process
• Availability Management process
• IT Service Continuity Management process
• Information Security Management process

9. TECHNOLOGY AND IMPLEMENTATION CONSIDERATIONS

• Requirements for technology to assist Service Design
• Evaluation criteria for technology and tooling for process implementation
• Practices for practice and process implementation
• Challenges, Critical Success Factors and risks related to implementing practices and processes

10. Exam PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Release Control & Validation

About this Course

Participants will learn the principles and core elements of the Service Capability approach to IT Service Management as well as focusing on the processes & roles, activities and their execution throughout the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Release, Control & Validation certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

IT Managers, Operational staff, and anyone requiring a deeper knowledge of or who are involved in the Release, Control & Validation cluster of processes and functions.

At Course Completion

At the end of this course, you will learn:

- The concept of Service Management as a practice
- The purpose, goal and objectives of the Change Management Process
- The purpose of the SACM process and the goal of Configuration Management
- The use of a Configuration Management System (CMS), and its major components, in supporting the effective execution of SACM process
- The purpose, goal, objectives and scope of the RDM process
- The purpose, goal and objectives of the SVT process
- The purpose, goal, objectives and scope of the KM process
- The purpose, goal, objectives and scope of the Service Evaluation process
- The purpose and scope of the Request Fulfillment process

Course Outline

1. COURSE INTRODUCTION

- Introduction/Housekeeping
- Service Management as a practice
- Service, its value proposition and composition
- Functions and processes across the lifecycle
- The role of processes in the Service Lifecycle
• How Service Management creates business value
• How Release Control and Validation supports the Service Lifecycle

2. CHANGE MANAGEMENT
• Purpose, goal, objectives & scope
• Value to business and to the Service Lifecycle
• Policies, principles and basic concepts
• Types of Change Requests
• Triggers, inputs, outputs and interfaces with other processes
• How to measure effectively, metrics and their applications
• Activities and the Service Operation Lifecycle stage
• The relationship between Continual Service Improvement and organizational change

3. SERVICE ASSET AND CONFIGURATION MANAGEMENT
• Purpose, goal and objectives & scope
• Value to business and to the Service Lifecycle
• Policies, principles and basic concepts
• The use of a Configuration Management System (CMS)
• Process activities, tools and deliverables
• The considerations for retaining CMS back-up and historical data for business purposes
• How to measure effectively, metrics and their application
• Activities and the Service Operation Lifecycle stage

4. RELEASE AND DEPLOYMENT MANAGEMENT
• Purpose, goal and objectives & scope
• Release Unit, Release Design options and considerations
• Release and Deployment planning
• Developing the detailed implementation plan for release deployment
• Support after deploying the new Release
• Triggers, inputs and outputs and interfaces with other processes
• Information recording and maintenance
• Challenges, risks and Critical Success Factors

5. SERVICE VALIDATION AND TESTING
• Purpose, goal and objectives & scope
• Value to business and Service Lifecycle
• Policies and principles
• Validation and Testing perspectives, purposes and stakeholder requirements
• Test levels and test models to help with building quality services deliverables
• Process activities, methods and techniques and how they relate to the Service Lifecycle
• Triggers, inputs and outputs and the process interfaces
• Maintaining test data and test environments in respect of changing test requirements
• Measurement and Metrics

6. KNOWLEDGE MANAGEMENT
• Purpose, goal and objectives & scope
• Value to the business and to the Service Lifecycle
• Policies, principles and the request model concept
• Basic layers of the KM concept using the DIKW structure
• What constitutes an effective KM strategy, and practical techniques for enabling knowledge transfer
• Stakeholder groups within the IT Service Management organization whose support is needed for effective Knowledge Management
• Measuring the value contribution of KM, and practical metrics

7. SERVICE EVALUATION

• Purpose, goal and objectives
• Scope
• Service Evaluation process terminology and workflow
• Intended effect and unintended effects of a change, and factors for evaluating the effectiveness of a Service Design and changes
• Evaluation of service performance to Risk Management and the potential impact on the course of actions for the overall Service Design/change evaluation
• Challenges pertaining to Service Evaluation

8. REQUEST FULFILLMENT

• Purpose, goal and objectives
• Scope
• How Request Fulfillment may help to establish a self-help service practice within an organization.
• The difference between Request Fulfillment and Incident Management
• The relationship between Request Fulfillment and Release Management, and how they interact with SACM
• Challenges, risk and Critical Success Factors

9. ROLES AND RESPONSIBILITIES

• Change Management
• Service Asset and Configuration Management
• Service Validation and Testing
• Release and Deployment Management
• Request Fulfillment
• Service Performance and Risk Evaluation activities
• Service Knowledge Management

10. TECHNOLOGY AND IMPLEMENTATION CONSIDERATIONS

• Requirements for ITSM technology for implementing processes
• Evaluation criteria for technology and tools for process implementation
• Challenges, Critical Success Factors and risks
• How to plan and implement Service Management technologies
• Technology considerations for implementing collaboration for process execution, Configuration Management and Knowledge Management
• The Deming Cycle
ITIL Intermediate Service Design

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Design stage of the Service Lifecycle. This lifecycle stage focuses on enabling Service Delivery by designing services in-line with the Service Strategy. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Design certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Service Design phase of the Lifecycle and the affected processes, functions and activities and their application.

At Course Completion

At the end of this course, you will learn:

- Service Design principles and service composition
- Activities and techniques within Requirements Engineering
- Functional roles analysis and use of the RACI matrix
- The types of tools that would benefit Service Design
- Activities and techniques associated with Application Management
- Designing supporting systems, especially the Service Portfolio
- Business Service Management (BSM) and Service Oriented Architecture (SOA) principles

Course Outline

1. COURSE INTRODUCTION

- The concept of Service Management as a practice
- The concept of Service, its value proposition and composition
- The concepts of Function, Process and Role The purpose, goals and objectives of Service Design
- The scope of Service Design
- Business value
- The contents and use of the Service Design Package
- The contents and use of Service Acceptance Criteria

2. PRINCIPLES

- Service Design principles and service composition
• The importance and approach to balanced design
• Service requirements, business requirements and drivers
• Design activities and constraints
• The principles and the five aspects of Service Design:
  • Design aspects
  • Designing service solutions
  • Designing supporting systems, especially the Service Portfolio
  • Designing technology architectures
  • Designing processes
  • Designing measurement systems and metrics
• Business Service Management (BSM) and Service Oriented Architecture (SOA) principles
• Service Design models

3. PROCESSES

• The activities and techniques, but not the detailed process steps, for the following processes:
  • Service Catalog Management
  • Service Level Management
  • Capacity Management
  • Availability Management
  • IT Service Continuity Management
  • Information Security Management
  • Supplier Management
  • Design Coordination
• The five aspects of Service Design as they relate to the management of Service Design processes

4. TECHNOLOGY RELATED ACTIVITIES

• Activities and techniques within Requirements Engineering
• Activities and techniques within Data and Information Management
• Activities and techniques associated with Application Management

5. ORGANIZING FOR SERVICE DESIGN

• Functional roles analysis and use of the RACI matrix
• The roles and responsibilities within Service Design

6. TECHNOLOGY CONSIDERATIONS

• The types of tools that would benefit Service Design
• Requirements for Service Management tools

7. IMPLEMENTATION AND IMPROVEMENT

• The Service Design issues relating to:
  • Business Impact Analysis
  • Service Level Requirements Risks
  • The six-stage implementation approach
• Measurements through Critical Success Factors and Key Performance Indicators
• Prerequisites for success and risks affecting Service Design activities and processes

8. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL Intermediate Service Operation

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Operation stage of the Service Lifecycle. This lifecycle stage focuses on organizing and maintaining the day-to-day Service Operation. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Operation certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisites

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers and ITSM trainers who require a detailed understanding of the ITIL Service Operation phase of the ITIL core Lifecycle and the affected processes, functions and activities and their application

At Course Completion

At the end of this course, you will learn:

- The term "Service Operation", and how it fits in the overall core ITIL Lifecycle
- The operational activities of processes covered in other Lifecycle phases
- Service Operation Processes
- Organizational issues including: Functions, Groups, Teams, Department and Divisions
- Service Operation Activities
- Service Operation Technology Considerations and Requirements
- Planning and Implementing Service Management Technologies
- Managing Change in Service Operations
- Challenges, Critical Success Factors and Risks

Course Outline

1. COURSE INTRODUCTION

- The term "Service Operation", and how it fits in the overall core ITIL Lifecycle
- The main purpose and objectives of Service Operation
- The ITIL processes primarily covered in Service Operation
- The functions within Service Operation
- The value to the business
2. PRINCIPLES

- Organizational issues including: Functions, Groups, Teams, Department and Divisions
- Achieving balance in Service Operations
- Providing Service
- Involvement in Design and Transition
- Operational Health
- Communication
- Documentation

3. PROCESSES

- Event Management
- Incident Management
- Request Fulfillment
- Problem Management
- Access Management
- The operational activities of processes covered in other Lifecycle phases
- Change Management
- Configuration Management
- Release Management
- Capacity Management
- Availability Management
- Knowledge Management
- Financial Management
- IT Service Continuity Management

4. ACTIVITIES

- Monitoring and Control
- IT Operations
- Mainframe Management
- Server Management and Support
- Network Management
- Storage and Archive
- Database Management
- Directory Services Management
- Desktop Support
- Middleware Management
- Internet/Web Management
- Facilities and Data Center Management
- IT Security Management in relation to Service Operation
- Improvement of Operational Activities

5. ORGANIZATION

- Functions
- Service Desk
- Technical Management
- IT Operations Management
- Application Management
• Roles and Responsibilities
• Service Operation Organizational Structures

6. TECHNOLOGY CONSIDERATIONS

• Generic Requirements
• Event Management
• Incident Management
• Request Fulfillment
• Problem Management
• Access Management
• Service Desk

7. IMPLEMENTATION AND IMPROVEMENT

• Managing Change in Service Operations
• Service Operation and Project Management
• Assessing and Managing Risk in Service Operations
• Operational Staff in Design and Transition
• Planning and Implementing Service Management Technologies

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

• Challenges, Critical Success Factors and Risks

9. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL Intermediate Service Strategy

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Strategy stage of the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Strategy certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers involved in the ongoing management, coordination and integration of strategizing activities within the Service Lifecycle.

At Course Completion

At the end of this course, you will learn:

- The logic of value-creation within the context of the ITIL Service Lifecycle
- Strategic assets of an organization and their performance potential for serving particular customers or market spaces (internal or external)
- Formal definitions of services suitable for planning and execution across the Service Lifecycle
- Service valuation, demand modeling, service provisioning and analysis, and business impact analysis
- Service Portfolio Management, methods, and processes related to service management and services
- High-level strategies for demand management that can be supported by capabilities across the Service Lifecycle
- How Service Strategy is driven through and informed by other elements of the Service Lifecycle

Course Outline

1. INTRODUCTION TO SERVICE STRATEGY

Objectives

- Full understanding of service strategy terms and core concepts.
- The purpose, goals and objectives of service strategy
- The scope of service strategy
- The value to the business
- The context of service strategy in relation to all other lifecycle stages.

2. SERVICE STRATEGY PRINCIPLES
Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to decide on a service strategy
- How to utilize the four P's of service strategy
- How to define services, create value and leverage the combined use of utility and warranty
- How to use service economics and sourcing strategies when meeting business outcomes.

3. SERVICE STRATEGY PROCESSES

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The management level concepts for the five service strategy processes and how they flow and integrate with the lifecycle
- The purpose, scope and objectives of each service strategy process and how they link to value for the business.

4. GOVERNANCE

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to analyze IT governance and use it to set strategy by leveraging governance frameworks, bodies.

5. ORGANIZING FOR SERVICE STRATEGY

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to create an organizational design using the relevant development and departmental methods.

6. TECHNOLOGY CONSIDERATIONS

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- Understand the relevance and opportunities for service automation and the importance and application of technology interfaces across the lifecycle.

7. IMPLEMENTING SERVICE STRATEGY

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- Develop implementation strategies that follow a lifecycle approach (e.g. design, transition, operation and improvement, programs).

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
• The ability to provide insight and guidance for strategic challenges, risks and critical success factors.

9. EXAM PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Service Transition

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Transition stage of the Service Lifecycle. This lifecycle stage focuses on putting services into operation without disruptions to the business. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Transition certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Service Transition phase of the ITIL core Lifecycle and the affected processes, functions and activities and their application.

At Course Completion

At the end of this course, you will learn:

• Service Transition principles
• Change Management within Service Transition
• Implementation and Improvement concepts
• Service Transition Activities and Processes
• Designing supporting systems, especially the Service Portfolio
• Technology Considerations
• Management of Cultural change, risks and value

Course Outline

1. COURSE INTRODUCTION

• The term "Service Transition", and how it fits in the overall core ITIL Lifecycle
• The main purpose and objectives of Service Transition
• The ITIL processes primarily covered in Service
• Transition
• The functions within Service Transition
• The value to the business
2. PRINCIPLES

- Define and implement a formal policy
- Implement all changes to services
- Adopt a common framework and standards
- Maximize re-use of established processes and systems
- Align Service Transition plans with the business needs
- Maintain relationship with stakeholders
- Provide systems for knowledge transfer and decision support
- Assuring the quality of new or changed services
- Plan release and deployment packages
- Proactively improve quality

3. PROCESSES

- Transition planning and Support
- Change Management
- Service Asset and Configuration Management
- Release and Deployment Management
- Service Valuation and Testing
- Change Evaluation
- Knowledge Management

4. ACTIVITIES

- Communication
- Organizational Change
- Organizational Change Products
- Planning/ Implementing Change
- Resistance to Change
- Stakeholder Management

5. ORGANIZATION

- Change Management
- Service Asset and Configuration Management
- Service Validation and Testing
- Release and Deployment
- Request Fulfillment
- Service Performance and Risk Evaluation
- Service Knowledge Management

6. TECHNOLOGY CONSIDERATIONS

- Service Transition support tools
- ITSM Technology
- Knowledge Management tools
- Collaboration - Communities and Workflow Management
- Configuration Management System (CMS)
7. IMPLEMENTATION AND IMPROVEMENT

- Justifying Service Transition
- Designing Service Transition
- Introducing Service Transition
- Cultural Change
- Risks and Value
- Implementing Challenges, CSFs and Risks
- Service Transition under difficult circumstances

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

- Challenges, Critical Success Factors and Risks

9. EXAM PREPARATION

- Sample Exams
- Feedback
- Recap
ITIL® V3 Awareness Course

Course Description:
The 1 day ITIL® V3 Awareness course provides learners with the unique opportunity to receive an introduction to the concepts of ITIL and ITSM. It provides an overview of the concepts within the ITIL best practices domain while also introducing the key ITIL processes. This non-certificate course explains how ITIL processes are driven by a Service Lifecycle to provide smooth functioning to organizations, thus ensuring high-quality services to their customers. It has been designed for learners who need a basic awareness of ITIL V3 as a general interest, as part of a larger program initiative as opposed to the full certification Foundation course or for those who may not be sure of their future V3 training path and want to assess ITIL / ITSM viability in their organization.

Audience:
The Awareness course will be of interest to:

IT Staff, IT and Business Executives, IT Consultants, Key Business Users, IT Developers.

Learning Objectives:
At the end of this course, the learner will be introduced to:

- Current business challenges
- Frameworks, Standards, Best Practices & Governance – where does ITIL fit?
- ITIL description and value
- IT Service Management concepts
- ITIL V2 versus V3
- ITIL qualifications
- The Lifecycle approach to Service Management
- ITIL’s processes within the Lifecycle context
- Concepts & terminology of each phase in the Lifecycle
• Additional information on key processes
• Implementation considerations

**Course Organizational Logistics:**
• A maximum of 25 students can attend this course with 1 instructor
• Classroom with U-shaped seating arrangement
• Whiteboard, flipchart, projector
• Course runs 8:30am – 4:00pm each day

**Prerequisites:**
None

**Course Student Material:**
Students receive a copy of the classroom presentation material.

**About the Examination:**
There is no exam associated with this course.

**Credits:**
None in the ITIL scheme

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ITIL® V3 Managing Across the Lifecycle Course

Course Description:
The Managing Across the Lifecycle Certificate is the final module of the Service Lifecycle and/or Service Capability Intermediate courses that leads to the ITIL® Expert in IT Service Management recognition. This 5-day course immerses learners in the contents of the ITIL V3 publications, focusing on business, management and supervisory objectives, purpose, processes, functions and activities, and on the interfaces and interactions between the processes covered in the Service Lifecycle. This course is designed using an engaging scenario-based approach to learning the core disciplines of the ITIL best practice and positions the student to successfully complete the associated exam.

Audience:
The Managing Across the Lifecycle course will be of interest to:
- Individuals who require a business and management level understanding of the ITIL V3 core Lifecycle and how it may be implemented to enhance the quality of IT service provision within an organization
- Individuals seeking the ITIL Expert certification in IT Service Management for which this qualification is the final mandatory module leading to the Expert certification
- Individuals seeking progress towards the ITIL Master in IT Service Management for which the ITIL Expert is a prerequisite
- A typical role includes (but is not restricted to): CIO, Senior IT Manager, IT Manager and Supervisor, IT professional and IT Operation practitioner.

Learning Objectives:
At the end of this course, the learner will gain competencies in:
- Introduction to IT Service Management business and managerial issues
- Managing the planning and implementation of IT Service Management
- Management of strategic change
- Risk management
- Understanding organizational challenges
- Service assessment
- Understanding complementary industry guidance
**Prerequisites:**
Candidates for this course must:

- Hold the ITIL Foundation Certificate in IT Service Management (2 credits from the V3 Foundation or V2 Foundation plus Bridge Certificate) and have obtained a further 15 credits (a total of at least 17 credits) as a minimum from a balanced selection of ITIL Service Lifecycle or Service Capability qualifications

**Credits:**
- Upon successful passing of the ITIL V3 Managing Across the Lifecycle exam, the student will be recognized with 5 credits in the ITIL qualification scheme.
- Project Management Institute – Professional Development Units (PDUs) = 38* subject to change

ITIL® is a Registered Trade Mark of the Office of Government Commerce in the United Kingdom and other countries.
ITIL® V3 Service Manager Bridge Course (ITSMA)

This accredited ITIL class is offered in partnership with ITSM Academy.

ITIL Training is based on a Qualification Scheme and Point System. The ITIL Expert, similar to the V2 Manager's Certificate in Service Management, is awarded upon reaching 22 credits inside the Training Scheme. This is now the highest scholastic achievement inside of IT Service Management. For ITIL Service Manager professionals, the ITIL V3 Managers Bridge Course is the quickest and most cost effective approach to earn the ITIL Expert™ Certification.

Embedded into the Managers Bridge course is ITSM Academy's unique virtualization, Living the Lifecycle®. Woven through all ITSM Academy's ITIL Certification courses, this virtualization brings the concepts and processes to life. Within a virtual business environment, a new web service is introduced and then, as a group, we guide the service through its strategy, design, transition, operation and continual improvement within a virtual business environment.

The course covers the subject areas of all five (5) lifecycle stages which are new to V3 and those existing subject areas of V2 which have undergone significant change. It bridges the gap between the ITIL V2 Service Manager Certificate in IT Service Management and the V3 Advanced Certification, the ITIL Expert™.

Project Management Institute (PMI) Professional Development Units (PDUs):
ITSM Academy is recognized by PMI as a Global R.E.P. Project Management Professionals earn 38 contact hours or PDUs upon completion of this course.

Instructors:
As with all ITSM Academy Training, our instructors have successful track records as IT professionals / practitioners and bring that acumen into the classroom. Utilizing the highest quality content, our trainers blend their real life experiences into lively classroom discussion. Trainers for this course are ITIL Expert™ and Service Manager certified.

Prerequisites:
This course is only intended for those holding a valid Manager's Certificate in IT Service Management based on ITIL versions 1 or 2 and those V2 Practitioners who have accrued sufficient credits. Existing Service Managers (17 credits) may sit for the V3 Managers Bridge course (5 day, 5 credits) and pass the examination to achieve the ITIL Expert™ Certification. ITIL Practitioners (with 12+ credits) will need to also take and pass the Managing Across the Lifecycle (MALC) course to earn their ITIL Expert™.
Exam & Certification:
Successfully passing the ninety (90) minute, multiple-choice exam on the final day of class, leads to the ITIL Managers Bridge Certificate in IT Service Management. The passing score is 80% (16 of 20). The exam consists of ten (10) Scenarios with two (2) questions on each, for a total of twenty (20) scenario-based, complex multiple-choice questions.

Audience:
- Individuals currently possessing a V2 ITIL Manager's certificate wishing to learn the ITIL V3 Service Lifecycle
- Individuals currently possessing a V2 ITIL Manager's certificate wishing to bridge their certification to ITIL Expert™
- Individuals possessing at least three (3) ITIL V2 Practitioner certifications - to complete the bridging process, these individuals will also have to take and pass the Managing Across the Lifecycle course

Learning Objectives:
ITSM Academy's V3 Managers Bridge course examines the new topics in ITIL V3 and compares the main differences from earlier versions. In addition to preparing delegates for the examination, the course also allows learners to:

- Understand the Differences between V2 and V3
- Examine the Service Lifecycle in detail
- Understand V3 Key Terms and Concepts
- Understand the new roles and models defined in ITIL V3

Course / Student Material:
- Five (5) days of Instructor Led Education
- Learner Manual (excellent post-class reference)
- Participation in unique ITSM Academy virtualization, Living the Lifecycle®
- Reinforcing Memory Games
- Exam Preparation
- In-Class Exam

Notes:
- The five books of the ITIL V3 library are not included as part of the course material. Learners must bring their own copies. They are available through ITSM Bookstore.
- Upon registration, learners are emailed a copy of the official syllabus to identify class pre-reading.
• Maximum Learners per Class is 16.

Contact us for corporate, onsite delivery of this class.

ITSM Academy Open Enrollment Class Terms and Conditions.

Please Note: ITIL Foundation certification is required to take the Exam. Proof of certification must be provided to ITSM Academy a minimum 2 weeks prior to the start of class. Please email certification information to tech@atg.org or fax it to 404.252.8118.

ITIL V3 Managers Bridge Course.

ITIL® is a registered trademark of the Office of Government Commerce (OGC).
# About this Course

Java 6 Programming Fundamentals for OO Developers (C++, etc.) is a five-day, comprehensive hands-on workshop geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 6, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development.

## At Course Completion

Students who attend Java 6 Programming Fundamentals for OO Developers will leave this course armed with the required skills to develop solid object-oriented applications written in Java, using sound coding techniques and best coding practices. Geared for developers with prior OO development experience in languages such as C++ or SmallTalk, this course will teach students everything they need to become productive in essential Java programming.

Working within in a dynamic, hands-on learning environment, guided by our expert team, attendees will learn to:

- Understand not only the fundamentals of the Java language, but also its importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Learn to use Java multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java 6 features and capabilities
- Work with the logging API and framework that is part of the Java platform
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Understand and work with the classes in the concurrent package
- Outline the options for GUI applications in Java
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Throughout the five-day course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review.

## Prerequisites

Working knowledge of object-oriented programming languages such as C++.

## Course Outline

### Java: A First Look

**Lesson - Using the JDK**
- Setting Up Environment
- The Development Process
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Applications and Applets

### Lesson - Writing a Simple Class

- Classes in Java™
- What Is a Class?
- Defining the Class
- Class Modifiers
- Class Instance Fields
- Instance Fields Diagram
- Primitives vs. Object References
Programming Fundamentals for OO Developers (C++, etc)

COURSE OUTLINE

• Creating Objects
• The main Method
• Using the Dot Operator
• Writing Output

Lesson - The Java™ Platform
• Defining Java
• Java Provides Several Platforms
• Note on Terminology
• Java SE 6
• Java SE Development Kit (JDK)
• Executing Programs
• Lifecycle of a Java Program
• Responsibilities of JVM
• Java is Dynamic: The Runtime Process
• Primary Areas of the JVM Runtime
• Garbage Collection
• Documentation and Code Reuse
• JavaDoc Provides Documentation Delivery
• In-Line Comments are Translated into HTML Rendering
• Working with Java in Your Environment

Session
Object-Oriented Concepts In Java

Lesson - Object-Oriented Programming
• The Object Oriented Way
• Real-World Objects
• Classes and Objects
• Examples of Classes and Objects
• Classes and Objects Diagram
• Object Behavior
• Methods and Messages

Lesson - Inheritance, Abstraction, and Polymorphism
• Encapsulation
• Inheritance
• Method Overriding
• Aggregation
• Type Abstraction - Grouping as Supertype
• Polymorphism
• Polymorphism Diagram

Session
Getting Started with Java™

Lesson - Adding Methods to the Class
• Instance Methods
• Passing Parameters Into Methods
• Returning a Value From a Method
• Overloaded Methods
• Overloaded Methods Diagram

Lesson - Language Statements
• Operators
• Comparison and Logical Operators
• Looping: The for Statement
• Looping: The while Statement
• Looping: The do Statement
• Continue and Break Statements
• The switch Statement

Lesson - Using Strings
• Strings
• String Method
• String Equality
• StringBuffer
• Strings, StringBuffer, and StringBuilder
• StringTokenizer
• Scanner
• Scanner - File Source
• Scanner - Getting Input
• Scanner - Testing for Tokens
• Scanner - Patterns for Tokens
• Formatter
• Formatter - Probable First Encounters
• Formatter - StringBuffer

Lesson - Specializing in a Subclass
• Extending a Class
• The extends Keyword
• Casting
• Overriding Superclass Methods
• Method Overriding Diagram
• Calling Superclass Methods from Subclass
• The Object Class
• The equals Method
• Default Constructor
• Implicit Constructor Chaining
• Passing Data Up Constructor Chain
• A Common Programming Mistake
• Editing Tools in Your IDE

Session
Essential Java™ Programming

Lesson - Fields and Variables
• Fields vs. Variables
• Data Types
• Default Values
• Block Scoping Rules
### Programming Fundamentals for OO Developers (C++, etc)

**Lesson - Using Arrays**
- Arrays
- Accessing the Array
- Multidimensional Arrays

**Lesson - Static Methods and Fields**
- Static Fields
- Simple Example of Static Fields
- Static Methods
- Lesson - Java™ Packages
  - The Problem
  - Packages
  - Class Location of Packages
  - The Package Keyword
  - Importing Classes
  - Executing Programs
  - Visibility
  - Java Naming Conventions
  - Packages Diagram
  - Refactoring in Your IDE

**Session**
**Advanced Java™ Programming**

**Lesson - Inheritance and Polymorphism**
- Polymorphism
- Polymorphism: The Subclasses
- Treating Derived Classes as the Superclass
- Casting to the Derived Class
- Using instanceof For Downcasting
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

**Lesson - Interfaces and Abstract Classes**
- Separating Capability from Implementation
- Abstract Classes
- Shape as an Abstract Class
- Polymorphism With Abstract Classes
- Interfaces
- Implementing an Interface
- Extending Interfaces
- Polymorphism With Interfaces
- Type Checking
- Abstract Classes vs. Interfaces
- Interfaces Diagram

**Lesson - Exceptions**
- What is an Exception?
- Exception Architecture
- Handling Exceptions
- The Throwable Class
- The try Block
- The catch Block
- The finally Block
- Full Example of Exception Handling
- Generalized vs. Specialized Exceptions
- Overriding Methods
- Creating Your Own Exceptions
- Throwing Exceptions
- Re-throwing an Exception
- Checked vs. Unchecked Exceptions
- Debugging in Your IDE

**Session**
**Java™ Developer's Toolbox**

**Lesson - Utility Classes**
- Wrapper Classes
- The Number Class
- Numbers and Strings
- Big Decimal
- Random Numbers
- Decimal Formatting
- The Date Class

**Lesson - Vector and Hashtable**
- The Vector Class
- Creating and Using a Vector
- Java Collections Methods in Vector
- Hashtables
- Understanding How Hashing Works
- Creating and Using a Hashtable
- Performing Lookups

**Lesson - Collections**
- The Collections Framework
- Collections Feature Types
- Collections Interface Hierarchy
- Map Interfaces
- Optional Methods
- The Collection Interface
- Iterators
- The Set Interface
- SortedSet
- Set and SortedSet Example
- Comparable and Comparator
- The List Interface
- List Example
Lesson - Generics

• Generics and Parametric Polymorphism
• Simple Generics
• The Mechanics of Generics
• Generics and Subtyping
• Compiler Restrictions on Generics and Subtyping
• Generics as Arguments in Methods
• Rationale Behind Wildcards
• Wildcards In Use
• Regular Wildcards in Method Parameters
• Bounded Wildcards
• Standard Rules Apply
• Generic Methods
• Interoperability with Legacy Code
• Raw Types
• Legacy Calls To Generics
• When Generics Should Be Used
• Build Paths in Your IDE

Lesson - Overview of Java GUIs

• JFC - Java Foundation Classes
• Categories of Classes in JFC
• Creating the Frame
• Adding Content to a Frame
• A Closer Look at Layout Managers
• BorderLayout
• JFC Provides an Event Handling Structure

Lesson - Autoboxing, Enhanced for Loop and Varargs

• Autoboxing/Unboxing
• Autoboxing/Unboxing Issues
• For() Loops and Collections
• The Enhanced for() Loop
• Another Example - Problematic
• Another Example - Enhanced for()

Lesson - Enumerations and Static Imports

• Rationale for Enumerations
• Enumeration Syntax
• Enumerations Methods
• Enumerations as a Better Class Type
• Enumeration Code
• EnumSet
• EnumMap
• When You Should Use Enumerations
• Using Static Imports
• When You Should Use Static Imports

Lesson - Inner Classes

• Defining Inner Classes
• Member Inner Classes
• Local Inner Classes
• Anonymous Inner Classes
• Anonymous Subclassing

Lesson - Multithreading

• Principles of Multithreading
• Creating a Threaded Class
• Creating a Threaded Class Using Runnable
• Example: Threaded Class
• Example: Runnable Class
• Basic Features of the Thread Class
• Daemon Threads
• Thread Scheduling
• Signaling a Thread
• Sleeping
• Thread Synchronization
• Synchronized Methods
• Synchronized Block
• Object Synchronization

Lesson - Java I/O

• The Java I/O Mechanism
• Byte Level I/O
• Subclasses Accessing Real Data
• Filter Classes
• Reading Stream as Data Primitives
• Adding Buffering for Better Performance
• Writing Buffered Data to a File
• Character Level I/O
• Subclasses Accessing Real Data
Lesson - Introduction to Annotations
- Annotations Overview
- Working with Java Annotations
- Example of Using @Override
- Annotations are Heavily Used in Many Technologies
- Declaring Persistence in Hibernate

Session
Java™ Application Development

Lesson - File System Access
- The File Class
- File Utility Methods
- RandomAccessFile
- Byte-Based File Access
- Text-Based File Access
- FileReader Diagram

Lesson - Networking
- Socket Programming Fundamentals
- Communicating on a Socket
- Single-Threaded Server Performance
- Creating a Threaded Server
- Sending and Receiving Objects
- Useful Methods

Lesson - JDBC ™
- What is JDBC?
- Structured Query Language (SQL)
- Connecting to the Database
- Statements
- Statement and PreparedStatement
- ResultSet
- JDBC Diagram
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency
- Mapping SQL Types to Java Types
- Database Connection Via JDBC Calls
- Rationale for Connection Pooling

Lesson - Java Logging
- Why Logging?
- Logging Framework
- Logging in Java
- Java Logging Framework
- The Logger Class
- Global Configuration
- Logging Levels
- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

Lesson - New In Java 6
- Java 6 - Performance
- Java 6 - Security Improvements
- Java 6 - Web Services Improvements
- Java 6 - Development
- Java 6 - GUI
- Java 6 - Compression
- Java 6 - Collection Interfaces
- Java 6 - Concrete Implementation
- Java 6 - Retrofitted
- Java 6 - More on Collection
- Java 6 - I/O
- Java 6 - Internationalization
- The JAXB Difference
Linux Fundamentals

About this Course

The Linux Fundamentals course presents fundamental skills and concepts that you will use on the job in any type of Linux career.

Prerequisite

Basic knowledge of computer hardware, software, and operating system.

Target Audience

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration.

At Course Completion

Upon successful completion of this course, students will be able to:

- Identify basic Linux concepts and perform basic Linux tasks
- Manage user and group accounts
- Be able to describe partitions in the Linux Filesystem
- Work with Linux permissions
- Work with the Bash shell
- Manage processes and jobs
- Manage system services
- Install the Linux operating system
- Use a Graphical User Interface

Course Outline

Lesson 1: Familiarizing Yourself with Linux

Topic 1A: Review the History and Development of Linux
Topic 1B: Enter Shell Commands
Topic 1C: Get Help Using Linux
Topic 1D: Start and Stop Linux

Lesson 2: Managing User and Group Accounts

Topic 2A: Create User and Group Accounts
Topic 2B: Configure User Profiles
Topic 2C: Manage User and Group Accounts
Lesson 3: Managing Partitions and the Linux File System
Topic 3A: Create Partitions
Topic 3B: Navigate through the Linux Filesystem
Topic 3C: Manage the Filesystem
Topic 3D: Maintain the Filesystem

Lesson 4: Managing Files in Linux
Topic 4A: Create and Edit Files
Topic 4B: Locate Files

Lesson 5: Working with Linux Permissions and Ownership
Topic 5A: Modify File and Directory Permissions
Topic 5B: Modify Default Permissions
Topic 5C: Modify File and Directory Ownership

Lesson 7: Managing Packages
Topic 7A: Manage Packages Using RPM
Topic 7B: Verify Packages
Topic 7C: Upgrade Packages
Topic 7D: Configure Repositories
Topic 7E: Manage Packages Using YUM
Topic 7F: Manage Packages Using the Debian Package Manager
Topic 7G: Work with Source Files

Lesson 8: Managing Kernel Services
Topic 8A: Explore the Linux Kernel
Topic 8B: Customize Kernel Modules
Topic 8F: Monitor Processes and Resources

Lesson 9: Working with the Bash Shell and Shell Scripts
Topic 9A: Perform Basic Bash Shell Operations
Topic 9B: Introduction to Shell Scripting
Topic 9C: Customize the Bash Shell
Topic 9D: Redirect Standard Input and Output

Lesson 10: Managing Jobs and Processes
Topic 10A: Manage Jobs and Background Processes
Topic 10B: Manage Processes Using the Process Table
Topic 10C: Examine Delayed and Detached Jobs
Topic 10D: Schedule Jobs
Topic 10E: Maintain the System Time

Lesson 11: Managing System Services
Topic 11A: Configure System Services
Topic 11B: Monitor System Logs
Topic 11C: Configure SELinux

Lesson 12: Configuring Network Services
Topic 12A: Connect to a Network
Topic 12B: Configure Routes
Topic 12C: Configure DHCP
Topic 12D: Configure DNS
Topic 12E: Implement Network File Sharing Services

Lesson 13: Configuring Basic Internet Services
Topic 13A: Configure a Web Server
Topic 13B: Implement Apache Access Control
Topic 13D: Configure Email Services
Topic 13E: Control Internet Services

Lesson 14: Securing Linux
Topic 14A: Examine the Basics of System Security
Topic 14B: Secure User Accounts

Lesson 15: Managing Hardware
Topic 15A: Identify Common Hardware Components and Resources
Topic 15C: Configure Removable Hardware
Topic 15D: Configure Mass Storage Devices
Topic 15E: Manage Logical Volumes Using the Logical Volume Manager
Topic 15F: Configure Disk Quotas

Lesson 16: Troubleshooting Linux Systems
Topic 16A: Troubleshoot System-Based Issues
Topic 16B: Troubleshoot Hardware Issues
Topic 16C: Troubleshoot Network Connection and Security Issues
Lesson 17: Installing Linux
Topic 17A: Prepare for Installation
Topic 17B: Identify Phases of the Linux Boot Sequence
Topic 17C: Configure GRUB
Topic 17D: Install the Operating System
Topic 17E: Perform Post-Installation Tasks

Lesson 18: Configuring the GUI
Topic 18A: Implement X
Topic 18B: Customize the Display Manager
Topic 18C: Customize the Window Environment
Linux Fundamentals

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Topic 18A: Implement X
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The Red Hat Certified System Administration (RHCSA) boot camp is designed for experienced Linux system administrators who want to expand their technical skill sets and become accredited with the Red Hat Certified System Administration (RHCSA) certification. To successfully navigate this course, students must already have solid experience with the Linux command line—including the necessary skills to execute common commands, such as cp, grep, sort, mkdir, tar, mkfs, ssh, and yum—and be familiar with accessing man pages for help.

**Course Content**

- Installation, configuration, and management of local storage
- Deployment and maintenance of network services
- Network services: VNC, SSH, FTP, and web
- Securing files with ACLs
- Securing network services with firewall and SELinux
- Managing virtual machines with KVM technology
- Automating installation of Linux using Kickstart

**Course Outline**

Chapter 1: Prepare for Red Hat Hands-on Certifications  
Chapter 2: Virtual Machines and Automated Installations  
Chapter 3: Fundamental Command Line Skills  
Chapter 4: RHCSA-Level Security Options  
Chapter 5: The Boot Process  
Chapter 6: Linux Filesystem Administration  
Chapter 7: Package Management  
Chapter 8: User Administration  
Chapter 9: RHCSA Level System Administration Tasks  
Chapter 10: A Security Primer  
Chapter 11: System Services and SELinux  
Chapter 12: RHCE Administrative Tasks  
Chapter 13: Electronic Mail Servers  
Chapter 14: The Apache Web Server  
Chapter 15: The Samba File Server  
Chapter 16: More File Sharing Services  
Chapter 17: Administrative Services: DNS, NTP, and Logging
Microsoft SQL Server 2012 Boot Camp

About this Course

The Microsoft Certified Solutions Associate (MCSA): SQL Server 2012 certification shows that you have the primary set of SQL Server skills that are relevant across multiple solution areas in a business environment. The MCSA: SQL Server 2012 certification is a prerequisite for earning the MCSE: Data Platform or Business Intelligence certification.

MCSA Candidate Profile

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA SQL Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSA: SQL Server 2012

The primary goal of this program is to help each student pass the exams required to earn the MCSA SQL Server 2012 certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Introduction to Microsoft SQL Server 2012. This module introduces the SQL Server platform and major tools. It discusses editions, versions, tools used to query, documentation sources, and the logical structure of database.

Lessons

- Introducing Microsoft SQL Server 2012
- Getting Started with SQL Server Management Studio

Module 2: Getting Started with SQL Azure

This module introduces you to the concepts of SQL Azure. If the virtual machines in your classroom are able to connect to the internet and you have a Windows Azure account you may be able to connect to your Azure server and database. Many of the labs in the rest of this course are enabled for you to perform the lab while connected to your own Azure database in the cloud.
Lessons

- Overview of SQL Azure
- Working with SQL Azure

Module 3: Introduction to T-SQL Querying. This module introduces Transact SQL as the primary querying language of SQL Server. It discusses the basic structure of T-SQL queries, the logical flow of a SELECT statement, and introduces concepts such as predicates and set-based operations.

Lessons

- Introducing T-SQL
- Understanding Sets
- Understanding Predicate Logic
- Understanding the Logical Order of Operations in SELECT statements

Module 4: Writing SELECT Queries. This module introduces the fundamentals of the SELECT statement, focusing on queries against a single table.

Lessons

- Writing Simple SELECT Statements
- Eliminating Duplicates with DISTINCT
- Using Column and Table Aliases
- Writing Simple CASE Expressions

Module 5: Querying Multiple Tables. This module explains how to write queries which combine data from multiple sources in SQL Server. The module introduces the use of JOINs in T-SQL queries as a mechanism for retrieving data from multiple tables.

Lessons

- Understanding Joins
- Querying with Inner Joins
- Querying with Outer Joins
- Querying with Cross Joins and Self Joins

Module 6: Sorting and Filtering Data. This module explains how to enhance queries to limit the rows they return, and to control the order in which the rows are displayed. The module also discusses how to resolve missing and unknown results.

Lessons

- Sorting Data
- Filtering Data with a WHERE Clause
- Filtering with the TOP and OFFSET-FETCH Options
• Working with Unknown and Missing Values

Module 7: Working with SQL Server 2012 Data Types. This module explains the data types SQL Server uses to store data. It introduces the many types of numeric and special-use data types. It also explains conversions between data types, and the importance of type precedence.

Lessons

• Introducing SQL Server 2012 Data Types
• Working with Character Data
• Working with Date and Time Data

Module 8: Using Built-In Functions. This module introduces the use of functions that are built in to SQL Server Denali, and will discuss some common usages including data type conversion, testing for logical results and nullability.

Lessons

• Writing Queries with Built-In Functions
• Using Conversion Functions
• Using Logical Functions
• Using Functions to Work with NULL

Module 9: Grouping and Aggregating Data. This module introduces methods for grouping data within a query, aggregating the grouped data and filtering groups with HAVING. The module is designed to help the student grasp why a SELECT clause has restrictions placed upon column naming in the GROUP BY clause as well as which columns may be listed in the SELECT clause.

Lessons

• Using Aggregate Functions
• Using the GROUP BY Clause
• Filtering Groups with HAVING

Module 10: Using Subqueries. This module will introduce the use of subqueries in various parts of a SELECT statement. It will include the use of scalar and multi-result subqueries, and the use of the IN and EXISTS operators.

Lessons

• Writing Self-Contained Subqueries
• Writing Correlated Subqueries
• Using the EXISTS Predicate with Subqueries
Module 11: Using Table Expressions. This module introduces T-SQL expressions which return a valid relational table, typically for further use in the query. The module discusses views, derived tables, common table expressions and inline table-valued functions.

Lessons

- Using Derived Tables
- Using Common Table Expressions
- Using Views
- Using Inline Table-Valued Functions

Module 12: Using Set Operators. This module introduces operations involving multiple sets of data. It will cover the use of the UNION, UNION ALL, APPLY, CROSS APPLY, OUTER APPLY operators as well as the EXCEPT and INTERSECTS operators.

Lessons

- Writing Queries with the UNION Operator
- Using EXCEPT and INTERSECT
- Using APPLY

Module 13: Using Window Ranking, Offset and Aggregate Functions. This module introduces window functions including ranking, aggregate and offset functions. Much of this functionality is new to SQL Server 2012. It will cover the use of T-SQL functions such as ROW_NUMBER, RANK, DENSE_RANK, NTILE, LAG, LEAD, FIRST_VALUE and LAST_VALUE to perform calculations against a set, or window, of rows.

Lessons

- Creating Windows with OVER
- Exploring Window Functions

Module 14: Pivoting and Grouping Sets. This module discusses techniques for pivoting data in T-SQL as well to introduce the fundamentals of the GROUPING SETS clause. It will also cover the use of GROUP BY ROLLUP and GROUP BY CUBE syntax in SQL Server 2012.

Lessons

- Writing Queries with PIVOT and UNPIVOT
- Working with Grouping Sets

Module 15: Querying SQL Server Metadata. This module introduces the use of SQL Server system objects in T-SQL queries. It will cover the use of system catalog views, system stored procedures, system functions, and dynamic management objects.

Lessons

- Querying System Catalog Views and Functions
Module 16: Executing Stored Procedures. This module introduces the use of existing stored procedures in a T-SQL querying environment. It discusses the use of EXECUTE, how to pass input and output parameters to a procedure, and how to invoke system stored procedures.

Lessons

- Querying Data with Stored Procedures
- Passing Parameters to Stored Procedures
- Creating Simple Stored Procedures
- Working with Dynamic SQL

Module 17: Programming with T-SQL. This module provides a basic introduction to T-SQL programming concepts and objects. It discusses batches, variables, control of flow elements such as loops and conditionals, how to create and execute dynamic SQL statements, and how to use synonyms.

Lessons

- T-SQL Programming Elements
- Controlling Program Flow

Module 18: Implementing Error Handling. This module introduces the use of error handlers in T-SQL code. It will introduce the difference between compile errors and run-time errors, and will cover how errors affect batches. The module will also cover how to control error handling using TRY/CATCH blocks, the use of the ERROR class of functions, and the use of the new THROW statement.

Lessons

- Using TRY / CATCH Blocks
- Working with Error Information

Module 19: Implementing Transactions. This module introduces the concepts of transaction management in SQL Server. It will provide a high-level overview of transaction properties, cover the basics of marking transactions with BEGIN, COMMIT and ROLLBACK.

Lessons

- Transactions and the Database Engine
- Controlling Transactions

Module 20: Improving Query Performance. This module introduces the concepts of system resource usage and the performance impact of querying SQL Server 2012. It will cover, at a high level, the use of indexes in SQL Server, the use of execution plans in SQL Server Management Studio, and the use of SET options to view system resource usage when executing queries. It will also compare set-based operations with cursor-based operations.
Lessons

- Factors in Query Performance
- Displaying Query Performance Data

Module 21: Designing and Implementing Tables. This module explains how to design, create, and alter tables. Also it focuses on working with schemas.

Lessons

- Designing Tables
- Working with Schemas
- Creating and Altering Tables

Module 22: Ensuring Data Integrity through Constraints. This module explains how to enforce data integrity, and implement domain integrity to maintain high quality data. Also it focuses on implementing Entity and Referential Integrity.

Lessons

- Enforcing Data Integrity
- Implementing Domain Integrity
- Implementing Entity and Referential Integrity

Module 23: Planning for SQL Server 2012 Indexing. This module explains the core indexing concepts and effectiveness of each data type commonly used in indexes.

Lessons

- Core Indexing Concepts
- Data Types and Indexes
- Single Column and Composite Indexes

Module 24: Implementing Table Structures in SQL Server 2012. This module explains how tables can be structured in SQL Server databases. Also it focuses on designing and working with clustered indexes.

Lessons

- SQL Server Table Structures
- Working with Clustered Indexes
- Designing Effective Clustered Indexes

Module 25: Reading SQL Server 2012 Execution Plans. This module explains how to design additional indexes. Also it focuses on how to read and interpret execution plans.

Lessons
• Execution Plan Core Concepts
• Common Execution Plan Elements
• Working with Execution Plans

Module 26: Improving Performance through Nonclustered Indexes. This module explains how nonclustered indexes have the potential to significantly enhance the performance of applications and how to use a tool that can help design these indexes appropriately.

Lessons

• Designing Effective Nonclustered Indexes
• Implementing Nonclustered Indexes
• Using the Database Engine Tuning Advisor

Module 27: Designing and Implementing Views. This module introduces Views, and explains how to create and manage Views. Also it focuses on the performance consideration for Views.

Lessons

• Introduction to Views
• Creating and Managing Views
• Performance Considerations for Views

Module 28: Designing and Implementing Stored Procedures. This module describes the potential advantages of the use of stored procedures along with guidelines on creating them.

Lessons

• Introduction to Stored Procedures
• Working With Stored Procedures
• Implementing Parameterized Stored Procedures
• Controlling Execution Context

Module 29: Merging Data and Passing Tables. This module reviews the techniques that provide the ability to process sets of data rather than individual rows. Also it focuses on how these techniques can be used in combination with TABLE parameter types to minimize the number of required stored procedure calls in typical applications.

Lessons

• Using the MERGE Statement
• Implementing Table Types
• Using TABLE Types As Parameters

Module 30: Designing and Implementing User-Defined Functions. This module explains how to design and implement user-defined functions that enforce business rules or data consistency, and modify and maintain existing functions written by other developers.
Lessons

- Overview of Functions
- Designing and Implementing Scalar Functions
- Designing and Implementing Table-Valued Functions
- Implementation Considerations for Functions
- Alternatives to Functions

Module 31: Creating Highly Concurrent SQL Server 2012 Applications. This module explains how to use transactions and the SQL Server locking mechanisms to meet the performance and data integrity requirements of your applications.

Lessons

- Introduction to Transactions
- Introduction to Locks
- Management of Locking
- Transaction Isolation Levels

Module 32: Handling Errors in T-SQL Code. This module explores T-SQL error handling, looks at how it has traditionally been implemented, and how structured exception handling can be used.

Lessons

- Understanding T-SQL Error Handling
- Implementing T-SQL Error Handling
- Implementing Structured Exception Handling

Module 33: Responding to Data Manipulation via Triggers. This module explains what DML triggers are and how they enforce data integrity. Also it focuses on the different types of triggers available, and how to define triggers in a database.

Lessons

- Designing DML Triggers
- Implementing DML Triggers
- Advanced Trigger Concepts

Module 34: Implementing Managed Code in SQL Server 2012. This module explains how to use CLR integrated code to create user-defined database objects that are managed by the .NET Framework.

Lessons

- Introduction to SQL CLR Integration
- Importing and Configuring Assemblies
- Implementing SQL CLR Integration
Module 35: Storing XML Data in SQL Server 2012. This module introduces XML and shows how XML data can be stored within SQL Server.

Lessons

- Introduction to XML and XML Schemas
- Storing XML Data and Schemas in SQL Server
- Implementing the XML Data Type

Module 36: Querying XML Data in SQL Server. This module shows how XML data can be queried, including queries written in a language called XQuery.

Lessons

- Using the T-SQL FOR XML Statement
- Getting Started with XQuery
- Shredding XML

Module 37: Working with SQL Server 2012 Spatial Data. This module introduces Spatial Data, and explains how to work with SQL Server Spatial Data Types.

Lessons

- Introduction to Spatial Data
- Working with SQL Server Spatial Data Types
- Using Spatial Data in Applications

Module 38: Working with Full-Text Indexes and Queries. This module introduces Full-Text Indexing and how to implement Full-Text Indexes in SQL Server.

Lessons

- Introduction to Full-Text Indexing
- Implementing Full-Text Indexes in SQL Server
- Working with Full-Text Queries

Module 39: Preparing Systems for SQL Server 2012. This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.

Lessons

- Overview of SQL Server Architecture
- Planning Server Resource Requirements
- Pre-installation Testing for SQL Server
Module 40: Installing and Configuring SQL Server 2012. This module details installing and configuring SQL Server.

Lessons

- Preparing to Install SQL Server
- Installing SQL Server
- Upgrading and Automating Installation

Module 41: Working with Databases. This module describes how data is stored in databases, how to create databases, and how to move databases either within a server or between servers.

Lessons

- Overview of SQL Server Databases
- Working with Files and Filegroups
- Moving Database Files

Module 42: Understanding SQL Server 2012 Recovery Models. This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server.

Lessons

- Backup Strategies
- Understanding SQL Server Transaction Logging
- Planning a SQL Server Backup Strategy

Module 43: Backup of SQL Server 2012 Databases. This module describes SQL Server Backup and the backup types.

Lessons

- Backing up Databases and Transaction Logs
- Managing Database Backups
- Working with Backup Options

Module 44: Restoring SQL Server 2012 Databases. This module describes the restoration of databases.

Lessons

- Understanding the Restore Process
- Restoring Databases
- Working with Point-in-time recovery
- Restoring System Databases and Individual Files
Module 45: Importing and Exporting Data. This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.

Lessons
  • Transferring Data To/From SQL Server
  • Importing and Exporting Table Data
  • Inserting Data in Bulk

Module 46: Authenticating and Authorizing Users. This module covers SQL Server security models, logins and users.

Lessons
  • Authenticating Connections to SQL Server
  • Authorizing Logins to Access Databases
  • Authorization Across Servers

Module 46: Assigning Server and Database Roles. This module covers fixed server roles, user-defined server roles, fixed database roles and user-defined database roles.

Lessons
  • Working with Server Roles
  • Working with Fixed Database Roles
  • Creating User-defined Database Roles

Module 47: Authorizing Users to Access Resources. This module covers permissions and the assignment of permissions.

Lessons
  • Authorizing User Access to Objects
  • Authorizing Users to Execute Code
  • Configuring Permissions at the Schema Level

Module 48: Auditing SQL Server Environments. This module covers SQL Server Audit.

Lessons
  • Options for Auditing Data Access in SQL
  • Implementing SQL Server Audit
  • Managing SQL Server Audit

Module 49: Automating SQL Server 2012 Management. This module covers SQL Server Agent, jobs and job history.
Lessons

- Automating SQL Server Management
- Working with SQL Server Agent
- Managing SQL Server Agent Jobs

Module 50: Configuring Security for SQL Server Agent. This module covers SQL Server agent security, proxy accounts and credentials.

Lessons

- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

Module 51: Monitoring SQL Server 2012 with Alerts and Notifications. This module covers the configuration of database mail, alerts and notifications.

Lessons

- Configuration of Database Mail
- Monitoring SQL Server Errors
- Configuring Operators, Alerts and Notifications

Module 52: Performing Ongoing Database Maintenance. This module covers database maintenance plans.

Lessons

- Ensuring Database Integrity
- Maintaining Indexes
- Automating Routine Database Maintenance

Module 53: Tracing Access to SQL Server 2012. This module covers SQL Profiler and SQL Trace stored procedures.

Lessons

- Capturing Activity using SQL Server Profiler
- Improving Performance with the Database Engine Tuning Advisor
- Working with Tracing Options

Module 54: Monitoring SQL Server 2012. This module introduces DMVs and the configuration of data collection.

Lessons
• Monitoring Activity
• Capturing and Managing Performance Data
• Analyzing Collected Performance Data

Module 55: Managing Multiple Servers. This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.

Lessons

• Working with Multiple Servers
• Virtualizing SQL Server
• Deploying and Upgrading Data-Tier Applications

Module 56: Troubleshooting Common SQL Server 2012 Administrative Issues. This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.

Lessons

• SQL Server Troubleshooting Methodology
• Resolving Service-related Issues
• Resolving Concurrency Issues
• Resolving Login and Connectivity Issues

Module 57: Introduction to Data Warehousing. This module provides an introduction to the key components of a data warehousing solution and the high-level considerations you must take into account when embarking on a data warehousing project.

Lessons

• Describe data warehouse concepts and architecture considerations
• Considerations for a Data Warehouse Solution

Module 58: Designing and Implementing a Data Warehouse This module describes how to implement the logical and physical architecture of a data warehouse based on industry proven design principles.

Lessons

• Logical Design for a Data Warehouse
• Physical Design for a Data Warehouse

Module 59: Design and implement a schema for a data warehouse This module discusses considerations for implementing an ETL process, and then focuses on SQL Server Integration Services (SSIS) as a platform for building ETL solutions.

Lessons
COURSE OUTLINE

• Introduction to ETL with SSIS
• Exploring Source Data
• Implementing Data Flow

Module 60: Implementing Control Flow in an SSIS Package This module describes how to implement control flow which allows users to design robust ETL processes for a data warehousing solution that coordinate data flow operations with other automated tasks.

Lessons

• Introduction to Control Flow
• Creating Dynamic Packages
• Using Containers
• Managing Consistency

Module 61: Debugging and Troubleshooting SSIS Packages. This module describes how you can debug packages to find the cause of errors that occur during execution. It then discusses the logging functionality built into SSIS that you can use to log events for troubleshooting purposes. Finally, the module describes common approaches for handling errors in control flow and data flow.

Lessons

• Debugging an SSIS Package
• Logging SSIS Package Events
• Handling Errors in an SSIS Package

Module 62: Implementing an Incremental ETL Process. This module describes the techniques you can use to implement an incremental data warehouse refresh process.

Lessons

• Introduction to Incremental ETL
• Extracting Modified Data
• Loading Modified Data

Module 63: Incorporating Data from the Cloud in a Data Warehouse. This modules describes how integrate cloud data into a data warehouse ecosystem.

Lessons

• Overview of Cloud Data Sources
• SQL Server Azure
• Azure Data Market

Module 64: Enforcing Data Quality. This modules describes how to use Data Quality Services (DQS) for
cleansing and deduplicating your data.

Lessons

- Introduction to Data Cleansing
- Using Data Quality Services to Cleanse Data
- Using Data Quality Services to Match Data

Module 65: Using Master Data Services. This module introduces Master Data Services and explains the benefits of using it in a business intelligence (BI) context. It also describes the key configuration options, explains how to import and export data and apply rules that help to preserve data integrity, and introduces the new Master Data Services Add-in for Excel.

Lessons

- Master Data Services Concepts
- Implementing a Master Data Services Model
- Using the Master Data Services Excel Add-in

Module 66: Extending SSIS. This module describes how to extend SSIS by using custom scripts and components.

Lessons

- Using Custom Components in SSIS
- Using Scripting in SSIS

Module 67: Deploying and Configuring SSIS Packages. This module describes how to deploy and configure SSIS packages.

Lessons

- Overview of Deployment
- Deploying SSIS Projects
- Planning SSIS Package Execution

Module 68: Consuming Data in a Data Warehouse. This module describes how information workers can consume data from the data warehouse.

Lessons

- Using Excel to Analyze Data in a data Warehouse.
- An Introduction to PowerPivot
- An Introduction to Crescent
MCSA Server 2012 Boot Camp

About this Course

The Microsoft Certified Solutions Associate (MCSA): Windows Server 2012 certification shows that you have the primary set of Windows Server skills that are relevant across multiple solution areas in a business environment. The MCSA: Windows Server 2012 certification is a prerequisite for earning the MCSE: Server Infrastructure certification, the MCSE: Desktop Infrastructure certification, or the MCSE: Private Cloud certification. This foundational certification validates your ability to work with Windows Server 2012 in a real-world business context.

MCSA Candidate Profile

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA Windows Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSA Server 2012

This primary goal of this course is to help each student pass the exams required to earn the MCSA Windows Server 2012 certification. To do this, our knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012

This module introduces students to the editions of Windows Server 2012 and the new Windows Server 2012 management tools. It also covers how to install Windows Server 2012, how to perform post-deployment tasks, and how to perform basic administrative tasks.

Lessons

- Windows Server 2012 Overview
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Overview of Windows Server 2012 Management
- Introduction to Windows PowerShell

Module 2: Introduction to Active Directory Domain Services.
This module covers the structure of Active Directory Domain Services (AD DS) and its various components, such as forest, domain, and organizational units (OUs). It also gives an overview of domain controllers, in addition to choices that are available with Windows Server 2012 for installing AD DS on a server.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects
This module describes how to manage user accounts and computer accounts, including how to manage various consumer devices that employees use. The module also covers how to manage an enterprise network by managing groups, and how to delegate administrative tasks to designated users or groups.

Lessons

- Managing User Accounts
- Managing Groups
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration.
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell

Module 5: Implementing IPv4
This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks. In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

Module 6: Implementing Dynamic Host Configuration Protocol
This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing DNS
This module describes name resolution for Windows operating system clients and Windows Server servers. It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6
This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Module 9: Implementing Local Storage
This module introduces several different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services
This module discusses how to provide file and print resources with Windows Server 2012. It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

Module 11: Implementing Group Policy
This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates

Module 12: Securing Windows Servers Using Group Policy Objects
This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

- Security Overview for Windows Operating Systems
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Configuring and Troubleshooting Domain Name System
This module explains how to configure and troubleshoot DNS, including DNS replication and caching.

Lessons

- Configuring the DNS Server Role
- Configuring DNS Zones
Module 15: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODCs
- Administering AD DS
- Managing the AD DS Database

Module 16: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts. It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons

- Configuring Password Policy and User Account Lockout Settings
- Configuring Managed Service Accounts

Module 17: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

- Introducing Group Policy
- Implementing and Administering GPOs
- Group Policy Scope and Group Policy Processing
- Troubleshooting the Application of GPOs

Module 18: Managing User Desktops with Group Policy
This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

- Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

Module 19: Installing, Configuring, and Troubleshooting the Network Policy Server Role
This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describe NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons
• Installing and Configuring a Network Policy Server
• Configuring RADIUS Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a Network Policy Server

Module 20: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons
• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Configuring IPSec Enforcement for NAP
• Monitoring and Troubleshooting NAP

Module 21: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons
• Overview of Remote Access
• Implementing DirectAccess by Using the Getting Started Wizard
• Implementing and Managing an Advanced DirectAccess Infrastructure
• Implementing VPN
• Implementing Web Application Proxy

Module 22: Optimizing File Services
This module describes FSRM, configure quotas, file screening, and storage reports and implement classification management and file management tasks. It describes the components of the DFS. I also explains how to configure DFS namespaces and DFS replication.

Lessons
- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of DFS
- Configuring DFS Namespaces
- Configuring and Troubleshooting DFS Replication

**Module 23: Configuring Encryption and Advanced Auditing**
This module explains how to encrypt files using EFS and configure advanced auditing features.

**Lessons**

- Encrypting Drives by Using BitLocker
- Encrypting Files by Using EFS
- Configuring Advanced Auditing

**Module 24: Deploying and Maintaining Server Images**
This module explains how to create and manage server images by using Windows Deployment Services

**Lessons**

- Overview of Windows Deployment Services
- Managing Images
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services

**Module 25: Implementing Update Management**
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

**Lessons**

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012**
This module explains the monitoring tools available in Windows Server 2012. It also explains how to use Performance Monitor and monitor events.

**Lessons**

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services**
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

Module 28: Implementing Advanced File Services
In this module students will be able to configure file services to meet advanced business requirements.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

Module 30: Implementing Distributed Active Directory Domain Services Deployments
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons
• AD DS Replication Overview
• Configuring AD DS Sites
• Configuring and Monitoring AD DS Replication

Module 32: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons

• Using Certificates in a Business Environment
• PKI Overview
• Deploying CAs
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Module 35: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement

Module 38: Implementing Business Continuity and Disaster Recovery
In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements

Lessons

• Data Protection Overview
• Implementing Windows Server Backup
• Implementing Server and Data Recovery
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- Windows Server 2012 Overview
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Overview of Windows Server 2012 Management
- Introduction to Windows PowerShell

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- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

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Lessons

- Managing User Accounts
- Managing Groups
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration.
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell

Module 5: Implementing IPv4
This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks. In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

Module 6: Implementing Dynamic Host Configuration Protocol
This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing DNS
This module describes name resolution for Windows operating system clients and Windows Server servers. It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6
This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Module 9: Implementing Local Storage
This module introduces several different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services
This module discusses how to provide file and print resources with Windows Server 2012. It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

**Module 11: Implementing Group Policy**
This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates

**Module 12: Securing Windows Servers Using Group Policy Objects**
This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

- Security Overview for Windows Operating Systems
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V**
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Configuring and Troubleshooting Domain Name System**
This module explains how to configure and troubleshoot DNS, including DNS replication and caching.

Lessons

- Configuring the DNS Server Role
- Configuring DNS Zones
• Configuring DNS Zone Transfers
• Managing and Troubleshooting DNS

Module 15: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons

• Overview of AD DS
• Implementing Virtualized Domain Controllers
• Implementing RODCs
• Administering AD DS
• Managing the AD DS Database

Module 16: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts. It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons

• Configuring Password Policy and User Account Lockout Settings
• Configuring Managed Service Accounts

Module 17: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

• Introducing Group Policy
• Implementing and Administering GPOs
• Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

Module 18: Managing User Desktops with Group Policy
This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

• Implementing Administrative Templates
Module 19: Installing, Configuring, and Troubleshooting the Network Policy Server Role
This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describe NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons
- Installing and Configuring a Network Policy Server
- Configuring RADIUS Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a Network Policy Server

Module 20: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons
- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Configuring IPSec Enforcement for NAP
- Monitoring and Troubleshooting NAP

Module 21: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons
- Overview of Remote Access
- Implementing DirectAccess by Using the Getting Started Wizard
- Implementing and Managing an Advanced DirectAccess Infrastructure
- Implementing VPN
- Implementing Web Application Proxy

Module 22: Optimizing File Services
This module describes FSRM, configure quotas, file screening, and storage reports and implement classification management and file management tasks. It describes the components of the DFS. It also explains how to configure DFS namespaces and DFS replication.

Lessons
• Overview of FSRM
• Using FSRM to Manage Quotas, File Screens, and Storage Reports
• Implementing Classification and File Management Tasks
• Overview of DFS
• Configuring DFS Namespaces
• Configuring and Troubleshooting DFS Replication

**Module 23: Configuring Encryption and Advanced Auditing**
This module explains how to encrypt files using EFS and configure advanced auditing features.

Lessons

• Encrypting Drives by Using BitLocker
• Encrypting Files by Using EFS
• Configuring Advanced Auditing

**Module 24: Deploying and Maintaining Server Images**
This module explains how to create and manage server images by using Windows Deployment Services

Lessons

• Overview of Windows Deployment Services
• Managing Images
• Implementing Deployment with Windows Deployment Services
• Administering Windows Deployment Services

**Module 25: Implementing Update Management**
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

Lessons

• Overview of WSUS
• Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012**
This module explains the monitoring tools available in Windows Server 2012. It also explains how to use Performance Monitor and monitor events.

Lessons

• Monitoring Tools
• Using Performance Monitor
• Monitoring Event Logs

**Module 27: Implementing Advanced Network Services**
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

Module 28: Implementing Advanced File Services
In this module students will be able to configure file services to meet advanced business requirements.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

Module 30: Implementing Distributed Active Directory Domain Services Deployments
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons
• AD DS Replication Overview
• Configuring AD DS Sites
• Configuring and Monitoring AD DS Replication

Module 32: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons
• Using Certificates in a Business Environment
• PKI Overview
• Deploying CAs
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons
• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons
• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Module 35: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons
• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

**Module 36: Implementing Failover Clustering**  
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

**Lessons**

• Overview of Failover Clustering  
• Implementing a Failover Cluster  
• Configuring Highly Available Applications and Services on a Failover Cluster  
• Maintaining a Failover Cluster  
• Implementing a Multi-Site Failover Cluster

**Module 37: Implementing Failover Clustering with Hyper-V**  
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

**Lessons**

• Overview of Integrating Hyper-V with Failover Clustering  
• Implementing Hyper-V Virtual Machines on Failover Clusters  
• Implementing Hyper-V Virtual Machine Movement

**Module 38: Implementing Business Continuity and Disaster Recovery**  
In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements.

**Lessons**

• Data Protection Overview  
• Implementing Windows Server Backup  
• Implementing Server and Data Recovery
Windows Server 2012 Boot Camp

About this Course

The Microsoft Certified Solutions Associate (MCSA): Windows Server 2012 certification Show that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSA: Windows Server 2012 certification will qualify you for a position as a network or computer systems administrator or a computer support specialist. The MCSA: Windows Server 2012 certification is a prerequisite for earning the MCSE: Server Infrastructure certification.

MCSA Candidate Profile

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA Windows Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSA: Windows Server 2012

The primary goal of this program is to help each student pass the exams required to earn the MCSA Windows Server 2012 certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement
• Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

• Overview of Disaster Recovery
• Implementing Windows Server Backup
• Implementing Server and Data Recovery
About this Course

This 14-day instructor-led course provides you with the skills and knowledge needed to plan, design, and implement a Windows 8 desktop infrastructure. The course provides guidance on planning and deploying desktops by using several technologies such as User State Migration Tool (USMT), Microsoft Deployment Toolkit (MDT), Virtual Desktop Infrastructure (VDI), and more. Additionally, the course describes how to protect desktops and monitor their health and performance, build the skills you need to design, deploy, and manage a physical and virtual Windows Server 2012 application management infrastructure, and focus on using Microsoft System Center 2012 Service Pack 1 (SP1). You will also learn to design, deploy, and manage Windows 8 Enterprise applications in a physical and virtual environment and in the cloud.

MCSE Candidate Profile

This course is intended for Information Technology professionals who are interested in specializing in Windows 8 application deployments and managing the application environments for large organizations. People attending this training could be support technicians or currently in deployment roles and are considering taking the next step in their career or enhancing their skills in the areas of planning and deploying Windows 8 desktops.

At Course Completion

- Plan an image management strategy.
- Implement desktop security.
- Capture and manage a desktop operating system image.
- Plan and implement User State Migration.
- Plan and deploy desktops by using the Microsoft Deployment Toolkit.
- Plan and deploying desktops by using System Center 2012 Configuration Manager.
- Plan and implement a Remote Desktop Services infrastructure.
- Manage user state virtualization for enterprise desktops.
- Plan and implement an updates infrastructure to support enterprise desktops.
- Protect enterprise desktops from malware and data loss.
- Monitoring the performance and health of the desktop infrastructure. Design an application distribution strategy that is appropriate for an organizational environment.
- Diagnose and remediate application compatibility problems for desktop and presentation virtualization-based deployments.
- Use Group Policy and Windows Intune to deploy applications to client devices.
• Deploy applications centrally using System Center 2012 Configuration Manager SP1.
• Configure self-service application deployment using System Center 2012 Configuration Manager SP1, System Center 2012 Service Manager SP1, and Windows Store apps.
• Design and deploy Windows Server 2012 roles and features to support presentation virtualization.
• Design and deploy Windows Server 2012 roles and features to support application virtualization.
• Virtualize and deploy applications by using App-V and System Center 2012 Configuration Manager SP1.
• Plan and configure the appropriate infrastructure to streamline the deployment of software updates to applications, and plan and configure application security.
• Plan and implement application upgrades and application coexistence.
• Monitor the deployment, performance, and utilization of applications and determine whether current application hosting platforms are meeting business needs.

**Course Outline**

**Module 1: Deploying and Managing Windows Server 2012.** This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

**Lessons**

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell

**Module 2: Introduction to Active Directory Domain Services.** This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

**Lessons**

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

**Module 3: Managing Active Directory Domain Services Objects.** This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.
Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Super-netting
- Configuring and Troubleshooting IPv4

Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP
Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.

Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.
Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services

**Module 15: Configuring and Troubleshooting Domain Name System.** This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.
Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

**Module 16: Maintaining Active Directory Domain Services.** This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

**Module 17: Managing User and Service Accounts.** This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

**Module 18: Implementing a Group Policy Infrastructure.** This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
- Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.
Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.
Lessons

- PKI Overview
- Deploying CAs
- Deploying and Configuring CA Hierarchy
- Deploying and Managing Certificate Templates
- Implementing Certificate Distribution and Revocation
- Managing Certificate Recovery

**Module 33: Implementing Active Directory Rights Management Services.** This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

**Module 34: Implementing Active Directory Federation Services.** This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

**Module 35: Implementing Network Load Balancing.** This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation
Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

- Overview of Failover Clustering
- Implementing a Failover Cluster
- Configuring Highly Available Applications and Services on a Failover Cluster
- Maintaining a Failover Cluster
- Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Assessing and Determining Desktop Deployment Options. This module describes the enterprise desktop lifecycle and explains how you can assess hardware and infrastructure readiness. The module then describes how to identify and select the most appropriate deployment option based upon organizational requirements.

Lessons

- Overview of the Enterprise Desktop Life Cycle
• Assessing Hardware and Infrastructure Readiness for a Desktop Deployment
• Using MAP to Assess Deployment Readiness
• Overview of Enterprise Desktop Deployment Methods
• Volume Activation Technologies for EnterpriseDesktops

Module 40: Planning An Image Management Strategy. This module describes Windows image formats and helps you to define an efficient image management strategy based upon business requirements.

Lessons

• Overview of Windows Image Format
• Overview of Image Management

Module 41: Implementing Desktop Security. This module describes how to deploy and manage a secure desktop by implementing centralized policies, BitLocker settings, and Encrypted File System (EFS) settings.

Lessons

• Implementing a Centralized Desktop Security Solution
• Planning and Implementing BitLocker
• Planning and Implementing EFS

Module 42: Capturing and Managing a Desktop Operating System Image. This module describes how to use the Windows Assessment and Deployment Kit (ADK) and Windows Deployment Services (WDS) to create, capture, and manage a desktop operating system image.

Lessons

• Overview of Windows ADK
• Managing Windows PE
• Building a Reference Image by Using Windows SIM and Sysprep
• Capturing and Servicing a Reference Image
• Configuring and Managing Windows DS

Module 43: Planning and Implementing User State Migration. This module describes how to use the User State Migration Tool (USMT) to migrate appropriate user data and settings to a new desktop operating system.
Lessons

- Overview of User State Migration
- Planning User State Migration by Using USMT
- Migrating User State by Using USMT

Module 44: Planning and Deploying Desktops Using the Microsoft Deployment Toolkit. This module describes how to use the Microsoft Deployment Toolkit (MDT) 2012 to deploy Windows operating systems in lite touch installation scenarios.

Lessons

- Planning for the LTI Environment
- Implementing MDT 2012 for LTI
- Integrating Windows DS with MDT

Module 44: Planning and Deploying Desktops by Using System Center 2012 Configuration Manager. This describes how to use System Center 2012 Configuration Manager to implement a zero touch installation for deploying enterprise desktops.

Lessons

- Planning the ZTI Environment
- Preparing the Site for Operating System Deployment
- Building a Reference Image by Using a Configuration Manager Task Sequence
- Deploying Client Images by Using MDT Task Sequences

Module 45: Planning and Implementing a Remote Desktop Services Infrastructure. This module describes how to plan and implement session virtualization deployment and a virtual desktop infrastructure (VDI) based upon Windows Server 2012 Remote Desktop Services.

Lessons

- Overview of Remote Desktop Services
- Planning the Remote Desktop Services Environment
- Configuring a Virtual Machine–Based Desktop Infrastructure Deployment
- Configuring a Session-Based Desktop Deployment
- Extending the Remote Desktop Services Environment to the Internet

Module 46: Managing User State Virtualization For Enterprise Desktops. This module describes how to plan and configure user state virtualization to provide a consistent desktop
client experience.

Lessons

- Overview of User State Virtualization
- Planning User State Virtualization
- Configuring Roaming Profiles, Folder Redirection, and Offline Files
- Implementing UE-V

Module 47: Planning and Implementing an Updates Infrastructure to Support Enterprise Desktops. Students will be able to plan and implement an updates infrastructure to support both physical and virtual enterprise desktops.

Lessons

- Planning an Updates Infrastructure for the Enterprise
- Supporting Software Updates with System Center 2012 Configuration Manager
- Managing Updates for Virtual Machines and Images
- Using Windows Intune for Managing Software Updates

Module 48: Protecting Enterprise Desktops from Malware and Data Loss. This module describes how to use System Center technologies such as Endpoint protection and Data Protection Manager (DPM) to protect enterprise desktops from malware and data loss.

Lessons

- Overview of System Center 2012 Endpoint Protection
- Configuring System Center 2012 Endpoint Protection Client Settings and Monitoring Status
- Using Windows Intune Endpoint Protection
- Protecting Desktops by Using DPM

Module 49: Monitoring the Performance and Health of the Desktop Infrastructure. This module describes how to identify and monitor relevant services and components to ensure the health and performance of the enterprise desktop infrastructure.

Lessons

- Performance and Health Monitoring for the Desktop Infrastructure Monitoring VDI
Module 50: Designing an Application Distribution Strategy. This module discusses the high-level aspects of designing an application distribution strategy. The topics covered can help students identify the aspects in an environment that influence application distribution and identify the most common distribution methods used in the Windows environment.

Lessons

- Developing an Application Lifecycle Strategy
- Determining Business Requirements for Application Distribution
- Overview of Application Distribution Strategies

Module 51: Diagnosing and Remediating Application Compatibility. This module describes the process for addressing common application compatibility issues experienced during a new operating system deployment. The module also explains how to use Microsoft Application Compatibility Toolkit (ACT) to help inventory, analyze, and mitigate application compatibility issues.

Lessons

- Diagnosing Application Compatibility Issues
- Evaluating and Implementing Remediation Solutions
- Resolving Compatibility Issues by Using ACT

Module 52: Deploying Software by Using Group Policy and Windows Intune. This module discusses using Group Policy and Windows Intune to deploy software as part of a software deployment strategy. It also covers side loading, which is the specialized software deployment method specific to Windows Store apps.

Lessons

- Deploying Software by Using Group Policy
- Side loading Windows Store Apps
- Deploying Software by Using Windows Intune

Module 53: Deploying Applications by Using Microsoft System Center 2012 Configuration Manager SP1. This module describes how to use System Center 2012 Configuration Manager SP1 to manage the software deployment and management lifecycle, including deploying software, targeting a group of user or computers, validating the success of software deployment, and removing software from computers when that software is no longer required.
Lessons

- Understanding Software Deployment by Using System Center 2012 Configuration Manager SP1
- Deploying Software by Using System Center 2012 Configuration Manager SP1

Module 54: Configuring Self-Service Application Deployment. This module describes planning, configuring and using self-service application deployment. It describes configuring self-service application deployment for Windows Intune clients and for Microsoft System Center 2012 Configuration Manager clients, in addition to using Microsoft System Center 2012 - Service Manager and Microsoft System Center 2012 - Orchestrator to improve the self-service application deployment process.

Lessons

- Understanding Self-Service Application Deployment
- Configuring Self-Service with Windows Intune
- Self-Service Deployment by Using System Center 2012 Configuration Manager SP1
- Self-Service Deployment with Service Manager and Orchestrator

Module 55: Designing and Implementing Presentation Virtualization Infrastructure. This module introduces you to presentation virtualization concepts and to the components that are used for presentation virtualization in computers running Windows so that you can plan the deployment of apps using presentation virtualization in your environment.

Lessons

- Assessing Presentation Virtualization Requirements
- Planning Presentation Virtualization Infrastructure
- Deploying Presentation Virtualization Infrastructure
- Extending the Presentation Virtualization Infrastructure

Module 56: Preparing, Configuring, and Deploying Presentation Virtualization Applications. This module discusses presentation virtualization strategies and which strategy to use in a given situation. It also discusses how to deploy applications to Remote Desktop Session Host servers as traditional, RemoteApp, and Remote Desktop Web Access applications.
Lessons

- Determining Presentation Virtualization Application Strategies
- Planning and Deploying Remote Desktop, RemoteApp, and Remote Desktop Web Acress

**Module 57: Designing and Deploying an Application Virtualization Environment.** This module discusses how to determine which application virtualization infrastructure model best suits an organization’s needs. Additionally, this module covers how to determine which Windows Server 2012 roles and features are needed to support the model you have selected, and which Group Policy settings should be configured.

Lessons

- Overview of Application Virtualization Models
- Deploying Application Virtualization Infrastructure Components
- Configuring Application Virtualization Client Support

**Module 58: Preparing, Sequencing, and Deploying Virtual Applications.** This module describes sequencing applications by using the Microsoft Application Virtualization (App-V) Sequencer. It also describes how to stream sequenced applications and how to locally install sequenced applications.

Lessons

- Sequencing Applications with App-V
- Deploying App-V Applications

**Module 59: Planning and Implementing Application Updates and Security.** This module discusses how to configure the appropriate infrastructure to streamline the deployment of software updates to applications. It also covers how to plan and configure application security.

Lessons

- Planning Application Updates
- Deploying Updates by Using WSUS
- Deploying Application Updates by Using System Center 2012 Configuration Manager SP1
• Implementing Application Security

**Module 60: Planning and Implementing Application Upgrades.** This module covers planning and implementing application upgrades and supersedence, including how to deploy multiple versions of an application, how to uninstall applications, how to retire applications, and how to manage user settings. It also covers planning application concurrency and implementing it by using App-V, Client Hyper-V, RemoteApp, VDI, and Remote Desktop Services.

**Lessons**

• Overview of Application Upgrades
• Overview of Application Concurrency

**Module 61: Monitoring Application Deployment, Use, and Performance.** This module describes using application monitoring as an essential part of managing applications in an enterprise environment. It also covers planning software inventory and metering, and monitoring application resource use.

**Lessons**

• Planning Application Monitoring
• Planning Software Inventory and Metering
• Monitoring Application Resource Utilization
MCSE Messaging Boot Camp

About this Course

The Microsoft Certified Solutions Expert (MCSE) Messaging boot camp provides IT professionals hands-on experience to develop their skills in planning, deploying, supporting, maintaining, and optimizing IT infrastructures. The MCSE: Messaging certification validates the knowledge and skills associated with performing as the lead engineer for messaging solutions within an enterprise organization, as well as the ability to design and deploy messaging solutions with Microsoft Exchange Server. Microsoft Exchange powers the new version of Office, making it easy for people to stay connected, access files any time, and maintain messaging security.

MCSE Candidate Profile

The MCSE Messaging validates your ability to move your company to the cloud, increase user productivity and flexibility, reduce data loss, and improve data security for your organization.

Earning an MCSE Messaging certification will qualify you for a position in network and computer systems administration.

Course Outline

Module 1: Preparing for Office 365

This module reviews the features of Office 365 and identifies recent improvements to the service. It then identifies the challenges in deploying Office 365 the benefits of the FastTrack approach compared to the traditional plan/prepare/migrate deployment process. After this, you examine how to plan the pilot, provision tenant accounts and finally, verify that clients can connect to the Office 365 service.

Lessons

- Introduction to Office 365
- Provisioning the Tenant Accounts
- Planning a Pilot
- Enabling Client Connectivity

Module 2: Managing Users, Groups, and Licenses

In this module, students learn about managing users, groups, and licenses by using the Office 365 console and Microsoft PowerShell.

Lessons
• Manage Users and Licenses by Using the Administration Center
• Manage Security and Distribution Groups
• Manage Cloud Identities with Windows PowerShell

Module 3: Administering Office 365
In this module, students learn about more complex administration functions, such as the management of administrators themselves, how to configure and set password policies in Office 365, and how to enable and administer rights management to protect confidential documents.

Lessons

• Manage Administrator Roles in Office 365
• Configure Password Management
• Administer Rights Management

Module 4: Planning and Managing Clients
In this module, students learn how to plan for client deployment and ensure that users get the tools they need to interact with Office 365 effectively. This module covers the planning process, how to make Office 365 ProPlus available to end-users directly, and how to deploy it as a managed package. Finally, this module covers how to set up Office telemetry so that administrators can keep track of how users are interacting with Microsoft Office.

Lessons

• Plan for Office Clients
• Manage User-driven Client Deployments
• Manage IT Deployments of Office 365 ProPlus
• Office Telemetry and Reporting

Module 5: Planning DNS and Exchange Migration
In this module, you learn about the factors that cover DNS domain configuration for Office 365, where you need to add the customer's existing domain or domains to Office 365. This module also covers the individual settings that you need to configure so that each Office 365 service works correctly and fully supports client access. These activities typically happen in the Deploy phase of the FastTrack process.

So far, you have been looking at Office 365 on its own. In this module, you move on to considering what you have to cover when migrating services from your on-premise environment, starting with your email system. This module addresses the key issues of migrating email accounts to Exchange Online and the planning involved in that process. In the lab, you will practice that planning and then carry out a cutover migration from your on-premises environment to Exchange Online.

Lessons

• Add and Configure Custom Domains
• Recommend a Mailbox Migration Strategy

Module 6: Planning Exchange Online and Configuring DNS Records
In this module, you learn about the factors that cover DNS domain configuration for Office 365, where you need to add the customer's existing domain or domains to Office 365. This module also covers the individual settings that you need to configure so that each Office 365 service works correctly and fully supports client
 access. These activities typically happen in the Deploy phase of the FastTrack process. This module also addresses the key issues of migrating email accounts to Exchange Online and the planning involved in that process.

Lessons

- Plan for Exchange Online
- Configure DNS Records for Services

Module 7: Administering Exchange Online
In this module, you learn how to configure Exchange Online settings that you planned in the previous module, including archive policies, anti-malware and anti-spam settings, additional email addresses and external contacts and resources. These are actions that you would typically carry out during the Deploy phase of the Office 365 FastTrack deployment or as part of the normal management operations of Exchange Online.

You typically carry out these actions through the Office 365 portal, although you can also use the Windows Azure Active Directory PowerShell console to access additional features.

Lessons

- Configure Personal Archive Policies
- Manage Anti-malware and Anti-spam Policies
- Configure Additional Email Addresses for Users
- Create and Manage External Contacts, Resources, and Groups

Module 8: Configuring SharePoint Online
In this module, students learn how to plan a SharePoint Online implementation that reflects the customer's needs and then create site collections that reflect those requirements. This module then covers the process of external user sharing with SharePoint Online and describes how this arrangement helps organizations share information more effectively.

Lessons

- Manage SharePoint Site Collections
- Configure External User Sharing
- Plan a Collaboration Solution

Module 9: Configuring Lync Online
In this module, students learn how to identify factors in the customer's environment that need to be reflected in the Lync Online deployment plan, then configure Lync Online to reflect the customer's business requirements, both at the end-user level and at the organization level.

Lessons

- Plan for Lync Online
- Configure Lync Online Settings
Module 10: Implementing Directory Synchronization
In this module, students learn how to plan, prepare and implement DirSync as a methodology for user and group management in an Office 365 deployment. The module covers the preparation of an on-premises environment, the installation and configuration of DirSync, and how to manage Active Directory users after DirSync has been enabled.

Lessons

- Prepare On-premises Active Directory for DirSync
- Set up DirSync
- Manage Active Directory Users and Groups with DirSync In Place

Module 11: Implementing Active Directory Federation Services.
In this module, students learn to plan for single sign-on (SSO) by using Active Directory Federation Services (AD FS) and then cover the process for setting up an AD FS server farm and an AD FS proxy. This module also cover the management process for certificates and the AD FS servers.

Lessons

- Planning for AD FS
- Install and Manage AD FS Servers
- Install and Manage AD FS Proxy Servers

Module 12: Monitoring Office 365.
In this module, students learn about monitoring user connections to Office 365 and how to cope with service outages. They look at a range of tools that diagnose service health and review the reports that Office 365 provides.

Lessons

- Isolate Service Interruption
- Monitor Service Health
- Analyze Reports

Module 13: Deploying and Managing Microsoft Exchange Server 2013
This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.

Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Module 13: Planning and Configuring Mailbox Servers.
This module describes how to plan and configure the Mailbox server role.

Lessons
• Overview of the Mailbox Server Role
• Planning the Mailbox Server Deployment
• Configuring the Mailbox Servers

Module 14: Managing Recipient Objects.
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

• Managing Exchange Server 2013 Mailboxes
• Managing Other Exchange Recipients
• Planning and Implementing Public Folder Mailboxes
• Managing Address Lists and Policies

Module 15: Planning and Deploying Client Access Servers.
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

• Planning Client Access Server Deployment
• Configuring the Client Access Server Role
• Managing Client Access Services

Module 16: Planning and Configuring Messaging Client Connectivity.
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

• Client Connectivity to the Client Access Server
• Configuring Outlook Web App
• Planning and Configuring Mobile Messaging
• Configuring Secure Internet Access for Client Access Server

Module 17: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

• High Availability on Exchange Server 2013
• Configuring Highly Available Mailbox Databases
• Configuring Highly Available Client Access Servers
Module 18: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 19: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 20: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 21: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
- Configuring Audit Logging

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
Module 23: Designing and Implementing Site Resilience.
This module explains how to design and implement site resilience for Exchange Server 2013.

Lessons

• Site Resilience and High Availability in Exchange Server 2013
• Planning a Site Resilient Implementation
• Implementing Site Resilience

This module explains how to plan a virtualization strategy for Exchange Server 2013 roles.

Lessons

• Planning a Hyper-V Deployment to Exchange Server 2013
• Virtualizing Exchange Server 2013 Server Roles

This module explains the basic concept of Unified Messaging in Exchange Server 2013.

Lessons

• Overview of Telephony Technologies
• Unified Messaging in Exchange Server 2013
• Unified Messaging Components

This module explains how to design and implement Exchange Server 2013 Unified Messaging.

Lessons

• Designing a Unified Messaging Deployment
• Deploying and Configuring Unified Messaging Components
• Designing and Implementing Exchange Server 2013 UM Integration with Lync Server 2013

This module explains how to design and implement message transport security.

Lessons

• Overview of Messaging Policy and Compliance Requirements
• Designing and Implementing Transport Compliance
• Designing and Implementing Active Directory Rights Management Services (AD RMS) Integration with Exchange Server 2013
Module 28: Designing and Implementing Message Retention.
This module explains how to design and implement message retention in Exchange Server 2013.

Lessons

- Overview of Messaging Records Management and Archiving
- Designing In-Place Archiving
- Designing and Implementing Message Retention

Module 29: Designing and Implementing Messaging Compliance.
This module explains how to design and implement messaging compliance.

Lessons

- Designing and Implementing Data Loss Prevention
- Designing and Implementing In-Place Hold
- Designing and Implementing In-Place eDiscovery

Module 30: Designing and Implementing Administrative Security and Auditing.
This module explains how to design and implement administrative security in an Exchange Server 2013 environment.

Lessons

- Designing and Implementing Role-Based Access Control (RBAC)
- Designing and Implementing Split Permissions
- Planning and Implementing Audit Logging

This module explains how to use Windows PowerShell 3.0 to manage Exchange Server 2013.

Lessons

- Overview of Windows PowerShell 3.0
- Managing Exchange Server Recipients by Using the Exchange Management Shell
- Using Windows PowerShell to Manage Exchange Server

Module 32: Designing and Implementing Integration with Microsoft Exchange Online.
This module explains how to design and implement integration with Exchange Online.

Lessons

- Planning for Exchange Online
- Planning and Implementing the Migration to Exchange Online
- Planning to Coexist with Exchange Online
Module 33: Designing and Implementing Messaging Coexistence.
This module explains how to design and implement messaging coexistence.

Lessons

- Designing and Implementing Federation
- Designing Coexistence Between Exchange Server Organizations
- Designing and Implementing Cross-Forest Mailbox Moves

Module 34: Designing and Implementing Exchange Server Upgrades.
This module explains how to design and implement upgrades from previous Exchange Server versions.

Lessons

- Planning the Upgrade from Previous Exchange Server Versions
- Implementing the Upgrade from Previous Exchange Versions
MCSE WINDOWS PRIVATE CLOUD BOOTCAMP

About this Course

The Microsoft Certified Solutions Expert (MCSE): Windows Server 2012 certification shows that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSE: Private Cloud certification will qualify you for such jobs as server administrator, systems programmer, and network manager.

MCSE Candidate Profile

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment.

MCSE: Private Cloud

The primary goal of this program is to help each student pass the exams required to earn the MCSE Windows Private Cloud. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons
- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons
- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons
- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons
- Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Introduction to the Private Cloud This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012.

Lessons

- Overview of the Cloud Computing Model
- Requirements for the Private Cloud
- Operating a Private Cloud Infrastructure with System Center
- Maintaining the Health of the Private Cloud
- Integrating System Center Components
- Verifying the Compliance of the Private Cloud Infrastructure

Lab: Verifying the Private Cloud Infrastructure

- Verifying the Infrastructure
- Verifying System Center Components
Lab: Verifying the Compliance of the Private Cloud Infrastructure

- Exercise: Checking Compliance

After completing this module, students will be able to:

- Describe the features of a cloud computing model.
- Describe the requirements for the private cloud.
- Describe how you can use System Center to monitor and manage the private cloud.
- Describe how to maintain the health of the private cloud infrastructure.
- Describe how to integrate System Center components.
- Verify the compliance of the private cloud infrastructure.

Module 40: Configuring and Optimizing Business Unit Clouds

This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons: Overview of System Center Virtual Machine Manager

- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Lab: Configuring and Optimizing Business Unit Clouds

- Configuring Network Resources
- Creating the Business Unit Cloud
- Configuring Security

After completing this module, students will be able to:

- Describe the core components, key features, architecture, and security features of Virtual Machine Manager, and the role it plays in the private cloud.
- Use Virtual Machine Manager to manage private cloud infrastructure.
- Describe how to build and configure resources and security for a business unit cloud.

Module 41: Deploying Cloud Services

This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons

- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
- Data-Tier Application Packages

**Lab : Importing and Deploying the Stock Trader Application**

- Deploying a Single Tier Service
- Configuring Prerequisites
- Preparing the Stock Trader Service Template
- Deploying the Service Template

After completing this module, students will be able to:

- Create service templates in VMM by using the Service Template Designer.
- Describe the process of creating VMM profiles.
- Describe the process of creating Web Deploy packages.
- Describe the process of sequencing by using Server App-V.
- Describe the process of creating data-tier application packages.

**Module 42: Monitoring Private Cloud Services** This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

**Lessons**

- Overview of System Center Operations Manager
- Agent Deployment in Operations Manager
- Configuring Custom Monitoring
- Monitoring the Network Infrastructure
- Monitoring Distributed Applications

**Lab : Monitoring Private Cloud Services**

- Deploying an Agent
- Configuring Custom Monitoring
- Creating a Distributed Application Model
- Detecting and Recovering from a Failure

After completing this module, students will be able to:

- Describe the key features of Operations Manager.
- Describe the architecture of Operations Manager, including databases, management servers, management server pools, consoles, gateways, and reporting.
• Describe how to secure access to Operations Manager by using User Roles.

Module 43: Configuring Application Performance Monitoring This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.

Lessons

• Application Performance Monitoring
• Advanced Monitoring in Application Performance Monitoring
• Viewing Application Performance in Operations Manager

Lab : Configuring Application Performance Monitoring

• Configuring Basic Monitoring in Application Performance Monitoring
• Customizing the Performance Thresholds
• Validating Monitoring
• Creating a Distributed Application Model for the Dinner Now Application

After completing this module, students will be able to:

• Describe the core components in APM and the best practices when implementing them.
• Describe how to implement advanced monitoring features that are available in APM.
• Describe how to view application performance in Operations Manager.

Module 44: Operating and Extending Service Management in the Private Cloud

This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes about the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

Lessons

• Overview of Service Manager
• Configuring Security and User Roles
• Configuring Work Items
- Configuring Incident Queues
- Configuring Service Offerings

**Lab : Operating and Extending Service Management in the Cloud**

- Configuring Security Roles
- Configuring Notifications
- Publishing an Incident Service Offering
- Raising an Incident
- Creating an Approving a Change Request
- Creating an Assigning a Release Record

After completing this module, students will be able to:

- Describe Service Manager.
- Describe configuring security and user roles.
- Describe configuring work items.
- Describe configuring incident queues.
- Describe configuring service offerings.

**Module 45: Automatic Incident Creation, Remediation, and Change Requests** This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

**Lessons**

- Overview of System Center Orchestrator 2012
- Integrating Orchestrator with Operations Manager and Service Manager

**Lab : Automating Incident Creation, Remediation, and Change Requests**

- Configuring the Incident Template
- Configuring Incidents That Affect the StockTrader Service
- Automating Incident Remediation and Change Requests

After completing this module, students will be able to:

- Describe the Orchestrator components and the available Integration Packs.
- Integrate Orchestrator with Operations Manager and Service Manager.

**Module 46: Problem Management in the Private Cloud** This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in
Operations Manager and then use it to identify and route incidents and problems to Service Manager.

**Lessons**

- Overview of Problem Management
- Creating Custom Rules

**Lab: Automating Problem Management in the Private Cloud**

- Manually Creating a Problem Record
- Creating a Custom Event Rule in Operations Manager
- Configuring Automated Problem Record Creation

After completing this module, students will be able to:

- Describe problem management.
- Create custom rules.

**Module 47: Automating Self-Service Provisioning**

This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

**Lessons**

- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

**Lab: Automating Self-Service Provisioning**

- Completing the Prerequisites for the System Center Cloud Services Process Pack
- Installing the System Center Cloud Services Process Pack
- Configuring the System Center Cloud Services Process Pack
- Deploying a Virtual Machine for StockTrader by using the Cloud Services Process Pack

After completing this module, students will be able to:

- Describe how to install and configure the System Center Cloud Services Process Pack.
- Describe the various Cloud Services configuration items that make up the System Center Cloud Service Process Pack.
• Describe the various Cloud Services request items that are included in the System Center Cloud Services Process Pack.

Module 48: Private Cloud Protection and Recovery This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database.

Lessons

• Protecting Data in the Private Cloud
• Recovering Data in the Private Cloud

Lab: Private Cloud Protection and Recovery

• Configuring Manual Protection and Recovery of Key Service Data
• Configuring Automatic Protection and Recovery of Key Service Data
• Monitoring Protection Status

After completing this module, students will be able to:

• Configure data protection in the private cloud.
• Configure data recovery in the private cloud.

Module 49: Configuring Compliance in the Private Cloud This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

Lessons

• Overview of the Process Pack for IT GRC
• Installing and Configuring the Process Pack for IT GRC
• Implementing an IT GRC Control Management Program
• Maintaining Compliance through VMM Security Baselines and System Center Advisor

Lab: Configuring Compliance in the Private Cloud

• Creating an IT GRC Control Management Program
• Adding Test Results to a Manual Control Activity and View Compliance Reports
Assigning a Baseline

After completing this module, students will be able to:

- Describe the System Center 2012 Process Pack for IT GRC.
- Describe installing and configuring the Process Pack for IT GRC.
- Describe implementing an IT GRC Control Management Program.
- Describe maintaining compliance by using VMM Security Baselines and System Center Advisor.

Module 50: Configuring SLAs, Dashboards, and Widgets

This module describes the various methods for surfacing service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

Lessons

- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
- System Center Analytics
- Using Excel and SSRS to View Data
- Overview of PerformancePoint

Lab: Configuring SLAs, Dashboards, and Widgets

- Configuring Service Level Tracking
- Configuring Service Level Management
- Configuring Microsoft Excel Analytics
- Configuring PerformancePoint Analytics

After completing this module, students will be able to:

- Describe Service Level Tracking in Microsoft System Center 2012 Operations Manager.
- Configure and deploy widgets and dashboards.
- Describe publishing in real time state with Microsoft Visio.
- Describe using System Center analytics.
- View data with Microsoft Office Excel and Microsoft SQL Server Reporting Services.
- Describe using Microsoft PerformancePoint.

Module 51: Planning for the Private Cloud

This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

Lessons
• Understanding the Private Cloud
• Requirements for Deploying a Private Cloud
• Designing the Private Cloud Infrastructure
• Overview of System Center 2012 Components
• Deploying Hyper-V Clustering with VMM

Lab : Planning for the Private Cloud

• Deploying the Virtual Machine Manager Agent
• Creating a Hyper-V Host Cluster Using VMM

After completing this module, students will be able to:

• Describe the private cloud.
• Describe the requirements for deploying a private cloud.
• Design a private cloud infrastructure.
• Describe the System Center 2012 components.
• Deploy Hyper-V clustering with VMM.

Module 52: Configuring and Deploying the Private Cloud with System Center 2012 -Virtual Machine Manager This module describes how to configure infrastructure components by using System Center 2012 - Virtual Machine Manager

Lessons

• Overview of VMM Architecture and Components
• Installing and Upgrading VMM
• Configuring VMM Security and Roles
• Understanding Host Groups

Lab : Configuring and Deploying the Private Cloud Infrastructure

• Reviewing and Configuring Hosts
• Configuring Host Groups
• Configuring User Roles and Run As Accounts
• Configuring the Library
• Preparing the Private Cloud Infrastructure
• Deploying a New Virtual Machine

After completing this module, students will be able to:

• Describe VMM architecture and components.
• Install and upgrade VMM.
• Configure VMM security and roles.
• Understand host groups.
Module 53: Extending and Maintaining the Private Cloud Infrastructure

This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons

- Overview of the PXE and Update Server Roles
- Deploying Bare-Metal Hyper-V Host Servers
- Configuring the Update Server Role
- Creating and Using an Update Baseline

Lab: Maintaining the Private Cloud Infrastructure

- Configuring a PXE Server in VMM
- Configuring a Host Profile
- Configuring an Update Server Role in VMM
- Configuring a Software Update Baseline in VMM

After completing this module, students will be able to:

- Describe how VMM integrates with WDS and WSUS to provide PXE and Update server roles.
- Describe how to deploy bare-metal Hyper-V host servers.
- Describe how to maintain updates within the VMM infrastructure.
- Configure the Update server role.
- Create and use a software update compliance baseline.

Module 54: Configuring Application Delivery

This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons

- Dynamic Application Deployment Overview
- Web Deployment Packages
- Server Application Virtualization Overview
- Configuring Server App-V Components
- Sequencing and Deploying Virtual Applications

Lab: Configuring Virtual Application Delivery

- Configuring the Server App-V Sequencer
- Configuring the Server App-V Agent
- Sequencing an Application
- Testing the Server App-V Package Deployment
After completing this module, students will be able to:

- Describe dynamic application deployment.
- Create web deployment packages by using the Web Deployment Tool.
- Describe server application virtualization.
- Configure the Server App-V agent and sequencer.
- Sequence and then test a Server App-V virtualized application.

**Module 55: Creating the Private Cloud Building Blocks** This module explains how to prepare and deploy the underlying infrastructure components that are used as building blocks for delivering private cloud services.

**Lessons**

- Configuring Guest Operating System Profiles
- Configuring Hardware Profiles
- Configuring SQL Server Using SQL Server Profiles
- Configuring Application Profiles
- Configuring Virtual Machine Templates
- Configuring the Self-Service User Role

**Lab : Creating the Private Cloud Building Blocks**

- Configuring Profiles
- Configuring Virtual Machine Templates
- Configuring a Service Template
- Configuring a User Role
- Deploying the StockTrader Application Service

After completing this module, students will be able to:

- Configure guest operating system profiles.
- Configure hardware profiles.
- Deploy SQL Server using SQL Server profiles.
- Configure application profiles for a deployment.
- Configure virtual machine templates.
- Configure the self-service user role.

**Module 56: Deploying and Accessing a Private Cloud** This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

**Lessons**

- Understanding Private Cloud Computing
- Installing and Configuring App Controller
- Creating and Managing Services and Service Templates
Lab : Deploying and Accessing a Private Cloud

- Creating and Configuring a Private Cloud
- Configuring App Controller
- Creating, Deploying and Managing Services

After completing this module, students will be able to:

- Describe private cloud computing.
- Install and configure App Controller.
- Create and manage services and service templates.

Module 57: Monitoring the Private Cloud Infrastructure This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons

- Operations Manager Architecture and Security
- Upgrading Operations Manager 2007 R2
- Configuring Notifications
- Configuring Management Packs
- Configuring Integration with System Center 2012

Lab : Monitoring the Private Cloud Infrastructure

- Deploying Agents
- Deploying and Configuring Monitoring Management Packs
- Configuring Notifications
- Configuring VMM Integration
- Configuring DPM Integration

After completing this module, students will be able to:

- Describe Operations Manager architecture and security considerations.
- Upgrade from Operations Manager 2007 R2 to System Center 2012 – Operations Manager.
- Describe the notification options available in Operations Manager.
- Install, configure, and upgrade management packs.
- Install and configure Operations Manager integration with VMM and DPM.

Module 58: Extending and Customizing Monitoring of the Private Cloud Infrastructure This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

Lessons

- Configuring the SharePoint Server Portal
- Monitoring Templates
- Distributed Application Monitoring

Lab: Extending and Customizing Monitoring

- Creating Custom Monitoring
- Creating a Distributed Application
- Configuring Service Level Management
- Creating Views for Private Cloud Infrastructure
- Configuring SharePoint Integration

After completing this module, students will be able to:

- Integrate Operations Manager data into a SharePoint portal.
- Describe how to use monitoring templates.
- Implement distributed application monitoring.

Module 59: Implementing Service Management for the Private Cloud
This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

Lessons

- Service Manager Architecture Overview
- Upgrading to System Center 2012 - Service Manager
- Understanding Service Manager Work Items
- Configuring Service Manager Connectors
- Configuring Service Manager Notifications

Lab: Implementing Service Management for the Private Cloud

- Configuring Service Manager Basic Settings
- Configuring Service Manager Connectors
- Configuring the Self-Service Portal
- Configuring Notifications

After completing this module, students will be able to:

- Setup and configure the core components of Service Manager.
- Plan an upgrade from Service Manager 2010 R2 to System Center 2012 - Service Manager.
- Describe the various work items and their relationships with each other.
- Configure the Service Manager connectors.
- Configure notifications.

Module 60: Protecting the Private Cloud Infrastructure
This module describes how to deploy and configure Data Protection Manager in a private cloud.
Lessons

- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

Lab : Protecting the Private Cloud Infrastructure

- Configuring the Storage Pool
- Deploying DPM Protection Agents
- Creating and Configuring Protection Groups
- Configuring SQL Server Self-Service Recovery
- Restoring Data from a SQL Server Protection Group
- Performing Self-Service Recovery to Recover SQL Server Data

After completing this module, students will be able to:

- Describe Data Protection Manager architecture and security considerations.
- Plan an upgrade from Data Protection Manager 2010 R2 to System Center 2012 - Data Protection Manager.
- Configure the components required to provide protection for the private cloud infrastructure.
- Configure protection of key applications within the private cloud infrastructure.
- Restore key applications within the private cloud infrastructure.

Module 61: Automating and Standardizing the Private Cloud

This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

Lessons

- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
- Managing Runbooks
- Configuring Integration Packs

Lab : Automating the Private Cloud

- Creating a Runbook Server and Configuring Integration Packs
- Configuring a Template to Deploy Agents on a New Virtual Machine
- Creating a Runbook to Protect All Resources on a Virtual Machine

After completing this module, students will be able to:
• Describe key components of System Center Orchestrator.
• Describe how to deploy and configure key Orchestrator components in a private cloud.
• Configure the System Center integration packs in Orchestrator.
• Create Runbooks.
• Configure Service Manager to execute Runbooks.

Module 62: Configuring the Cloud Services Process Pack This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons

• Implementing the Cloud Services Process Pack
• Service Level Management

Lab: Configuring the Cloud Service Process Pack

• Installing the Cloud Service Process Pack
• Configuring User Roles and Settings
• Configuring Service Offerings
• Creating an Incident Request
• Configuring Service Level Management

After completing this module, students will be able to:

• Describe the service catalog and how to implement it in Service Manager.
• Implement a Cloud Services Process Pack.
• Configure service request fulfillment.
• Configure service offerings.
• Use service level management.
MCSE Private Cloud Boot Camp

**Length:** 6 days  
**Audience:** IT Professionals  
**Technology:** Microsoft Windows Server 2012  
**Delivery Method:** Instructor-Led Classroom

### About this Course

This course describes how to monitor and operate a private cloud with Microsoft System Center 2012. This course focuses on how to manage and administer the private cloud, and it describes how you can monitor key infrastructure elements and applications that run within the private cloud. This course describes private cloud configuration and deployment with Microsoft System Center 2012.

### MCSE Candidate Profile

Data center administrators responsible for designing, installing and configuring a private cloud infrastructure. This boot camp is intended for students seeking to earn the MCSE Private Cloud 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

### MCSE Private Cloud

The primary goal of this program is to help each student pass the exams required to earn the MCSE Private Cloud 2012 certification. To do this, your knowledgeable instructor will blend lecture and practice exams to prepare you to pass each exam.

### Course Outline

**Module 1: Introduction to the Private Cloud.** This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012.

**Lessons**

- Overview of the Cloud Computing Model
- Requirements for the Private Cloud
- Operating a Private Cloud Infrastructure with System Center
- Maintaining the Health of the Private Cloud
- Integrating System Center Components
- Verifying the Compliance of the Private Cloud Infrastructure
Module 2: Configuring and Optimizing Business Unit Clouds. This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons
- Overview of System Center Virtual Machine Manager
- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Module 3: Deploying Cloud Services. This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons
- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
- Data-Tier Application Packages

Module 4: Monitoring Private Cloud Services. This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

Lessons
- Overview of System Center Operations Manager
- Agent Deployment in Operations Manager
- Configuring Custom Monitoring
- Monitoring the Network Infrastructure
- Monitoring Distributed Applications

Module 5: Configuring Application Performance Monitoring. This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.
Lessons
- Application Performance Monitoring
- Advanced Monitoring in Application Performance Monitoring
- Viewing Application Performance in Operations Manager

Module 6: Operating and Extending Service Management in the Private Cloud
This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes about the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

Lessons
- Overview of Service Manager
- Configuring Security and User Roles
- Configuring Work Items
- Configuring Incident Queues
- Configuring Service Offerings

Module 7: Automatic Incident Creation, Remediation, and Change Requests. This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

Lessons
- Overview of System Center Orchestrator 2012
- Integrating Orchestrator with Operations Manager and Service Manager

Module 8: Problem Management in the Private Cloud. This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in Operations Manager and then use it to identify and route incidents and problems to Service Manager.

Lessons
- Overview of Problem Management
- Creating Custom Rules

Module 9: Automating Self-Service Provisioning
This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

Lessons
- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

Module 10: Private Cloud Protection and Recovery. This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database.

Lessons
- Protecting Data in the Private Cloud
- Recovering Data in the Private Cloud

Module 11: Configuring Compliance in the Private Cloud. This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

Lessons
- Overview of the Process Pack for IT GRC
- Installing and Configuring the Process Pack for IT GRC
- Implementing an IT GRC Control Management Program
- Maintaining Compliance through VMM Security Baselines and System Center Advisor

Module 12: Configuring SLAs, Dashboards, and Widgets. This module describes the various methods for surfaced service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

Lessons
- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
Module 13: Planning for the Private Cloud. This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

Lessons
- Understanding the Private Cloud
- Requirements for Deploying a Private Cloud
- Designing the Private Cloud Infrastructure
- Overview of System Center 2012 Components
- Deploying Hyper-V Clustering with VMM

Module 14: Configuring and Deploying the Private Cloud with System Center 2012 -Virtual Machine Manager. This module describes how to configure infrastructure components by using System Center 2012 -Virtual Machine Manager

Lessons
- Overview of VMM Architecture and Components
- Installing and Upgrading VMM
- Configuring VMM Security and Roles
- Understanding Host Groups

Module 15: Extending and Maintaining the Private Cloud Infrastructure. This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons
- Overview of the PXE and Update Server Roles
- Deploying Bare-Metal Hyper-V Host Servers
- Configuring the Update Server Role
- Creating and Using an Update Baseline

Module 16: Configuring Application Delivery. This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons
• Dynamic Application Deployment Overview
• Web Deployment Packages
• Server Application Virtualization Overview
• Configuring Server App-V Components
• Sequencing and Deploying Virtual Applications

Module 17: Creating the Private Cloud Building Blocks. This module explains how to prepare and deploy
the underlying infrastructure components that are used as building blocks for delivering private cloud services.

Lessons
• Configuring Guest Operating System Profiles
• Configuring Hardware Profiles
• Configuring SQL Server Using SQL Server Profiles
• Configuring Application Profiles
• Configuring Virtual Machine Templates
• Configuring the Self-Service User Role

Module 18: Deploying and Accessing a Private Cloud. This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

Lessons
• Understanding Private Cloud Computing
• Installing and Configuring App Controller
• Creating and Managing Services and Service Templates

Module 19: Monitoring the Private Cloud Infrastructure. This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons
• Operations Manager Architecture and Security
• Upgrading Operations Manager 2007 R2
• Configuring Notifications
• Configuring Management Packs
• Configuring Integration with System Center 2012

Module 20: Extending and Customizing Monitoring of the Private Cloud Infrastructure.
This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

Lessons
- Configuring the SharePoint Server Portal
- Monitoring Templates
- Distributed Application Monitoring

Module 21: Implementing Service Management for the Private Cloud. This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

Lessons
- Service Manager Architecture Overview
- Upgrading to System Center 2012 - Service Manager
- Understanding Service Manager Work Items
- Configuring Service Manager Connectors
- Configuring Service Manager Notifications

Module 22: Protecting the Private Cloud Infrastructure. This module describes how to deploy and configure Data Protection Manager in a private cloud.

Lessons
- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

Module 23: Automating and Standardizing the Private Cloud. This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

Lessons
- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
• Managing Runbooks
• Configuring Integration Packs

Module 24: Configuring the Cloud Services Process Pack. This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons
• Implementing the Cloud Services Process Pack
• Service Level Management
• Use service level management.
MCSE WINDOWS PRIVATE CLOUD
BOOTCAMP

Length: 14 days
Audience: IT Professionals
Technology: Microsoft Windows Server 2012
Delivery Method: Instructor-Led Classroom

About this Course

The Microsoft Certified Solutions Expert (MCSE): Windows Server 2012 certification shows that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSE: Private Cloud certification will qualify you for such jobs as server administrator, systems programmer, and network manager.

MCSE Candidate Profile

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment.

MCSE: Private Cloud

The primary goal of this program is to help each student pass the exams required to earn the MCSE Windows Private Cloud. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

**Module 33: Implementing Active Directory Rights Management Services.** This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

**Lessons**

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

**Module 34: Implementing Active Directory Federation Services.** This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

**Lessons**

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

**Module 35: Implementing Network Load Balancing.** This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

**Lessons**

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

**Module 36: Implementing Failover Clustering.** This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

**Lessons**

- Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Introduction to the Private Cloud This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012. Lessons

- Overview of the Cloud Computing Model
- Requirements for the Private Cloud
- Operating a Private Cloud Infrastructure with System Center
- Maintaining the Health of the Private Cloud
- Integrating System Center Components
- Verifying the Compliance of the Private Cloud Infrastructure

Lab: Verifying the Private Cloud Infrastructure

- Verifying the Infrastructure
- Verifying System Center Components
Lab: Verifying the Compliance of the Private Cloud Infrastructure

- Exercise: Checking Compliance

After completing this module, students will be able to:

- Describe the features of a cloud computing model.
- Describe the requirements for the private cloud.
- Describe how you can use System Center to monitor and manage the private cloud.
- Describe how to maintain the health of the private cloud infrastructure.
- Describe how to integrate System Center components.
- Verify the compliance of the private cloud infrastructure.

Module 40: Configuring and Optimizing Business Unit Clouds This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons: Overview of System Center Virtual Machine Manager

- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Lab: Configuring and Optimizing Business Unit Clouds

- Configuring Network Resources
- Creating the Business Unit Cloud
- Configuring Security

After completing this module, students will be able to:

- Describe the core components, key features, architecture, and security features of Virtual Machine Manager, and the role it plays in the private cloud.
- Use Virtual Machine Manager to manage private cloud infrastructure.
- Describe how to build and configure resources and security for a business unit cloud.

Module 41: Deploying Cloud Services This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons

- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
• Data-Tier Application Packages

Lab : Importing and Deploying the Stock Trader Application

• Deploying a Single Tier Service
• Configuring Prerequisites
• Preparing the Stock Trader Service Template
• Deploying the Service Template

After completing this module, students will be able to:

• Create service templates in VMM by using the Service Template Designer.
• Describe the process of creating VMM profiles.
• Describe the process of creating Web Deploy packages.
• Describe the process of sequencing by using Server App-V.
• Describe the process of creating data-tier application packages.

Module 42: Monitoring Private Cloud Services This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

Lessons

• Overview of System Center Operations Manager
• Agent Deployment in Operations Manager
• Configuring Custom Monitoring
• Monitoring the Network Infrastructure
• Monitoring Distributed Applications

Lab : Monitoring Private Cloud Services

• Deploying an Agent
• Configuring Custom Monitoring
• Creating a Distributed Application Model
• Detecting and Recovering from a Failure

After completing this module, students will be able to:

• Describe the key features of Operations Manager.
• Describe the architecture of Operations Manager, including databases, management servers, management server pools, consoles, gateways, and reporting.
• Describe how to secure access to Operations Manager by using User Roles.

Module 43: Configuring Application Performance Monitoring
This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.

Lessons

• Application Performance Monitoring
• Advanced Monitoring in Application Performance Monitoring
• Viewing Application Performance in Operations Manager

Lab: Configuring Application Performance Monitoring

• Configuring Basic Monitoring in Application Performance Monitoring
• Customizing the Performance Thresholds
• Validating Monitoring
• Creating a Distributed Application Model for the Dinner Now Application

After completing this module, students will be able to:

• Describe the core components in APM and the best practices when implementing them.
• Describe how to implement advanced monitoring features that are available in APM.
• Describe how to view application performance in Operations Manager.

Module 44: Operating and Extending Service Management in the Private Cloud

This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes about the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

Lessons

• Overview of Service Manager
• Configuring Security and User Roles
• Configuring Work Items
• Configuring Incident Queues
• Configuring Service Offerings

Lab : Operating and Extending Service Management in the Cloud

• Configuring Security Roles
• Configuring Notifications
• Publishing an Incident Service Offering
• Raising an Incident
• Creating an Approving a Change Request
• Creating an Assigning a Release Record

After completing this module, students will be able to:

• Describe Service Manager.
• Describe configuring security and user roles.
• Describe configuring work items.
• Describe configuring incident queues.
• Describe configuring service offerings.

Module 45: Automatic Incident Creation, Remediation, and Change Requests

This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

Lessons

• Overview of System Center Orchestrator 2012
• Integrating Orchestrator with Operations Manager and Service Manager

Lab : Automating Incident Creation, Remediation, and Change Requests

• Configuring the Incident Template
• Configuring Incidents That Affect the StockTrader Service
• Automating Incident Remediation and Change Requests

After completing this module, students will be able to:

• Describe the Orchestrator components and the available Integration Packs.
• Integrate Orchestrator with Operations Manager and Service Manager.

Module 46: Problem Management in the Private Cloud

This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in
Operations Manager and then use it to identify and route incidents and problems to Service Manager.

**Lessons**

- Overview of Problem Management
- Creating Custom Rules

**Lab : Automating Problem Management in the Private Cloud**

- Manually Creating a Problem Record
- Creating a Custom Event Rule in Operations Manager
- Configuring Automated Problem Record Creation

After completing this module, students will be able to:

- Describe problem management.
- Create custom rules.

**Module 47: Automating Self-Service Provisioning**

This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

**Lessons**

- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

**Lab : Automating Self-Service Provisioning**

- Completing the Prerequisites for the System Center Cloud Services Process Pack
- Installing the System Center Cloud Services Process Pack
- Configuring the System Center Cloud Services Process Pack
- Deploying a Virtual Machine for StockTrader by using the Cloud Services Process Pack

After completing this module, students will be able to:

- Describe how to install and configure the System Center Cloud Services Process Pack.
- Describe the various Cloud Services configuration items that make up the System Center Cloud Service Process Pack.
• Describe the various Cloud Services request items that are included in the System Center Cloud Services Process Pack.

Module 48: Private Cloud Protection and Recovery

This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database.

Lessons

• Protecting Data in the Private Cloud
• Recovering Data in the Private Cloud

Lab: Private Cloud Protection and Recovery

• Configuring Manual Protection and Recovery of Key Service Data
• Configuring Automatic Protection and Recovery of Key Service Data
• Monitoring Protection Status

After completing this module, students will be able to:

• Configure data protection in the private cloud.
• Configure data recovery in the private cloud.

Module 49: Configuring Compliance in the Private Cloud

This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

Lessons

• Overview of the Process Pack for IT GRC
• Installing and Configuring the Process Pack for IT GRC
• Implementing an IT GRC Control Management Program
• Maintaining Compliance through VMM Security Baselines and System Center Advisor

Lab: Configuring Compliance in the Private Cloud

• Creating an IT GRC Control Management Program
• Adding Test Results to a Manual Control Activity and View Compliance Reports
Assigning a Baseline

After completing this module, students will be able to:

- Describe the System Center 2012 Process Pack for IT GRC.
- Describe installing and configuring the Process Pack for IT GRC.
- Describe implementing an IT GRC Control Management Program.
- Describe maintaining compliance by using VMM Security Baselines and System Center Advisor.

Module 50: Configuring SLAs, Dashboards, and Widgets
This module describes the various methods for surfacing service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

Lessons

- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
- System Center Analytics
- Using Excel and SSRS to View Data
- Overview of PerformancePoint

Lab: Configuring SLAs, Dashboards, and Widgets

- Configuring Service Level Tracking
- Configuring Service Level Management
- Configuring Microsoft Excel Analytics
- Configuring PerformancePoint Analytics

After completing this module, students will be able to:

- Describe Service Level Tracking in Microsoft System Center 2012 Operations Manager.
- Configure and deploy widgets and dashboards.
- Describe publishing in real time state with Microsoft Visio.
- Describe using System Center analytics.
- View data with Microsoft Office Excel and Microsoft SQL Server Reporting Services.
- Describe using Microsoft PerformancePoint.

Module 51: Planning for the Private Cloud
This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

Lessons
• Understanding the Private Cloud
• Requirements for Deploying a Private Cloud
• Designing the Private Cloud Infrastructure
• Overview of System Center 2012 Components
• Deploying Hyper-V Clustering with VMM

Lab : Planning for the Private Cloud

• Deploying the Virtual Machine Manager Agent
• Creating a Hyper-V Host Cluster Using VMM

After completing this module, students will be able to:

• Describe the private cloud.
• Describe the requirements for deploying a private cloud.
• Design a private cloud infrastructure.
• Describe the System Center 2012 components.
• Deploy Hyper-V clustering with VMM.

Module 52: Configuring and Deploying the Private Cloud with System Center 2012 -Virtual Machine Manager

This module describes how to configure infrastructure components by using System Center 2012 - Virtual Machine Manager

Lessons

• Overview of VMM Architecture and Components
• Installing and Upgrading VMM
• Configuring VMM Security and Roles
• Understanding Host Groups

Lab : Configuring and Deploying the Private Cloud Infrastructure

• Reviewing and Configuring Hosts
• Configuring Host Groups
• Configuring User Roles and Run As Accounts
• Configuring the Library
• Preparing the Private Cloud Infrastructure
• Deploying a New Virtual Machine

After completing this module, students will be able to:

• Describe VMM architecture and components.
• Install and upgrade VMM.
• Configure VMM security and roles.
• Understand host groups.
Module 53: Extending and Maintaining the Private Cloud Infrastructure This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons

- Overview of the PXE and Update Server Roles
- Deploying Bare-Metal Hyper-V Host Servers
- Configuring the Update Server Role
- Creating and Using an Update Baseline

Lab: Maintaining the Private Cloud Infrastructure

- Configuring a PXE Server in VMM
- Configuring a Host Profile
- Configuring an Update Server Role in VMM
- Configuring a Software Update Baseline in VMM

After completing this module, students will be able to:

- Describe how VMM integrates with WDS and WSUS to provide PXE and Update server roles.
- Describe how to deploy bare-metal Hyper-V host servers.
- Describe how to maintain updates within the VMM infrastructure.
- Configure the Update server role.
- Create and use a software update compliance baseline.

Module 54: Configuring Application Delivery This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons

- Dynamic Application Deployment Overview
- Web Deployment Packages
- Server Application Virtualization Overview
- Configuring Server App-V Components
- Sequencing and Deploying Virtual Applications

Lab: Configuring Virtual Application Delivery

- Configuring the Server App-V Sequencer
- Configuring the Server App-V Agent
- Sequencing an Application
- Testing the Server App-V Package Deployment
After completing this module, students will be able to:

- Describe dynamic application deployment.
- Create web deployment packages by using the Web Deployment Tool.
- Describe server application virtualization.
- Configure the Server App-V agent and sequencer.
- Sequence and then test a Server App-V virtualized application.

**Module 55: Creating the Private Cloud Building Blocks** This module explains how to prepare and deploy the underlying infrastructure components that are used as building blocks for delivering private cloud services.

**Lessons**

- Configuring Guest Operating System Profiles
- Configuring Hardware Profiles
- Configuring SQL Server Using SQL Server Profiles
- Configuring Application Profiles
- Configuring Virtual Machine Templates
- Configuring the Self-Service User Role

**Lab : Creating the Private Cloud Building Blocks**

- Configuring Profiles
- Configuring Virtual Machine Templates
- Configuring a Service Template
- Configuring a User Role
- Deploying the StockTrader Application Service

After completing this module, students will be able to:

- Configure guest operating system profiles.
- Configure hardware profiles.
- Deploy SQL Server using SQL Server profiles.
- Configure application profiles for a deployment.
- Configure virtual machine templates.
- Configure the self-service user role.

**Module 56: Deploying and Accessing a Private Cloud** This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

**Lessons**

- Understanding Private Cloud Computing
- Installing and Configuring App Controller
- Creating and Managing Services and Service Templates
Lab: Deploying and Accessing a Private Cloud

- Creating and Configuring a Private Cloud
- Configuring App Controller
- Creating, Deploying and Managing Services

After completing this module, students will be able to:

- Describe private cloud computing.
- Install and configure App Controller.
- Create and manage services and service templates.

Module 57: Monitoring the Private Cloud Infrastructure
This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons

- Operations Manager Architecture and Security
- Upgrading Operations Manager 2007 R2
- Configuring Notifications
- Configuring Management Packs
- Configuring Integration with System Center 2012

Lab: Monitoring the Private Cloud Infrastructure

- Deploying Agents
- Deploying and Configuring Monitoring Management Packs
- Configuring Notifications
- Configuring VMM Integration
- Configuring DPM Integration

After completing this module, students will be able to:

- Describe Operations Manager architecture and security considerations.
- Upgrade from Operations Manager 2007 R2 to System Center 2012 – Operations Manager.
- Describe the notification options available in Operations Manager.
- Install, configure, and upgrade management packs.
- Install and configure Operations Manager integration with VMM and DPM.

Module 58: Extending and Customizing Monitoring of the Private Cloud Infrastructure
This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

Lessons

- Configuring the SharePoint Server Portal
• Monitoring Templates
• Distributed Application Monitoring

Lab : Extending and Customizing Monitoring

• Creating Custom Monitoring
• Creating a Distributed Application
• Configuring Service Level Management
• Creating Views for Private Cloud Infrastructure
• Configuring SharePoint Integration

After completing this module, students will be able to:

• Integrate Operations Manager data into a SharePoint portal.
• Describe how to use monitoring templates.
• Implement distributed application monitoring.

Module 59: Implementing Service Management for the Private Cloud
This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

Lessons

• Service Manager Architecture Overview
• Upgrading to System Center 2012 - Service Manager
• Understanding Service Manager Work Items
• Configuring Service Manager Connectors
• Configuring Service Manager Notifications

Lab : Implementing Service Management for the Private Cloud

• Configuring Service Manager Basic Settings
• Configuring Service Manager Connectors
• Configuring the Self-Service Portal
• Configuring Notifications

After completing this module, students will be able to:

• Setup and configure the core components of Service Manager.
• Plan an upgrade from Service Manager 2010 R2 to System Center 2012 - Service Manager.
• Describe the various work items and their relationships with each other.
• Configure the Service Manager connectors.
• Configure notifications.

Module 60: Protecting the Private Cloud Infrastructure
This module describes how to deploy and configure Data Protection Manager in a private cloud.
Lessons

- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

Lab : Protecting the Private Cloud Infrastructure

- Configuring the Storage Pool
- Deploying DPM Protection Agents
- Creating and Configuring Protection Groups
- Configuring SQL Server Self-Service Recovery
- Restoring Data from a SQL Server Protection Group
- Performing Self-Service Recovery to Recover SQL Server Data

After completing this module, students will be able to:

- Describe Data Protection Manager architecture and security considerations.
- Plan an upgrade from Data Protection Manager 2010 R2 to System Center 2012 - Data Protection Manager.
- Configure the components required to provide protection for the private cloud infrastructure.
- Configure protection of key applications within the private cloud infrastructure.
- Restore key applications within the private cloud infrastructure.

Module 61: Automating and Standardizing the Private Cloud

This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

Lessons

- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
- Managing Runbooks
- Configuring Integration Packs

Lab : Automating the Private Cloud

- Creating a Runbook Server and Configuring Integration Packs
- Configuring a Template to Deploy Agents on a New Virtual Machine
- Creating a Runbook to Protect All Resources on a Virtual Machine

After completing this module, students will be able to:
• Describe key components of System Center Orchestrator.
• Describe how to deploy and configure key Orchestrator components in a private cloud.
• Configure the System Center integration packs in Orchestrator.
• Create Runbooks.
• Configure Service Manager to execute Runbooks.

Module 62: Configuring the Cloud Services Process Pack This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons

• Implementing the Cloud Services Process Pack
• Service Level Management

Lab: Configuring the Cloud Service Process Pack

• Installing the Cloud Service Process Pack
• Configuring User Roles and Settings
• Configuring Service Offerings
• Creating an Incident Request
• Configuring Service Level Management

After completing this module, students will be able to:

• Describe the service catalog and how to implement it in Service Manager.
• Implement a Cloud Services Process Pack.
• Configure service request fulfillment.
• Configure service offerings.
• Use service level management.
About this Course

The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

MCSE Candidate Profile

The MCSE certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

MCSE Server Infrastructure

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement
• Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

• Overview of Disaster Recovery
• Implementing Windows Server Backup
• Implementing Server and Data Recovery

Module 39: Planning a Server Upgrade and Migration. This module explains how to plan a server upgrade and migration strategy.

Lessons

• Upgrade and Migration Considerations
• Creating a Server Upgrade and Migration Plan
• Planning for Virtualization

Module 40: Planning and Implementing a Server Deployment Infrastructure. This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

• Selecting an Appropriate Server Imaging Strategy
• Selecting a Deployment Automation Strategy
• Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

**Module 46: Designing and Implementing an Active Directory Domain Services Topology.** This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

**Module 47: Planning and Implementing Storage.** This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

**Module 48: Planning and Implementing File Services.** This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

**Module 49: Designing and Implementing Network Access Services.** This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
• Planning Virtual Machine Configuration
• Preparing for Virtual Machine Deployments with VMM
• Deploying Virtual Machines

Module 55: Planning and Implementing a Virtualization Administration Solution. This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

Lessons

• Planning and Implementing Automation with System Center 2012
• Planning and Implementing System Center 2012 Administration
• Planning and Implementing Self-Service Options in System Center 2012

Module 56: Planning and Implementing a Server Monitoring Strategy. This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

Lessons

• Planning Monitoring in Windows Server 2012
• Overview of System Center Operations Manager
• Planning and Configuring Management Packs
• Planning and Configuration Notifications and Reporting
• Configuring Integration with VMM

Module 57: Planning and Implementing High Availability for File Services and Applications. This module explains how to plan and implement high availability for file services and applications.

Lessons

• Planning and Implementing Storage Spaces
• Planning and Implementing Distributed File System (DFS)
• Planning and Implementing Network Load Balancing (NLB)

Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering. This module explains how to plan and implement failover clustering.

Lessons

• Planning an Infrastructure for Failover Clustering
• Implementing Failover Clustering
• Integrating Failover Clustering with Server Virtualization
• Planning a Multisite Failover Cluster

Module 59: Planning and Implementing Server Update Infrastructure. This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

Lessons

• Planning and Implementing a WSUS Deployment
• Planning Software Updates with System Center 2012 Configuration Manager
• Planning and Implementing Updates in a Server Virtualization Infrastructure
• Planning and Implementing Virtual Machine Backup and Recovery

Module 60: Planning and Implementing a Business Continuity Strategy. This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

Lessons

• Overview of Business Continuity Planning
• Planning and Implementing Backup Strategies
• Planning and Implementing Recovery
• Planning and Implementing Backup and Recovery of Virtual Machines

Module 61: Planning and Implementing an Public Key Infrastructure. This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

Lessons

• Planning and Implementing Deployment of a Certification Authority
• Planning and Implementing Certificate Templates
• Planning and Implementing Certificate Distribution and Revocation
• Planning and Implementing Key Archival and Recovery

Module 62: Planning and Implementing an Identity Federation Infrastructure. This module describes how to plan and implement an identity federation infrastructure.

Lessons

• Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
• Planning and Implementing AD FS Claims Providers and Relying Parties
• Planning and Implementing AD FS Claims and Claim Rules

Module 63: Planning and Implementing an Information Rights Management Infrastructure. This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
MCSE Server Infrastructure Boot Camp Overview

**Day One:**

**Course 20410C: Installing and Configuring Windows Server 2012**

Module 1: Deploying and Managing Windows Server 2012

Module 2: Introduction to Active Directory Domain Services

Module 3: Managing Active Directory Domain Services Objects

Module 4: Automating Active Directory Domain Services Administration

Module 5: Implementing IPv4

Module 6: Implementing Dynamic Host Configuration Protocol

Module 7: Implementing DNS

**Day Two:**

Module 8: Implementing IPv6

Module 9: Implementing Local Storage

Module 10: Implementing File and Print Services

Module 11: Implementing Group Policy

Module 12: Securing Windows Servers Using Group Policy Objects

Module 13: Implementing Server Virtualization with Hyper-V

**Day Three:**

Review

Study Material

Exam 70-410

**Day Four:**

**Course 20411C: Administering Windows Server 2012**

Module 1: Configuring and Troubleshooting Domain Name System

Module 2: Maintaining Active Directory Domain Services
Module 3: Managing User and Service Accounts

Module 4: Implementing a Group Policy Infrastructure

Module 5: Managing User Desktops with Group Policy

Module 6: Configuring and Troubleshooting Remote Access

Module 7: Installing, Configuring, and Troubleshooting the Network Policy Server Role

Day Five:

Module 8: Implementing Network Access Protection

Module 9: Optimizing File Services

Module 10: Configuring Encryption and Advanced Auditing

Module 11: Deploying and Maintaining Server Images

Module 12: Implementing Update Management

Module 13: Monitoring Windows Server 2012

Day Six:

Review

Study Material

Exam 70-411

Day Seven:

Course 20412C: Configuring Advanced Windows Server 2012 Services

Module 1: Implementing Advanced Network Services

Module 2: Implementing Advanced File Services

Module 3: Implementing Dynamic Access Control

Module 4: Implementing Distributed AD DS Deployments

Module 5: Implementing AD DS Sites and Replication

Module 6: Implementing Active Directory Certificate Services

Day Eight:
Module 7: Implementing Active Directory Rights Management Services
Module 8: Implementing Active Directory Federation Services
Module 9: Implementing Network Load Balancing
Module 10: Implementing Failover Clustering
Module 11: Implementing Failover Clustering with Hyper-V
Module 12: Implementing Disaster Recovery

**Day Nine:**
Review
Study Material
Exam 70-412

**Day Ten:**

**Course 20413B: Designing and Implementing a Server Infrastructure**
Module 1: Planning a Server Upgrade and Migration
Module 2: Planning and Implementing a Server Deployment Infrastructure
Module 3: Designing and Maintaining an IP Configuration and Address Management Solution
Module 4: Designing and Implementing Name Resolution
Module 5: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure
Module 6: Designing and Implementing an Active Directory Organizational Unit Infrastructure
Module 7: Designing and Implementing a Group Policy Object Strategy
Module 8: Designing and Implementing an Active Directory Domain Services Topology

**Day Eleven:**
Module 9: Planning and Implementing Storage
Module 10: Planning and Implementing File Services
Module 11: Designing and Implementing Network Access Services
Module 12: Designing and Implementing Network Protection
Day Twelve:

Quick Study/Test 70-413 (if applicable)

Course 20414B: Implementing an Advanced Server Infrastructure

Module 1: Overview of Management in an Enterprise Data Center
Module 2: Planning and Implementing a Server Virtualization Strategy
Module 3: Planning and Implementing Networks and Storage for Virtualization
Module 4: Planning and Deploying Virtual Machines
Module 5: Planning and Implementing a Virtualization Administration Solution
Module 6: Planning and Implementing a Server Monitoring Strategy

Day Thirteen:

Module 7: Planning and Implementing High Availability for File Services and Applications
Module 8: Planning and Implementing a High Availability Infrastructure Using Failover Clustering
Module 9: Planning and Implementing Server Update Infrastructure
Module 10: Planning and Implementing a Business Continuity Strategy
Module 11: Planning and Implementing an Public Key Infrastructure
Module 12: Planning and Implementing an Identity Federation Infrastructure
Module 13: Planning and Implementing an Information Rights Management Infrastructure

Day Fourteen:

Course Evaluation

Review

Study Material

Test 70-414
About this Course

The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

MCSE Candidate Profile

The MCSE certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

MCSE Server Infrastructure

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
COURSE OUTLINE

- Deploying CAs
- Deploying and Configuring CA Hierarchy
- Deploying and Managing Certificate Templates
- Implementing Certificate Distribution and Revocation
- Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

- Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Planning a Server Upgrade and Migration. This module explains how to plan a server upgrade and migration strategy.

Lessons

- Upgrade and Migration Considerations
- Creating a Server Upgrade and Migration Plan
- Planning for Virtualization

Module 40: Planning and Implementing a Server Deployment Infrastructure. This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

- Selecting an Appropriate Server Imaging Strategy
- Selecting a Deployment Automation Strategy
- Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

**Module 46: Designing and Implementing an Active Directory Domain Services Topology.** This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

**Module 47: Planning and Implementing Storage.** This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

**Module 48: Planning and Implementing File Services.** This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

**Module 49: Designing and Implementing Network Access Services.** This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
Module 55: Planning and Implementing a Virtualization Administration Solution. This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

Lessons

- Planning and Implementing Automation with System Center 2012
- Planning and Implementing System Center 2012 Administration
- Planning and Implementing Self-Service Options in System Center 2012

Module 56: Planning and Implementing a Server Monitoring Strategy. This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

Lessons

- Planning Monitoring in Windows Server 2012
- Overview of System Center Operations Manager
- Planning and Configuring Management Packs
- Planning and Configuration Notifications and Reporting
- Configuring Integration with VMM

Module 57: Planning and Implementing High Availability for File Services and Applications. This module explains how to plan and implement high availability for file services and applications.

Lessons

- Planning and Implementing Storage Spaces
- Planning and Implementing Distributed File System (DFS)
- Planning and Implementing Network Load Balancing (NLB)

Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering. This module explains how to plan and implement failover clustering.

Lessons

- Planning an Infrastructure for Failover Clustering
- Implementing Failover Clustering
- Integrating Failover Clustering with Server Virtualization
Planning a Multisite Failover Cluster

Module 59: Planning and Implementing Server Update Infrastructure. This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

Lessons

- Planning and Implementing a WSUS Deployment
- Planning Software Updates with System Center 2012 Configuration Manager
- Planning and Implementing Updates in a Server Virtualization Infrastructure
- Planning and Implementing Virtual Machine Backup and Recovery

Module 60: Planning and Implementing a Business Continuity Strategy. This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

Lessons

- Overview of Business Continuity Planning
- Planning and Implementing Backup Strategies
- Planning and Implementing Recovery
- Planning and Implementing Backup and Recovery of Virtual Machines

Module 61: Planning and Implementing an Public Key Infrastructure. This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

Lessons

- Planning and Implementing Deployment of a Certification Authority
- Planning and Implementing Certificate Templates
- Planning and Implementing Certificate Distribution and Revocation
- Planning and Implementing Key Archival and Recovery

Module 62: Planning and Implementing an Identity Federation Infrastructure. This module describes how to plan and implement an identity federation infrastructure.

Lessons

- Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
- Planning and Implementing AD FS Claims Providers and Relying Parties
- Planning and Implementing AD FS Claims and Claim Rules

Module 63: Planning and Implementing an Information Rights Management Infrastructure. This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
MCSE Server Infrastructure

About this Course

The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

MCSE Candidate Profile

The MCSE certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

MCSE Server Infrastructure

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Superetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

- Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Planning a Server Upgrade and Migration. This module explains how to plan a server upgrade and migration strategy.

Lessons

- Upgrade and Migration Considerations
- Creating a Server Upgrade and Migration Plan
- Planning for Virtualization

Module 40: Planning and Implementing a Server Deployment Infrastructure. This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

- Selecting an Appropriate Server Imaging Strategy
- Selecting a Deployment Automation Strategy
- Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

**Module 46: Designing and Implementing an Active Directory Domain Services Topology.** This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

**Module 47: Planning and Implementing Storage.** This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

**Module 48: Planning and Implementing File Services.** This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

**Module 49: Designing and Implementing Network Access Services.** This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
- Planning Virtual Machine Configuration
- Preparing for Virtual Machine Deployments with VMM
- Deploying Virtual Machines

**Module 55: Planning and Implementing a Virtualization Administration Solution.** This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

**Lessons**

- Planning and Implementing Automation with System Center 2012
- Planning and Implementing System Center 2012 Administration
- Planning and Implementing Self-Service Options in System Center 2012

**Module 56: Planning and Implementing a Server Monitoring Strategy.** This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

**Lessons**

- Planning Monitoring in Windows Server 2012
- Overview of System Center Operations Manager
- Planning and Configuring Management Packs
- Planning and Configuration Notifications and Reporting
- Configuring Integration with VMM

**Module 57: Planning and Implementing High Availability for File Services and Applications.** This module explains how to plan and implement high availability for file services and applications.

**Lessons**

- Planning and Implementing Storage Spaces
- Planning and Implementing Distributed File System (DFS)
- Planning and Implementing Network Load Balancing (NLB)

**Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering.** This module explains how to plan and implement failover clustering.

**Lessons**

- Planning an Infrastructure for Failover Clustering
- Implementing Failover Clustering
- Integrating Failover Clustering with Server Virtualization
Planning a Multisite Failover Cluster

**Module 59: Planning and Implementing Server Update Infrastructure.** This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

**Lessons**
- Planning and Implementing a WSUS Deployment
- Planning Software Updates with System Center 2012 Configuration Manager
- Planning and Implementing Updates in a Server Virtualization Infrastructure
- Planning and Implementing Virtual Machine Backup and Recovery

**Module 60: Planning and Implementing a Business Continuity Strategy.** This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

**Lessons**
- Overview of Business Continuity Planning
- Planning and Implementing Backup Strategies
- Planning and Implementing Recovery
- Planning and Implementing Backup and Recovery of Virtual Machines

**Module 61: Planning and Implementing an Public Key Infrastructure.** This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

**Lessons**
- Planning and Implementing Deployment of a Certification Authority
- Planning and Implementing Certificate Templates
- Planning and Implementing Certificate Distribution and Revocation
- Planning and Implementing Key Archival and Recovery

**Module 62: Planning and Implementing an Identity Federation Infrastructure.** This module describes how to plan and implement an identity federation infrastructure.

**Lessons**
- Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
- Planning and Implementing AD FS Claims Providers and Relying Parties
- Planning and Implementing AD FS Claims and Claim Rules

**Module 63: Planning and Implementing an Information Rights Management Infrastructure.** This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
About this Course

This course will provide you with the knowledge and skills to plan, deploy, manage, secure, and support Microsoft Exchange Server 2013. This course will teach you how to configure Exchange Server 2013 and supply you with the information you will need to monitor, maintain, and troubleshoot Exchange Server 2013. This course will also provide guidelines, best practices, and considerations that will help you optimize performance and minimize errors and security threats in Exchange Server 2013.

MCSE Candidate Profile

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. They are not expected to have experience with previous Exchange Server versions.

At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Sever 2013.
- Plan for disaster mitigation, implement back up and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solutions, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Course Outline

Module 1: Deploying and Managing Microsoft Exchange Server 2013
This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.
Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Module 2: Planning and Configuring Mailbox Servers.
This module describes how to plan and configure the Mailbox server role.

Lessons

- Overview of the Mailbox Server Role
- Planning the Mailbox Server Deployment
- Configuring the Mailbox Servers

Module 3: Managing Recipient Objects,
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

- Managing Exchange Server 2013 Mailboxes
- Managing Other Exchange Recipients
- Planning and Implementing Public Folder Mailboxes
- Managing Address Lists and Policies

Module 4: Planning and Deploying Client Access Servers.
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

- Planning Client Access Server Deployment
- Configuring the Client Access Server Role
- Managing Client Access Services

Module 5: Planning and Configuring Messaging Client Connectivity.
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

- Client Connectivity to the Client Access Server
- Configuring Outlook Web App
- Planning and Configuring Mobile Messaging
- Configuring Secure Internet Access for Client Access Server
Module 6: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Module 7: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 8: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 9: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 10: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
• Configuring Audit Logging

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

• Monitoring Exchange Server 2013
• Maintaining Exchange Server 2013
• Troubleshooting Exchange Server 2013
About this Course

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At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Server 2013.
- Plan for disaster mitigation, implement back up and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solutions, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Course Outline

Module 1: Deploying and Managing Microsoft Exchange Server 2013

This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.
Lessons

• Exchange Server 2013 Prerequisites and Requirements
• Exchange Server 2013 Deployment
• Managing Exchange Server 2013

Module 2: Planning and Configuring Mailbox Servers.
This module describes how to plan and configure the Mailbox server role.

Lessons

• Overview of the Mailbox Server Role
• Planning the Mailbox Server Deployment
• Configuring the Mailbox Servers

Module 3: Managing Recipient Objects.
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

• Managing Exchange Server 2013 Mailboxes
• Managing Other Exchange Recipients
• Planning and Implementing Public Folder Mailboxes
• Managing Address Lists and Policies

Module 4: Planning and Deploying Client Access Servers.
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

• Planning Client Access Server Deployment
• Configuring the Client Access Server Role
• Managing Client Access Services

Module 5: Planning and Configuring Messaging Client Connectivity.
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

• Client Connectivity to the Client Access Server
• Configuring Outlook Web App
• Planning and Configuring Mobile Messaging
• Configuring Secure Internet Access for Client Access Server
Module 6: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Module 7: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 8: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 9: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 10: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
Advanced Solutions of Microsoft Exchange Server 2013
Course 20342

About this Course
This course will provide you with the knowledge and skills to configure and manage a Microsoft Exchange Server 2013 messaging environment. This course will teach you how to configure Exchange Server 2013, and it will provide guidelines, best practices, and considerations that will help you optimize your Exchange Server deployment.

MCSE Candidate Profile
This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. Students are expected to have experience with Exchange Server 2013 or with previous versions of Exchange Server.

At Course Completion
After completing this course, students will be able to:

- Design and implement site resiliency for Exchange Server 2013.
- Plan a virtualization strategy for Exchange Server 2013 roles.
- Design and implement message transport security.
- Design and implement message retention in Exchange Server 2013.
- Design and implement messaging compliance.
- Design and implement administrative security in an Exchange Server 2013 environment.
- Use the Windows PowerShell 3.0 command-line interface to manage Exchange Server 2013.
- Design and implement integration with Exchange Online.
- Design and implement messaging coexistence.
- Design and implement Exchange Server migrations from non-Exchange messaging systems, and upgrades from previous Exchange Server versions.

Course Outline

Module 1: Designing and Implementing Site Resilience.
This module explains how to design and implement site resilience for Exchange Server 2013.
Lessons

- Site Resilience and High Availability in Exchange Server 2013
- Planning a Site Resilient Implementation
- Implementing Site Resilience

**Module 2: Planning Virtualization for Microsoft Exchange Server 2013.**
This module explains how to plan a virtualization strategy for Exchange Server 2013 roles.

Lessons

- Planning a Hyper-V Deployment to Exchange Server 2013
- Virtualizing Exchange Server 2013 Server Roles

**Module 3: Overview of Exchange Server 2013 Unified Messaging.**
This module explains the basic concept of Unified Messaging in Exchange Server 2013.

Lessons

- Overview of Telephony Technologies
- Unified Messaging in Exchange Server 2013
- Unified Messaging Components

**Module 4: Designing and Implementing Exchange Server 2013 Unified Messaging.**
This module explains how to design and implement Exchange Server 2013 Unified Messaging.

Lessons

- Designing a Unified Messaging Deployment
- Deploying and Configuring Unified Messaging Components
- Designing and Implementing Exchange Server 2013 UM Integration with Lync Server 2013

**Module 5: Designing and Implementing Message Transport Security.**
This module explains how to design and implement message transport security.

Lessons

- Overview of Messaging Policy and Compliance Requirements
- Designing and Implementing Transport Compliance
- Designing and Implementing Active Directory Rights Management Services (AD RMS) Integration with Exchange Server 2013

**Module 6: Designing and Implementing Message Retention.**
This module explains how to design and implement message retention in Exchange Server 2013.

Lessons
• Overview of Messaging Records Management and Archiving
• Designing In-Place Archiving
• Designing and Implementing Message Retention

Module 7: Designing and Implementing Messaging Compliance.
This module explains how to design and implement messaging compliance.

Lessons

• Designing and Implementing Data Loss Prevention
• Designing and Implementing In-Place Hold
• Designing and Implementing In-Place eDiscovery

Module 8: Designing and Implementing Administrative Security and Auditing.
This module explains how to design and implement administrative security in an Exchange Server 2013 environment.

Lessons

• Designing and Implementing Role-Based Access Control (RBAC)
• Designing and Implementing Split Permissions
• Planning and Implementing Audit Logging

This module explains how to use Windows PowerShell 3.0 to manage Exchange Server 2013.

Lessons

• Overview of Windows PowerShell 3.0
• Managing Exchange Server Recipients by Using the Exchange Management Shell
• Using Windows PowerShell to Manage Exchange Server

Module 10: Designing and Implementing Integration with Microsoft Exchange Online.
This module explains how to design and implement integration with Exchange Online.

Lessons

• Planning for Exchange Online
• Planning and Implementing the Migration to Exchange Online
• Planning to Coexist with Exchange Online

Module 11: Designing and Implementing Messaging Coexistence.
This module explains how to design and implement messaging coexistence.

Lessons
Module 12: Designing and Implementing Exchange Server Upgrades.
This module explains how to design and implement upgrades from previous Exchange Server versions.

Lessons

• Planning the Upgrade from Previous Exchange Server Versions
• Implementing the Upgrade from Previous Exchange Server Versions
Advanced Solutions of Microsoft Exchange Server 2013
Course 20342

Length: 5 days
Audience: IT Professionals
Technology: Microsoft Exchange Server
Delivery Method: Instructor-Led Classroom

About this Course

This course will provide you with the knowledge and skills to configure and manage a Microsoft Exchange Server 2013 messaging environment. This course will teach you how to configure Exchange Server 2013, and it will provide guidelines, best practices, and considerations that will help you optimize your Exchange Server deployment.

MCSE Candidate Profile

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. Students are expected to have experience with Exchange Server 2013 or with previous versions of Exchange Server.

At Course Completion

After completing this course, students will be able to:

- Design and implement site resiliency for Exchange Server 2013.
- Plan a virtualization strategy for Exchange Server 2013 roles.
- Design and implement message transport security.
- Design and implement message retention in Exchange Server 2013.
- Design and implement messaging compliance.
- Design and implement administrative security in an Exchange Server 2013 environment.
- Use the Windows PowerShell 3.0 command-line interface to manage Exchange Server 2013.
- Design and implement integration with Exchange Online.
- Design and implement messaging coexistence.
- Design and implement Exchange Server migrations from non-Exchange messaging systems, and upgrades from previous Exchange Server versions.

Course Outline

Module 1: Designing and Implementing Site Resilience.
This module explains how to design and implement site resilience for Exchange Server 2013.
Lessons

- Site Resilience and High Availability in Exchange Server 2013
- Planning a Site Resilient Implementation
- Implementing Site Resilience

This module explains how to plan a virtualization strategy for Exchange Server 2013 roles.

Lessons

- Planning a Hyper-V Deployment to Exchange Server 2013
- Virtualizing Exchange Server 2013 Server Roles

This module explains the basic concept of Unified Messaging in Exchange Server 2013.

Lessons

- Overview of Telephony Technologies
- Unified Messaging in Exchange Server 2013
- Unified Messaging Components

This module explains how to design and implement Exchange Server 2013 Unified Messaging.

Lessons

- Designing a Unified Messaging Deployment
- Deploying and Configuring Unified Messaging Components
- Designing and Implementing Exchange Server 2013 UM Integration with Lync Server 2013

This module explains how to design and implement message transport security.

Lessons

- Overview of Messaging Policy and Compliance Requirements
- Designing and Implementing Transport Compliance
- Designing and Implementing Active Directory Rights Management Services (AD RMS) Integration with Exchange Server 2013

Module 6: Designing and Implementing Message Retention.
This module explains how to design and implement message retention in Exchange Server 2013.

Lessons
• Overview of Messaging Records Management and Archiving
• Designing In-Place Archiving
• Designing and Implementing Message Retention

Module 7: Designing and Implementing Messaging Compliance.
This module explains how to design and implement messaging compliance.

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This module explains how to design and implement administrative security in an Exchange Server 2013 environment.

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Lessons

• Overview of Windows PowerShell 3.0
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• Using Windows PowerShell to Manage Exchange Server

Module 10: Designing and Implementing Integration with Microsoft Exchange Online.
This module explains how to design and implement integration with Exchange Online.

Lessons

• Planning for Exchange Online
• Planning and Implementing the Migration to Exchange Online
• Planning to Coexist with Exchange Online

Module 11: Designing and Implementing Messaging Coexistence.
This module explains how to design and implement messaging coexistence.

Lessons
- Designing and Implementing Federation
- Designing Coexistence Between Exchange Server Organizations
- Designing and Implementing Cross-Forest Mailbox Moves

**Module 12: Designing and Implementing Exchange Server Upgrades.**
This module explains how to design and implement upgrades from previous Exchange Server versions.

**Lessons**

- Planning the Upgrade from Previous Exchange Server Versions
- Implementing the Upgrade from Previous Exchange Versions
Object-Oriented Analysis and Design Using UML

About this Course

This Object-Oriented Analysis and Design Using UML training teaches you how to effectively use object-oriented technologies and software modeling as applied to a software development process. Expert Oracle University instructors present one practical, complete, object-oriented analysis and design (OOAD) road map from requirements gathering to system design.

Audience Profile

System architects, software engineers, systems analysts and designers responsible for the conception and creation of object-oriented software applications will find the most value in taking this course. Architects responsible for the conception and creation of object-oriented software applications can also benefit from this educational investment.

At Course Completion

After completing this course, students will be able to:

- Describe the object-oriented software development process, including object-oriented methodologies and workflows
- Gather system requirements through interviews with stakeholders
- Analyze system requirements to determine the use cases and domain model of the problem domain (the Requirements model)
- Create a system architecture (the Architecture model) supporting the nonfunctional requirements (NFRs) and development constraints
- Create a system design (the Solution model) supporting the functional requirements (FRs)

Prerequisites

- Understand object-oriented concepts and methodology
- Demonstrate a general understanding of programming, preferably using the Java programming language
- Understand the fundamentals of the systems development process

Course Outline

Examining Object-Oriented Concepts and Terminology

- Describe the important object-oriented (OO) concepts
- Describe the fundamental OO terminology

Introducing Modeling and the Software Development Process

- Describe the Object-Oriented Software Development (OOSD) process
- Describe how modeling supports the OOSD process
Object-Oriented Analysis and Design Using UML

COURSE OUTLINE

- Describe the benefits of modeling software
- Explain the purpose, activities, and artifacts of the following OOSD workflows (disciplines): Requirements Gathering, Requirements Analysis, Architecture, Design, Implementation, Testing & Deployment

Creating Use Case Diagrams

- Justify the need for a Use Case diagram
- Identify and describe the essential elements in a UML Use Case diagram
- Develop a Use Case diagram for a software system based on the goals of the business owner
- Develop elaborated Use Case diagrams based on the goals of all the stakeholders
- Recognize and document use case dependencies using UML notation for extends, includes, and generalization
- Describe how to manage the complexity of Use Case diagrams by creating UML packaged views

Creating Use Case Scenarios and Forms

- Identify and document scenarios for a use case
- Create a Use Case form describing a summary of the scenarios in the main and alternate flows
- Describe how to reference included and extending use cases.
- Identify and document non-functional requirements (NFRs), business rules, risks, and priorities for a use case
- Identify the purpose of a Supplementary Specification Document

Creating Activity Diagrams

- Identify the essential elements in an Activity diagram
- Model a Use Case flow of events using an Activity diagram

Determining the Key Abstractions

- Identify a set of candidate key abstractions
- Identify the key abstractions using CRC analysis

Constructing the Problem Domain Model

- Identify the essential elements in a UML Class diagram
- Construct a Domain model using a Class diagram
- Identify the essential elements in a UML Object diagram
- Validate the Domain model with one or more Object diagrams

Transitioning from Analysis to Design using Interaction Diagrams

- Explain the purpose and elements of the Design model
- Identify the essential elements of a UML Communication diagram
- Create a Communication diagram view of the Design model
- Identify the essential elements of a UML Sequence diagram
- Create a Sequence diagram view of the Design model

Modeling Object State Using State Machine Diagrams

- Model object state
- Describe the essential elements of a UML State Machine diagram

Applying Design Patterns to the Design Model

- Define the essential elements of a software pattern
- Describe the Composite pattern
- Describe the Strategy pattern
- Describe the Observer pattern
- Describe the Abstract Factory pattern
### Introducing Architectural Concepts and Diagrams
- Distinguish between architecture and design
- Describe tiers, layers, and systemic qualities
- Describe the Architecture workflow
- Describe the diagrams of the key architecture views
- Select the Architecture type
- Create the Architecture workflow artifacts

### Introducing the Architectural Tiers
- Describe the concepts of the Client and Presentation tiers
- Describe the concepts of the Business tier
- Describe the concepts of the Resource and Integration tiers
- Describe the concepts of the Solution model

### Refining the Class Design Model
- Refine the attributes of the Domain model
- Refine the relationships of the Domain model
- Refine the methods of the Domain model
- Declare the constructors of the Domain model
- Annotate method behavior
- Create components with interfaces

### Overview of Software Development Processes
- Explain the best practices for OOSD methodologies
- Describe the features of several common methodologies
- Choose a methodology that best suits your project
- Develop an iteration plan

### Overview of Frameworks
- Define a framework
- Describe the advantages and disadvantages of using frameworks
- Identify several common frameworks
- Understand the concept of creating your own business domain frameworks

### Course Review
- Review the key features of object orientation
- Review the key UML diagrams
- Review the Requirements Analysis (Analysis) and Design workflows
Oracle Database 11g: Administration Workshop I

Course#: ORCL-1102
Exams: 1Z0-052

Length: 5 Days
Audience: Database Administrators, Developers
Type: Course
Delivery Method: Instructor-Led (Classroom)

About this Course

This Oracle Database 11g: Administration Workshop I course explores the fundamentals of basic database administration. Our expert instructors will reinforce topics with structured hands-on practices that will prepare you for the corresponding Oracle Certified Associate exam.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

You will also learn how to create an operational database and properly manage the various structures in an effective and efficient manner. This includes performance monitoring, database security, user management and backup/recovery techniques.

Course Objectives

- Install Oracle Grid Infrastructure
- Install and configure Oracle Database 11g
- Configure Oracle Net services
- Monitor and administer undo data
- Manage the database storage structures
- Create and administer user accounts
- Perform basic backup and recovery of a database
- Manage data concurrency
- Monitor performance
- Describe Oracle Database Architecture

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant
- Java Developer
Prerequisite

Oracle Introduction to SQL course or equivalent experience

At Course Completion

After completing this course, students will be able to:

- Install Oracle Grid Infrastructure.
- Create and manage users.
- Install and configure an Oracle Database.
- Create and manage storage structures.
- Administer the Oracle Database.
- Understand the Oracle database architecture and how its components work and interact with one another.
- Perform backup and recovery.

Course Outline

Exploring the Oracle Database Architecture

- Oracle Database Architecture Overview
- Oracle ASM Architecture Overview
- Process Architecture
- Memory structures
- Logical and physical storage structures
- ASM storage components

Installing your Oracle Software

- Tasks of an Oracle Database Administrator
- Tools Used to Administer an Oracle Database
- Installation: System Requirements
- Oracle Universal Installer (OUI)
- Installing Oracle Grid Infrastructure
- Installing Oracle Database Software
- Silent Install

Creating an Oracle Database

- Planning the Database
- Using the DBCA to Create a Database
- Password Management
- Creating a Database Design Template
- Using the DBCA to Delete a Database

Managing the Oracle Database Instance

- Start and stop the Oracle database and components
- Use Oracle Enterprise Manager
- Access a database with SQLPlus
- Modify database installation parameters
- Describe the stages of database startup
- Describe database shutdown options
- View the alert log
- Access dynamic performance views

Manage the ASM Instance

- Set up initialization parameter files for ASM instance
- Start up and shut down ASM instances
- Administer ASM disk groups

Configuring the Oracle Network Environment

- Use Enterprise Manager to create and configure the Listener
- Enable Oracle Restart to monitor the listener
- Use tnsping to test Oracle Net connectivity
- Identify when to use shared servers and when to use dedicated servers
Managing Database Storage Structures
- Storage Structures
- How Table Data Is Stored
- Anatomy of a Database Block
- Space Management in Tablespaces
- Tablespaces in the Preconfigured Database
- Actions with Tablespaces
- Oracle Managed Files (OMF)

Administering User Security
- Database User Accounts
- Predefined Administrative Accounts
- Benefits of Roles
- Predefined Roles
- Implementing Profiles

Managing Data Concurrency
- Data Concurrency
- Enqueue Mechanism
- Resolving Lock Conflicts
- Deadlocks

Managing Undo Data
- Data Manipulation
- Transactions and Undo Data
- Undo Data Versus Redo Data
- Configuring Undo Retention

Implementing Oracle Database Auditing
- Describe DBA responsibilities for security
- Enable standard database auditing
- Specify audit options
- Review audit information
- Maintain the audit trail

Database Maintenance
- Manage optimizer statistics
- Manage the Automatic Workload Repository (AWR)
- Use the Automatic Database Diagnostic Monitor (ADDM)

- Describe and use the advisory framework
- Set alert thresholds
- Use server-generated alerts
- Use automated tasks

Performance Management
- Performance Monitoring
- Managing Memory Components
- Enabling Automatic Memory Management (AMM)
- Automatic Shared Memory Advisor
- Using Memory Advisors
- Dynamic Performance Statistics
- Troubleshooting and Tuning Views
- Invalid and Unusable Objects

Backup and Recovery Concepts
- Part of Your Job
- Statement Failure
- User Error
- Understanding Instance Recovery
- Phases of Instance Recovery
- Using the MTTR Advisor
- Media Failure
- Archive Log Files

Performing Database Backups
- Backup Solutions: Overview
- Oracle Secure Backup
- User-Managed Backup
- Terminology
- Recovery Manager (RMAN)
- Configuring Backup Settings
- Backing Up the Control File to a Trace File
- Monitoring the Flash Recovery Area

Performing Database Recovery
- Opening a Database
- Data Recovery Advisor
- Loss of a Control File
- Loss of a Redo Log File
- Data Recovery Advisor
- Data Failures
• Listing Data Failures
• Data Recovery Advisor Views

Moving Data

• Describe ways to move data
• Create and use directory objects
• Use SQL*Loader to move data
• Use external tables to move data
• General architecture of Oracle Data Pump
• Use Data Pump export and import to move data

Working with Support

• Use the Enterprise Manager Support Workbench
• Work with Oracle Support
• Log service requests (SR)
• Manage patches
About this Course

This Oracle Database 11g: Administration Workshop I course explores the fundamentals of basic database administration. Our expert instructors will reinforce topics with structured hands-on practices that will prepare you for the corresponding Oracle Certified Associate exam.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

You will also learn how to create an operational database and properly manage the various structures in an effective and efficient manner. This includes performance monitoring, database security, user management and backup/recovery techniques.

Course Objectives

- Install Oracle Grid Infrastructure
- Install and configure Oracle Database 11g
- Configure Oracle Net services
- Monitor and administer undo data
- Manage the database storage structures
- Create and administer user accounts
- Perform basic backup and recovery of a database
- Manage data concurrency
- Monitor performance
- Describe Oracle Database Architecture

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant
- Java Developer
Prerequisite

Oracle Introduction to SQL course or equivalent experience

At Course Completion

After completing this course, students will be able to:

- Install Oracle Grid Infrastructure.
- Create and manage users.
- Install and configure an Oracle Database.
- Create and manage storage structures.
- Administer the Oracle Database.
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- Using the DBCA to Delete a Database

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- View the alert log
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- Space Management in Tablespaces
- Tablespaces in the Preconfigured Database
- Actions with Tablespaces
- Oracle Managed Files (OMF)

Managing Data Concurrency

- Data Concurrency
- Enqueue Mechanism
- Resolving Lock Conflicts
- Deadlocks

Managing Undo Data

- Data Manipulation
- Transactions and Undo Data
- Undo Data Versus Redo Data
- Configuring Undo Retention

Implementing Oracle Database Auditing

- Describe DBA responsibilities for security
- Enable standard database auditing
- Specify audit options
- Review audit information
- Maintain the audit trail

Database Maintenance

- Manage optimizer statistics
- Manage the Automatic Workload Repository (AWR)
- Use the Automatic Database Diagnostic Monitor (ADDM)

Performance Management

- Performance Monitoring
- Managing Memory Components
- Enabling Automatic Memory Management (AMM)
- Automatic Shared Memory Advisor
- Using Memory Advisors
- Dynamic Performance Statistics
- Troubleshooting and Tuning Views
- Invalid and Unusable Objects

Backup and Recovery Concepts

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- Statement Failure
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- Understanding Instance Recovery
- Phases of Instance Recovery
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Performing Database Backups

- Backup Solutions: Overview
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- User-Managed Backup
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Performing Database Recovery

- Opening a Database
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- Listing Data Failures
- Data Recovery Advisor Views

**Moving Data**

- Describe ways to move data
- Create and use directory objects
- Use SQL*Loader to move data
- Use external tables to move data
- General architecture of Oracle Data Pump
- Use Data Pump export and import to move data

**Working with Support**

- Use the Enterprise Manager Support Workbench
- Work with Oracle Support
- Log service requests (SR)
- Manage patches
Oracle Database 11g: Administration Workshop II
Course#: ORCL-1103
Exams: 1Z0-053

About this Course

This Oracle Database 11g: Administration Workshop II training takes the database administrator beyond the basic tasks covered in the first workshop. You'll begin by gaining a deep understanding of the most important responsibilities a DBA has: performing backup and recovery.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

Course Objectives

- Back and recover a database (and its parts) with RMAN (command-line and Enterprise Manager)
- Use flashback technology to view past states of data and to revert either objects or the entire database back to a past state
- Use an appropriate and flexible memory configuration for your database
- Identify burdensome database sessions and poorly performing SQL
- Configure the Oracle Database for optimal recovery
- Configure the database instance such that resources are appropriately allocated among sessions and tasks
- Schedule jobs to run inside or outside of the database
- Use compression to optimize database storage and duplicate a database

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant

Prerequisite

Oracle Introduction to SQL course or equivalent experience

Oracle Database 11G Administration Workshop I
At Course Completion

After completing this course, students will be able to:

- Diagnose and repair data failures with Flashback technology.
- Manage space to optimize database storage so you can respond to growing space requirements.
- Monitor and manage major database components, including memory, performance and resources.
- Secure the availability of your database through appropriate backup and recovery strategies.
- Automate DBA tasks with the Scheduler.

Course Outline

Core Concepts and Tools of the Oracle Database

- The Oracle Database Architecture: Overview
- ASM Storage Concepts
- Connecting to the Database and the ASM Instance
- DBA Tools Overview

Configuring for Recoverability

- Purpose of Backup and Recovery (B&R), Typical Tasks and Terminology
- Using the Recovery Manager (RMAN)
- Configuring your Database for B&R Operations
- Configuring Archivelog Mode
- Configuring Backup Retention
- Configuring and Using a Flash Recovery Area (FRA)

Creating Backups with RMAN

- RMAN backup types
- Creating and Using the following:
  - Backup Sets and Image Copies
  - Whole Database Backup
  - Fast Incremental Backup
  - Configure Backup Destinations
  - Duplexed Backup Sets
  - Archival Backups

Using the RMAN Recovery Catalog

- Tracking and Storing Backup Information
- Setting up a Recovery Catalog
- Recording Backups
- Using RMAN Stored Scripts
- Managing the Recovery Catalog (Backup, Export, Import, Upgrade, Drop and Virtual Private Catalog)

Configuring Backup Settings

- Configuring and Managing Persistent Settings for RMAN
- Configuring Autobackup of Control File
- Backup optimization
- Advanced Configuration Settings: Compressing Backups
- Configuring Backup and Restore for Very Large Files (Multisection)

Restore and Recovery Task

- Restoring and Recovering
- Causes of File Loss
- Automatic Tempfile Recovery
- Recovering from the Loss of a Redo Log Group
- Recovering from a Lost Index Tablespace
- Re-creating a Password Authentication File
- Complete and Incomplete Recovery
- Other Recovery Operations

Using RMAN to Perform Recovery

- Complete Recovery after Loss of a Critical or Noncritical Data File
• Recovering Image Copies and Switching Files
• Restore and Recovery of a Database in NOARCHIVELOG Mode
• Incomplete Recovery
• Performing Recovery with a Backup Control File
• Restoring from Autobackup: Server Parameter File and Control File
• Restoring and Recovering the Database on a New Host

Monitoring and Tuning RMAN

• Monitoring RMAN Jobs
• Balance Between Speed of Backup Versus Speed of Recovery
• RMAN Multiplexing
• Synchronous and Asynchronous I/O
• Explaining Performance Impact of MAXPIECESIZE, FILESPERSET, MAXOPENFILES and BACKUP DURATION

Diagnosing the Database

• Data Recovery Advisor (DRA)
• Block Corruption
• Automatic Diagnostic Repository (ADR)
• Health Monitor
• The ADR Command-Line Tool, ADRCI

Using Flashback Technology I

• Flashback Technology: Overview and Setup
• Using Flashback Technology to Query Data
• Flashback Table
• Flashback Transaction Query
• Performing Flashback Transaction Backout

Using Flashback Technology II

• Oracle Total Recall
• Flashback Drop and the Recycle Bin

Performing Flashback Database

• Configuring Flashback Database
• Performing Flashback Database Operations
• Monitoring Flashback Database

Managing Memory

• Oracle Memory Structures
• Oracle Database Memory Parameters
• Using Automatic Memory Management
• Automatic Shared Memory Management
• Using Memory Advisors
• Using Data Dictionary Views

Managing Database Performance

• Tuning Activities
• Using Statistic Preferences
• Optimizer Statistics Collection
• Monitor the Performance of Sessions and Services
• Automatic Workload Repository (AWR)
• Describing the Benefits of Database Replay

Managing Performance by SQL Tuning

• SQL Tuning and SQL Advisors
• Using SQL Tuning Advisor
• SQL Access Advisor
• SQL Performance Analyzer Overview

Managing Resources

• Database Resource Manager: Overview and Concepts
• Accessing and Creating Resource Plans
• Creating Consumer Group
• Specifying Resource Plan Directives, including:
  • - Limiting CPU Utilization at the Database Level
  • - Instance Caging
• Activating a Resource Plan
• Monitoring the Resource Manager

Automating Tasks with the Scheduler

• Simplifying Management Tasks
• Creating a Job, Program, and Schedule
• Using Time-Based, Event-Based, and Complex Schedules
• Describing the Use of Windows, Window Groups, Job Classes, and Consumer Groups
• Multi-Destination Jobs

Managing Space in Blocks

• Free Space Management
• Monitoring Space
• Compressing Data

Managing Space in Segments

• Segment Creation on Demand
• Additional Automatic Space-Saving Functionality
• Shrinking Segments
• Segment Advisor
• Managing Resumable Space Allocation

Managing Space for the Database

• Using 4 KB-Sector Disks
• Transporting Tablespaces
• Transporting Databases

Duplicating a Database

• Purpose and Methods of Cloning a Database
• Using RMAN to Create a Duplicate Database
• Cloning a Database from a Backup
• Duplicate a Database Based on a Running Instance
• Targetless Duplicating a Database
This Oracle Database 11g: Administration Workshop II training takes the database administrator beyond the basic tasks covered in the first workshop. You'll begin by gaining a deep understanding of the most important responsibilities a DBA has: performing backup and recovery.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

Course Objectives

- Back and recover a database (and its parts) with RMAN (command-line and Enterprise Manager)
- Use flashback technology to view past states of data and to revert either objects or the entire database back to a past state
- Use an appropriate and flexible memory configuration for your database
- Identify burdensome database sessions and poorly performing SQL
- Configure the Oracle Database for optimal recovery
- Configure the database instance such that resources are appropriately allocated among sessions and tasks
- Schedule jobs to run inside or outside of the database
- Use compression to optimize database storage and duplicate a database

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant

Prerequisite

Oracle Introduction to SQL course or equivalent experience

Oracle Database 11G Administration Workshop I
At Course Completion

After completing this course, students will be able to:

- Diagnose and repair data failures with Flashback technology.
- Manage space to optimize database storage so you can respond to growing space requirements.
- Monitor and manage major database components, including memory, performance and resources.
- Secure the availability of your database through appropriate backup and recovery strategies.
- Automate DBA tasks with the Scheduler.

Course Outline

Core Concepts and Tools of the Oracle Database

- The Oracle Database Architecture: Overview
- ASM Storage Concepts
- Connecting to the Database and the ASM Instance
- DBA Tools Overview

Configuring for Recoverability

- Purpose of Backup and Recovery (B&R), Typical Tasks and Terminology
- Using the Recovery Manager (RMAN)
- Configuring your Database for B&R Operations
- Configuring Archivelog Mode
- Configuring Backup Retention
- Configuring and Using a Flash Recovery Area (FRA)
- Configuring Autobackup of Control File
- Backup optimization
- Advanced Configuration Settings: Compressing Backups
- Configuring Backup and Restore for Very Large Files (Multisection)

Creating Backups with RMAN

- RMAN backup types
- Creating and Using the following:
  - Backup Sets and Image Copies
  - Whole Database Backup
  - Fast Incremental Backup
  - Configure Backup Destinations
  - Duplexed Backup Sets
  - Archival Backups

Restore and Recovery Task

- Restoring and Recovering
- Causes of File Loss
- Automatic Tempfile Recovery
- Recovering from the Loss of a Redo Log Group
- Recovering from a Lost Index Tablespace
- Re-creating a Password Authentication File
- Complete and Incomplete Recovery
- Other Recovery Operations

Using RMAN to Perform Recovery

- Complete Recovery after Loss of a Critical or Noncritical Data File

Using the RMAN Recovery Catalog

- Tracking and Storing Backup Information
- Setting up a Recovery Catalog
- Recording Backups
- Using RMAN Stored Scripts
- Managing the Recovery Catalog (Backup, Export, Import, Upgrade, Drop and Virtual Private Catalog)

Configuring Backup Settings

- Configuring and Managing Persistent Settings for RMAN
• Recovering Image Copies and Switching Files
• Restore and Recovery of a Database in NOARCHIVELOG Mode
• Incomplete Recovery
• Performing Recovery with a Backup Control File
• Restoring from Autobackup: Server Parameter File and Control File
• Restoring and Recovering the Database on a New Host

Monitoring and Tuning RMAN
• Monitoring RMAN Jobs
• Balance Between Speed of Backup Versus Speed of Recovery
• RMAN Multiplexing
• Synchronous and Asynchronous I/O
• Explaining Performance Impact of MAXPIECESIZE, FILESPERSET, MAXOPENFILES and BACKUP DURATION

Diagnosing the Database
• Data Recovery Advisor (DRA)
• Block Corruption
• Automatic Diagnostic Repository (ADR)
• Health Monitor
• The ADR Command-Line Tool, ADRCI

Using Flashback Technology I
• Flashback Technology: Overview and Setup
• Using Flashback Technology to Query Data
• Flashback Table
• Flashback Transaction Query
• Performing Flashback Transaction Backout

Using Flashback Technology II
• Oracle Total Recall
• Flashback Drop and the Recycle Bin

Performing Flashback Database
• Configuring Flashback Database

Managing Memory
• Oracle Memory Structures
• Oracle Database Memory Parameters
• Using Automatic Memory Management
• Automatic Shared Memory Management
• Using Memory Advisors
• Using Data Dictionary Views

Managing Database Performance
• Tuning Activities
• Using Statistic Preferences
• Optimizer Statistics Collection
• Monitor the Performance of Sessions and Services
• Automatic Workload Repository (AWR)
• Describing the Benefits of Database Replay

Managing Performance by SQL Tuning
• SQL Tuning and SQL Advisors
• Using SQL Tuning Advisor
• SQL Access Advisor
• SQL Performance Analyzer Overview

Managing Resources
• Database Resource Manager: Overview and Concepts
• Accessing and Creating Resource Plans
• Creating Consumer Group
• Specifying Resource Plan Directives, including:
  • - Limiting CPU Utilization at the Database Level
  • - Instance Caging
• Activating a Resource Plan
• Monitoring the Resource Manager

Automating Tasks with the Scheduler
• Simplifying Management Tasks
• Creating a Job, Program, and Schedule
• Using Time-Based, Event-Based, and Complex Schedules
• Describing the Use of Windows, Window Groups, Job Classes, and Consumer Groups
• Multi-Destination Jobs

Managing Space in Blocks

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• Targetless Duplicating a Database
Oracle Database 11g: Introduction to SQL
Course#: ORCL-1101
Exams: 1Z0-051

Length: Evenings - 4 Weeks
Audience: Database Administrators, Developers
Type: Course
Delivery Method: Instructor-Led (Classroom)

About this Course

This course offers students an introduction to Oracle Database 11g database technology. In this class students learn the concepts of relational databases and the SQL programming language. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, create database objects, and query meta data.

In addition, the advanced features of SQL needed to query and manipulate data within the database are taught. Schema objects that are useful for data warehousing and other application areas are discussed in detail. Students learn about manipulating large data sets and storing and retrieving dates according to different time zones.

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Forms Developers
- Portal Developers
- Business Intelligence Developers
- End Users
- Application Developers
- PL/SQL Developers

At Course Completion

After completing this course students will be able to:

- Retrieve row and column data from tables with the SELECT statement.
- Employ SQL functions to generate and retrieve customized data.
- Run data manipulation statements (DML) to update data in the Oracle Database 11g.
- Control user access and manage schema objects
- Search data using advanced sub queries

Prerequisites

Before attending this course, students must have:

- Familiarity with data processing concepts and techniques.
- Ability to use a graphical user interface (GUI).

Course Outline
Introducing Oracle Database 11g
- List the features of Oracle Database 11g
- Discuss the basic design, theoretical and physical aspects of a relational database
- Categorize the different types of SQL statements
- Describe the data set used by the course
- Log onto the database using the SQL Developer environment
- Save queries to files and use script files in SQL Developer

Retrieving Data Using the SQL SELECT Statement
- List the capabilities of SQL SELECT statements
- Generate a report of data from the output of a basic SELECT statement
  - Select All Columns
  - Select Specific Columns
  - Use Column Heading Defaults
  - Use Arithmetic Operators
  - Understand Operator Precedence
  - Learn the DESCRIBE command to display the table structure

Restricting and Sorting Data
- Write queries that contain a WHERE clause to limit the output retrieved
- List the comparison operators and logical operators that are used in a WHERE clause
- Describe the rules of precedence for comparison and logical operators
- Use character string literals in the WHERE clause
- Write queries that contain an ORDER BY clause sort the output of a SELECT statement
- Sort output in descending and ascending order

Using Single-Row Functions to Customize Output
- Describe the differences between single row and multiple row functions
- Manipulate strings with character function in the SELECT and WHERE clauses
- Manipulate numbers with the ROUND, TRUNC and MOD functions
- Perform arithmetic with date data
- Manipulate dates with the date functions

Using Conversion Functions and Conditional Expressions
- Describe implicit and explicit data type conversion
- Use the TO_CHAR, TO_NUMBER, and TO_DATE conversion functions
- Nest multiple functions
- Apply the NVL, NULLIF, and COALESCE functions to data
- Use conditional IF THEN ELSE logic in a SELECT statement

Reporting Aggregated Data Using the Group Functions
- Use the aggregation functions in SELECT statements to produce meaningful reports
- Create queries that divide the data in groups by using the GROUP BY clause
- Create queries that exclude groups of date by using the HAVING clause

Displaying Data From Multiple Tables
- Write SELECT statements to access data from more than one table
- View data that generally does not meet a join condition by using outer joins
- Join a table by using a self join

Using Sub-queries to Solve Queries
- Describe the types of problem that sub-queries can solve
- Define sub-queries
- List the types of sub-queries
- Write single-row and multiple-row sub-queries

Using the SET Operators
- Describe the SET operators
• Use a SET operator to combine multiple queries into a single query
• Control the order of rows returned when using the SET operators

**Manipulating Data**

• Describe each DML statement
• Insert rows into a table with the INSERT statement
• Use the UPDATE statement to change rows in a table
• Delete rows from a table with the DELETE statement
• Save and discard changes with the COMMIT and ROLLBACK statements
• Explain read consistency
• Using DDL Statements to Create and Manage Tables
• Categorize the main database objects
• Review the table structure
• List the data types available for columns
• Create a simple table
• Decipher how constraints can be created at table creation
• Describe how schema objects work

**Creating Other Schema Objects**

• Create a simple and complex view
• Retrieve data from views
• Create, maintain, and use sequences
• Create and maintain indexes
• Create private and public synonyms

**Controlling User Access**

• Differentiate system privileges from object privileges
• Grant privileges on tables
• View privileges in the data dictionary
• Grant roles
• Distinguish between privileges and roles

**Managing Schema Objects**

• Add constraints
• Create indexes
• Create indexes using the CREATE TABLE statement
• Create function-based indexes
• Drop columns and set column UNUSED
• Perform FLASHBACK operations
• Create and use external tables

**Managing Objects with Data Dictionary Views**

• Explain the data dictionary
• Find table information
• Report on column information
• View constraint information
• Find view information
• Verify sequence information
• Understand synonyms
• Add comments

**Manipulating Large Data Sets**

• Manipulate data using sub-queries
• Describe the features of multi-table inserts
• Use the different types of multi-table inserts
• Merge rows in a table
• Track the changes to data over a period of time

**Managing Data in Different Time Zones**

• Use data types similar to DATE that store fractional seconds and track time zones
• Use data types that store the difference between two date-time values
• Practice using the multiple data-time functions for globalize applications

**Retrieving Data Using Sub-queries**

• Write a multiple-column sub-query
• Use scalar sub-queries in SQL
• Solve problems with correlated sub-queries
• Update and delete rows using correlated sub-queries
• Use the EXISTS and NOT EXISTS operators
• Use the WITH clause

Regular Expression Support
• List the benefits of using regular expressions
• Use regular expressions to search for, match, and replace strings
Project Management Essentials

Course Specifications

Course length: 3.0 day(s)

Course Description

Course Objective: You will identify and apply generally recognized practices in project management.

Target Student: The target student for this course is any individual who may need to perform project management activities in their job role on either a formal or informal basis, or any project team members who want to enhance their knowledge of project management in order to interact more productively with a project manager and perform more effectively on a project team.

Prerequisites: Basic working knowledge of office productivity tools is required.

Course Objectives

Upon successful completion of this course, students will be able to:

- identify the basic concepts and terminology of professional project management.
- launch a project.
- estimate project work.
- create a project schedule.
- plan project costs.
- plan for project risks.
- plan for project quality and compliance.
- manage human resources for your project.
- manage project procurements.
- plan for change management and monitor the project scope.
- monitor and optimize project schedule and cost.
- monitor quality of project work and the risks involved.
- plan communication strategies and manage stakeholder relationships.
- perform project closure.

Course Content

Lesson 1: Getting Started with Project Management

  Topic 1A: Project Management Basics
  Topic 1B: Factors Influencing a Project

Lesson 2: Launching Projects

  Topic 2A: How Organizations Choose the Right Project
  Topic 2B: Identify Project Stakeholders and Their Expectations
  Topic 2C: Identify the Project Scope
  Topic 2D: Prepare a SOW
  Topic 2E: Formally Authorize a Project

Lesson 3: Estimating Project Work
Topic 3A: Estimate Project Effort and Resources Using Top-Down Estimation
Topic 3B: Estimate Project Effort and Resources Using Bottom-Up Estimation
Topic 3C: Reduce Risks in Project Estimates

Lesson 4: Creating a Project Schedule

Topic 4A: Illustrate Project Flow
Topic 4B: Identify Activity Resources
Topic 4C: Schedule Project Work

Lesson 5: Planning Project Costs

Topic 5A: Estimate Project Costs
Topic 5B: Establish the Cost Baseline
Topic 5C: Reconcile Funding and Costs

Lesson 6: Planning for Risks

Topic 6A: Create a Risk Management Plan
Topic 6B: Identify Risks and Their Causes
Topic 6C: Analyze Risks
Topic 6D: Develop a Risk Response Plan

Lesson 7: Planning for Quality and Compliance

Topic 7A: Deliver the Desired Project Results
Topic 7B: Verify Compliance Requirements

Lesson 8: Managing Human Resources

Topic 8A: Plan Your Dream Team
Topic 8B: Put the Team Together
Topic 8C: Build the Team
Topic 8D: Manage the Team

Lesson 9: Managing Project Procurements

Topic 9A: Plan for Project Procurements
Topic 9B: Obtain Responses from Vendors
Topic 9C: Choose the Right Vendor
Topic 9D: Manage Vendors and Procurements

Lesson 10: Managing Change During Project Execution

Topic 10A: Gear Up for Project Execution
Topic 10B: Manage Project Changes
Topic 10C: Monitor the Project Scope

Lesson 11: Monitoring and Controlling Project Schedule and Cost

Topic 11A: Monitor and Control the Project Schedule
Topic 11B: Optimize the Project Schedule
Topic 11C: Monitor and Control Project Costs

Lesson 12: Monitoring Risk and Quality

Topic 12A: Monitor and Control Risks
Topic 12B: Put Quality Plans into Action
Topic 12C: Control Project Quality

Lesson 13: Communicating and Reporting

Topic 13A: Communicate in a Project
Topic 13B: Distribute Project Information
Topic 13C: Manage Stakeholder Relationships and Expectations
Topic 13D: Report on Project Performance
Lesson 14: Closing the Project

**Topic 14A:** Hand Off the Project  
**Topic 14B:** Close Project Procurements  
**Topic 14C:** Wrap Up a Project

Appendix A: Project Management Templates
Course Objective

You will identify and apply generally recognized practices in project management.

Target Student

The target student for this course is any individual who may need to perform project management activities in their job role on either a formal or informal basis, or any project team members who want to enhance their knowledge of project management in order to interact more productively with a project manager and perform more effectively on a project team.

Course Objectives

- Upon successful completion of this course, students will be able to:
- identify the basic concepts and terminology of professional project management.
- launch a project.
- estimate project work.
- create a project schedule.
- plan project costs.
- plan for project risks.
- plan for project quality and compliance.
- manage human resources for your project.
- manage project procurements.
- plan for change management and monitor the project scope.
- monitor and optimize project schedule and cost.
- monitor quality of project work and the risks involved.
- plan communication strategies and manage stakeholder relationships.
- perform project closure.

Prerequisites

- Basic working knowledge of office productivity tools is required.
# Course Outline

## Lesson 1: Getting Started with Project Management

- **Topic 1A**: Project Management Basics
- **Topic 1B**: Factors Influencing a Project

## Lesson 2: Launching Projects

- **Topic 2A**: How Organizations Choose the Right Project
- **Topic 2B**: Identify Project Stakeholders and Their Expectations
- **Topic 2C**: Identify the Project Scope
- **Topic 2D**: Prepare a SOW
- **Topic 2E**: Formally Authorize a Project

## Lesson 3: Estimating Project Work

- **Topic 3A**: Estimate Project Effort and Resources Using Top-Down Estimation
- **Topic 3B**: Estimate Project Effort and Resources Using Bottom-Up Estimation
- **Topic 3C**: Reduce Risks in Project Estimates

## Lesson 4: Creating a Project Schedule

- **Topic 4A**: Illustrate Project Flow
- **Topic 4B**: Identify Activity Resources
- **Topic 4C**: Schedule Project Work

## Lesson 5: Planning Project Costs

- **Topic 5A**: Estimate Project Costs
- **Topic 5B**: Establish the Cost Baseline
- **Topic 5C**: Reconcile Funding and Costs

## Lesson 6: Planning for Risks

- **Topic 6A**: Create a Risk Management Plan
- **Topic 6B**: Identify Risks and Their Causes
- **Topic 6C**: Analyze Risks
- **Topic 6D**: Develop a Risk Response Plan

## Lesson 7: Planning for Quality and Compliance

- **Topic 7A**: Deliver the Desired Project Results
- **Topic 7B**: Verify Compliance Requirements

## Lesson 8: Managing Human Resources

- **Topic 8A**: Plan Your Dream Team
- **Topic 8B**: Put the Team Together
- **Topic 8C**: Build the Team
- **Topic 8D**: Manage the Team

## Lesson 9: Managing Project Procurements

- **Topic 9A**: Plan for Project Procurements
- **Topic 9B**: Obtain Responses from Vendors
- **Topic 9C**: Choose the Right Vendor
- **Topic 9D**: Manage Vendors and Procurements

## Lesson 10: Managing Change During Project Execution

- **Topic 10A**: Gear Up for Project Execution
- **Topic 10B**: Manage Project Changes
- **Topic 10C**: Monitor the Project Scope
<table>
<thead>
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<th>Lesson 13: Communicating and Reporting</th>
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<td><strong>Topic 11A:</strong> Monitor and Control the Project Schedule</td>
<td><strong>Topic 13A:</strong> Communicate in a Project</td>
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<td><strong>Topic 11B:</strong> Optimize the Project Schedule</td>
<td><strong>Topic 13B:</strong> Distribute Project Information</td>
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</tbody>
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About this Course

This course is designed for persons who have on the job experience performing project management tasks, whether or not project manager is their formal job role, who are not certified project management professionals, and who might or might not have received formal project management training. The course is appropriate for these persons if they wish to develop professionally, increase their project management skills, apply a formalized and standards-based approach to project management as well as seeking career advancement by moving into a formal project manager job role.

At the course completion

Upon successful completion of this course, students will be able to:

- Describe professional project management.
- Initiate a project.
- Plan project work.
- Develop project schedules.
- Develop cost estimates and budgets.
- Plan project quality, staffing, and communications.
- Analyze risks and plan risk responses.
- Plan project procurements.
- Execute project work.
- Manage project procurement.
- Monitor and control project work.
- Monitor and control project schedule and costs.
- Monitor and control project performance and quality.
- Monitor and control project risks and procurements.
- Close the project.

Prerequisites

Familiarity with project management concepts and some working experience with project management are required. Experience with a specific project management software tool is not required.

- Microsoft Word Level 1 is required.
- Project Management Fundamentals is recommended.
Lesson 1: Examining Professional Project Management
  • Identify Project Management Processes
  • Identify Professional and Social Responsibilities
  • Identify the Interpersonal Skills Required for a Project Manager

Lesson 2: Initiating a Project
  • Examine the Project Management Context
  • Examine Project Selection
  • Prepare a Project Statement of Work
  • Create a Project Charter
  • Identify Project Stakeholders

Lesson 3: Planning Project Work
  • Identify the Elements of a Project Management Plan
  • Document Stakeholder Requirements
  • Create a Scope Statement
  • Develop a Work Breakdown Structure

Lesson 4: Developing Project Schedules
  • Create an Activity List
  • Create a Project Schedule Network Diagram
  • Estimate Activity Resources
  • Estimate Duration for Project Activities
  • Develop a Project Schedule
  • Identify the Critical Path
  • Optimize the Project Schedule
  • Establish a Schedule Baseline

Lesson 5: Developing Cost Estimates and Budgets
  • Estimate Project Costs
  • Estimate the Cost Baseline
  • Reconcile Funding and Costs

Lesson 6: Planning Project Quality, Staffing, and Communications
  • Create a Quality Management Plan
  • Document the Project Roles, Responsibilities, and Reporting Relationships
  • Create a Communications Management Plan

Lesson 7: Analyzing Risks and Planning Risk Responses
  • Examine a Risk Management Plan
  • Identify Project Risks and Triggers
• Perform Qualitative Risk Analysis
• Perform Quantitative Risk Analysis
• Develop a Risk Response Plan

Lesson 8: Planning Project Procurements
• Plan Project Procurements
• Prepare a Procurement Statement of Work
• Prepare a Procurement Document

Lesson 9: Executing Project Work
• Identify the Direct and Manage Project Execution Process
• Execute a Quality Assurance Plan
• Acquire the Project Team
• Develop the Project Team
• Manage the Project Team
• Distribute Project Information
• Manage Stakeholder Relationships and Expectations

Lesson 10: Managing Project Procurement
• Examine the Conduct Procurements Process
• Obtain Responses from Sellers
• Determine Project Sellers

Lesson 11: Monitoring and Controlling Project Work
• Identify the Monitor and Control Project Work Process
• Develop an Integrated Change Control System
• Utilize the Integrated Change Control System
• Review Deliverables and Work Results
• Control the Project Scope

Lesson 12: Monitoring and Controlling Project Schedule and Costs
• Control the Project Schedule
• Control Project Costs

Lesson 13: Monitoring and Controlling Project Performance and Quality
• Perform Quality Control
• Report on Project Performance

Lesson 14: Monitoring and Controlling Project Risks and Procurements
• Monitor and Control Project Risks
• Administer Project Procurements
Lesson 15: Closing the Project

- Close Project Procurements
- Close the Project or Phase Administratively
This cutting-edge course teaches you how SIP provides a highly-scalable and cost-effective way to offer new and exciting telecommunication feature sets, helping you design your “next generation” network and develop new applications and software stacks. Other key topics include SIP as a key component in the Internet multimedia conferencing architecture, request and response messages, devices in a typical network, types of servers, SIP headers, comparisons with existing signaling protocols including H.323, related protocols SDP (Session Description Protocol) and RTP (Real-time Transport Protocol), and the future direction of SIP.

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   1.2 Internet Multimedia Protocol Stack
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   1.4 URLs, URIs, and URNs
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1.9 Conclusion

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2.6 Transport Protocol Selection
2.7 Conclusion

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4.2.1 SIP and SIPS URIs
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5.4.20 421 Extension Required
5.4.21 422 Session Timer Interval Too Small
5.4.22 423 Interval Too Brief
5.4.23 428 Use Identity Header
5.4.24 429 Provide Referer Identity
5.4.25 430 Flow Failed
5.4.26 433 Anonymity Disallowed
5.4.27 436 Bad Identity-Info Header
5.4.28 437 Unsupported Certificate
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5.4.30 439 First Hop Lacks Outbound Support
5.4.31 440 Max-Breadth Exceeded
5.4.32 470 Consent Needed
5.4.33 480 Temporarily Unavailable
5.4.34 481 Dialog/Transaction Does Not Exist
5.4.35 482 Loop Detected
5.4.36 483 Too Many Hops
5.4.37 484 Address Incomplete
5.4.38 485 Ambiguous
5.4.39 486 Busy Here
5.4.40 487 Request Terminated
5.4.41 488 Not Acceptable Here
5.4.42 489 Bad Event
5.4.43 491 Request Pending
5.4.44 493 Request Undecipherable
5.4.45 494 Security Agreement Required
5.5 Server Error
5.5.1 500 Server Internal Error
5.5.2 501 Not Implemented
5.5.3 502 Bad Gateway
5.5.4 503 Service Unavailable
5.5.5 504 Gateway Timeout
5.5.6 505 Version Not Supported
5.5.7 513 Message Too Large
5.5.8 580 Preconditions Failure
5.6 Global Error
5.6.1 600 Busy Everywhere
5.6.2 603 Decline
5.6.3 604 Does Not Exist Anywhere
5.6.4 606 Not Acceptable
5.7 Questions

6 SIP Header Fields
6.1 Request and Response Header Fields
6.1.1 Accept
6.1.2 Accept-Encoding
6.1.3 Accept-Language
6.1.4 Alert-Info
6.1.5 Allow
6.1.6 Allow-Events
6.1.7 Answer-Mode
6.1.8 Call-ID
6.1.9 Contact
6.1.10 CSeq
6.1.11 Date
6.1.12 Encryption
6.1.13 Expires
6.1.14 From
6.1.15 History Info
6.1.16 Organization
6.1.17 Path
6.1.18 Priv-Answer-Mode
6.1.19 Record-Route
6.1.20 Recv-Info
6.1.21 Refer-Sub
6.1.22 Retry-After
6.1.23 Subject
6.1.24 Supported
6.1.25 Timestamp
6.1.26 To
6.1.27 User-Agent
6.1.28 Via
6.2 Request Header Fields
6.2.1 Accept-Contact
6.2.2 Authorization
6.2.3 Call-Info
6.2.4 Event
6.2.5 Hide
6.2.6 Identity
6.2.7 Identity-Info
6.2.8 In-Reply-To
6.2.9 Info-Package
6.2.10 Join
6.2.11 Priority
6.2.12 Privacy
6.2.13 Proxy-Authorization
6.2.14 Proxy-Require
6.2.15 P-OSP-Auth-Token
6.2.16 P-Asserted-Identity
6.2.17 P-Preferred-Identity
6.2.18 Max-Breadth
6.2.19 Max-Forwards
6.2.20 Reason
6.2.21 Refer-To
6.2.22 Referred-By
6.2.23 Reply-To
6.2.24 Replaces
6.2.25 Reject-Contact
6.2.26 Request-Disposition
6.2.27 Require
6.2.28 Resource-Priority
6.2.29 Response-Key
6.2.30 Route
6.2.31 RACK
6.2.32 Security-Client
6.2.33 Security-Verify
6.2.34 Session-Expires
6.2.35 SIP-If-Match
6.2.36 Subscription-State
6.2.37 Suppress-If-Match
6.2.38 Target-Dialog
SIP: Understanding the Session Initiation Protocol
6.2.39 Trigger-Consent
6.3 Response Header Fields
6.3.1 Accept-Resource-Priority
6.3.2 Authentication-Info
6.3.3 Error-Info
6.3.4 Flow-Timer
6.3.5 Min-Expires
6.3.6 Min-SE
6.3.7 Permission-Missing
6.3.8 Proxy-Authenticate
6.3.9 Security-Server
6.3.10 Server
6.3.11 Service-Route
6.3.12 SIP-ETag
6.3.13 Unsupported
6.3.14 Warning
6.3.15 WWW-Authenticate
6.3.16 RSeq
6.4 Message Body Header Fields
6.4.1 Content-Encoding
6.4.2 Content-Disposition
6.4.3 Content-Language
6.4.4 Content-Length
6.4.5 Content-Type
6.4.6 MIME-Version

7 Wireless, Mobility, and IMS
7.1 IP Mobility
7.2 SIP Mobility
7.3 IMS and SIP
7.4 IMS Header Fields
7.5 Conclusion

8 Presence and Instant Messaging
8.1 Introduction
8.2 History of IM and Presence
8.3 SIMPLE
8.4 Presence with SIMPLE
8.4.1 SIP Events Framework
8.4.2 Presence Bodies
8.4.3 Resource Lists
8.4.4 Filtering
8.4.5 Conditional Event Notifications and ETags
8.4.6 Partial Publication
8.4.7 Presence Documents Summary
8.5 Instant Messaging with SIMPLE
8.5.1 Page Mode Instant Messaging
8.5.2 Common Profile for Instant Messaging
8.5.3 Instant Messaging Delivery Notification
8.5.4 Message Composition Indication
8.5.5 Multiple Recipient Messages
8.5.6 Session Mode Instant Messaging
8.6 Jabber
8.6.1 Standardization as Extensible Messaging and Presence Protocol
8.6.2 Interworking with SIMPLE
8.6.3 Jingle
8.6.4 Future Standardization of XMPP
8.7 Conclusion

9 Services in SIP
9.1 Gateway Services
9.2 SIP Trunking
9.3 SIP Service Examples
9.4 Voicemail
9.5 SIP Video
9vi SIP: Understanding the Session Initiation Protocol
9.6 Facsimile
9.7 Conferencing
9.7.1 Focus
9.7.2 Mixer
9.7.3 Non-SIP Conference Control
9.8 Application Sequencing
9.9 Other SIP Service Architectures
9.9.1 Service Oriented Architecture
9.9.2 Servlets
9.9.3 Service Delivery Platform
9.10 Conclusion

10 Network Address Translation
10.1 Introduction to NAT
10.2 Advantages of NAT
10.3 Disadvantages of NAT
10.4 How NAT Works
10.5 Types of NAT
10.5.1 Endpoint Independent Mapping NAT
10.5.2 Address Dependent Mapping NAT
10.5.3 Address and Port Dependent Mapping NAT
10.5.4 Hairpinning Support
10.5.5 IP Address Pooling Options
10.5.6 Port Assignment Options
10.5.7 Mapping Refresh
10.5.8 Filtering Modes
10.6 NAT Mapping Examples
10.7 NATs and SIP
10.8 Properties of a Friendly NAT or How a NAT Should BEHAVE
10.9 STUN Protocol
10.10 UNSAF Requirements
10.11 SIP Problems with NAT
10.11.1 Symmetric SIP
10.11.2 Connection Reuse
10.11.3 SIP Outbound
10.12 Media NAT Traversal Solutions
10.12.1 Symmetric RTP
10.12.2 RTCP Attribute
10.12.3 Self-Fixing Approach
10.13 Hole Punching
10.14 TURN: Traversal Using Relays Around NAT
10.15 ICE: Interactive Connectivity Establishment
10.16 Conclusion

11 Related Protocols
11.1 PSTN Protocols
11.1.1 Circuit Associated Signaling
11.1.2 ISDN Signaling
11.1.3 ISUP Signaling
11.2 SIP for Telephones
11.3 Media Gateway Control Protocols
11.4 H.323
11.4.1 Introduction to H.323
11.4.2 Example of H.323
11.4.3 Versions

12 Media Transport
12.1 Real-Time Transport Protocol (RTP)
12.2 RTP Control Protocol (RTCP)
12.2.1 RTCP Reports
12.2.2 RTCP Extended Reports
12.3 Compression
12.4 RTP Audio Video Profiles
12.4.1 Audio Codecs
Understanding the Session Initiation Protocol
12.4.2 Video Codecs
12.5 Conferencing
12.6 ToIP—Conversational Text
12.7 DTMF Transport

13 Negotiating Media Sessions
13.1 Session Description Protocol (SDP)
13.1.1 Protocol Version 291
13.1.2 Origin
13.1.3 Session Name and Information
13.1.4 URI
13.1.5 E-Mail Address and Phone Number
13.1.6 Connection Data
13.1.7 Bandwidth
13.1.8 Time, Repeat Times, and Time Zones
13.1.9 Encryption Keys
13.1.10 Media Announcements
13.1.11 Attributes
13.2 SDP Extensions
13.3 The Offer Answer Model
13.3.1 Rules for Generating an Offer
13.3.2 Rules for Generating an Answer
13.3.3 Rules for Modifying a Session
13.3.4 Special Case—Call Hold
13.4 Static and Dynamic Payloads
13.5 SIP Error Answer Exchanges
13.6 Conclusion
13.7 Questions

14 SIP Security
14.1 Basic Security Concepts
14.1.1 Encryption
14.1.2 Public Key Cryptography
14.1.3 Diffie-Hellman Cryptography
14.1.4 Message Authentication
14.1.5 Digital Certificates
14.2 Threats
14.3 Security Protocols
14.3.1 IPSec
14.3.2 TLS
14.3.3 DNSSEC
14.3.4 Secure MIME
14.4 SIP Security Model
14.4.1 SIP Digest Authentication
14.4.2 SIP Authentication Using TLS
14.4.3 Secure SIP
14.4.4 Identity
14.4.5 Enhanced SIP Identity
14.5 SIP Certificate Service
14.6 Media Security
14.6.1 Non-RTP Media
14.6.2 Secure RTP
14.6.3 Keying SRTP
14.6.4 Best Eff ort Encryption
14.6.5 ZRTP
14.7 Questions

15 Peer-to-Peer SIP
15.1 P2P Properties
15.2 P2P Properties of SIP
15.3 P2P Overlays
15.4 RELOAD
15.5 Host Identity Protocol
15.6 Conclusion

16 Call Flow Examples
16.1 SIP Call with Authentication, Proxies, and Record-Route
16.2 SIP Call with Stateless and Stateful Proxies with Called Party Busy
16.3 SIP to PSTN Call through Gateways
16.4 PSTN to SIP Call through a Gateway
16.5 Parallel Search
16.6 Call Setup with Two Proxies
16.7 SIP Presence and Instant Message Example

17 Future Directions
17.1 Bug Fixes and Clarifications
17.2 More Extensions
17.3 Better Identity
17.4 Interdomain SIP
17.5 Making Features Work Better
17.6 Emergency Calling
17.7 More SIP Trunking
17.8 P2P and HIP
17.9 Improved NAT Traversal
17.10 Security Deployment
17.11 Better Interoperability
TOGAF 9.1 Combined Level 1 & 2 Certification Course

About this Course

This course covers the latest TOGAF version, which is a part of the leading Open Group Enterprise Architecture standard. This course is independent of the vertical you work for: bank, manufacturer, retailer, aerospace, and government agency. There is a high demand in today’s market for Enterprise Architecture professionals. Join the 25,000+ certified TOGAF® professionals group.

This intensive course covers the entire syllabus for the TOGAF® 9.1 Foundation (Level 1) and Certified (Level 2) levels, preparing candidates for the TOGAF® 9.1 Level 1 and Level 2 examinations. The course is enhanced with case studies that demonstrate how TOGAF is applied in real organizations. Sample questions and answers for Level 1 and Level 2 examinations are given throughout the course to help better prepare students for their TOGAF 9.1 exams.

Prerequisite

There are no prerequisites for the course.

Target Audience

• Enterprise Architects
• Business Architects
• IT Architects
• Information Architects
• Technology Architects
• Application Architects
• System Integrators
• Solution Architects
• Data Architects
• Infrastructure Architects
• Security Architects and Technology Vendors.
• It would also benefit CIOs and CTOs, application portfolio managers, I.T. strategists, senior business analysts, Program Managers, Project Managers, Business Analysts, and others responsible for change programs.

At Course Completion

At the end of this course, you will learn:

• The logic of value-creation within the context of the ITIL Service Lifecycle
• Strategic assets of an organization and their performance potential for serving particular customers or market spaces (internal or external)
• Formal definitions of services suitable for planning and execution across the Service Lifecycle
• Service valuation, demand modeling, service provisioning and analysis, and business impact analysis
• Service Portfolio Management, methods, and processes related to service management and services
• High-level strategies for demand management that can be supported by capabilities across the Service Lifecycle
• How Service Strategy is driven through and informed by other elements of the Service Lifecycle
Architecture Development Method:

• Preliminary Phase

• Phase A – Architecture Vision

• Phase B – Business Architecture

• Phase C – Information Systems Architectures- Overview

• Phase C – Data Architecture

• Phase C – Application Architecture

• Phase D – Technology Architecture

• Phase E – Opportunities and Solutions

• Phase F – Migration Planning

• Phase G – Implementation Governance

• Phase H – Architecture Change Management

• Architecture Requirements Management

• Architecture Partitioning

• Adapting the ADM – Iteration and Levels

• Stakeholder Management

• Architecture Content Framework

• Architecture Benchmarking and Knowledge/Content Management

• Architecture Capability Framework
VMware vSphere V6.0

About this Course

This powerful 5-day class is an intensive introduction to VMware vSphere including VMware 6.0 and vCenter. Assuming no prior virtualization experience, this class starts with the basics and rapidly progresses to advanced topics. With hands-on labs, students learn the skills they need to become effective vSphere administrators.

Labs start with installation and configuration of stand-alone servers and progress to shared storage, networking and centralized management. The class continues to advanced topics including resource balancing, high availability, power management, back up and recovery, performance, vCenter redundancy, VM redundancy. Disaster recovery, rapid deployment, hot migration and workload consolidation are also covered.

This class is unique in its approach; which is to identify and eliminate common IT pain points using vSphere. By the end of the class, attendees will have learned the skills, and best practices of virtualization. Attendees will be able to design, implement, deploy, configure, monitor, manage and troubleshoot vSphere 6.0.

Who Should Attend

This class is suitable for anyone who wants to learn how to extract the maximum benefit from their investment in Virtual Infrastructure, including:

- **System architects** or others who need to design virtual infrastructure
- **Security specialists** responsible for administering, managing, securing Virtual Infrastructure
- **Operators** responsible for day-to-day operation of Virtual Infrastructure
- **Performance analysts** who need to understand, provision, monitor Virtual Infrastructure
- **Business Continuity specialists** responsible for disaster recovery and high availability
- **Storage administrators** who work with Fibre / iSCSI SAN volumes and NAS datastores
- **Managers** who need an unbiased understanding of virtualization before committing their organization to a virtual infrastructure deployment.

Prerequisites

Attendees should have user, operator or administrator experience on common operating systems such as Microsoft Windows®, Linux™, UNIX™, etc. Experience installing, configuring and managing operating systems, storage systems and or networks is useful but not required. We assume that all attendees have a basic familiarity with PC server hardware, disk partitioning, IP addressing, O/S installation, networking, etc.

Course Objectives
At the end of the course, attendees will be able to:

- Explain the many significant benefits of virtualization
- Install ESXi Server according to best practices
- Configure and manage local storage
- Create virtual, distributed virtual, and virtual to physical LAN segments
- Understand and use shared SAN storage including Fibre SAN, iSCSI SAN
- Define and use file share (NAS) datastores
- Install, configure and update the Platform Service Controller and vCenter Server Appliance
- Create and use Content Libraries to manage ISO repositories
- Create virtual machines, install operating systems and applications
- Configure and use hotplug hardware including hot-add vCPUs and Memory
- Add and grow virtual disks including system disks and secondary volumes
- Rapidly deployment of VMs using golden-master templates
- Create clones – one-time copies of virtual machine
- Perform VM cold migrations, hot migrations and Storage VMotion
- Configure, manage, monitor and secure users and groups
- Understand the benefits and tradeoffs of network attached storage and Fibre, iSCSI SANs
- Deploy and use VMware Replication to hot back up and recover critical Virtual Machines
- Create and manage load balanced clusters
- Enable, configure and use Distributed Power Management to reduce electrical power by soft powering off unneeded servers
- Understand, create and manage high availability clusters to protect against VM service loss caused by server failures
- Monitor and tune virtual machine performance
- Patch and update servers using vCenter Update Manager
- Understand how VMware and third party products, including operating systems, are impacted by virtualization
- Understand and use advanced vSwitch settings like NIC Teaming and Security
- Troubleshoot common problems

Course Outline

Chapter 1 – Virtualization Infrastructure Overview

- Virtualization explained
- How VMware virtualization compares to traditional PC deployments
- Common pain points in PC Server management
- How virtualization effectively addresses common IT issues
- VMware vSphere software products

Chapter 2 – How to Install, Configure ESXi 6.0 Installable

- Understanding ESXi
- Selecting, validating and preparing your server
- Storage controllers, disks and partitions
• Software installation and best practices
• Joining ESXi to a Domain
• Local User Management and Policies
• First look at the VMware vSphere Client

Chapter 3 – Virtual and Physical Networking
• vNetwork standard and distributed virtual Switches
• Virtual Switches, Ports and Port Groups
• Creating VMkernel ports
• Creating, sizing and customizing Virtual Switches

Chapter 4 – Content Libraries & NAS Shared Storage
• Benefits Shared Storage offer to Virtual Infrastructure
• Shared Storage options
• NFS Overview
• Configuring ESX to use NFS Shares
• Configuring NFS for performance and redundancy
• NFS Use Cases
• Troubleshooting NFS connections

Chapter 5 – Virtual Hardware and Virtual Machines
• VM virtual hardware, options and limits
• Sizing and creating a new VM
• Assigning, modifying and removing Virtual Hardware
• Working with a VM’s BIOS
• VMware remote console applications
• Installing an OS into a VM
• Driver installation and customization

Chapter 6 – vCenter Server and the Next Generation Web Client
• The need for Identity Source management
• Installing the Platform Service Controller
• Installing and configuring vCenter Server Appliance
• Connecting Single Sign On (SSO) to Active Directory and other identity sources
• vCenter feature overview and components
• Organizing vCenter’s inventory views
• Importing ESX hosts into vCenter management
• Installing and Using the vSphere Next Generation Web Client

Chapter 7 – VM Rapid Deployment using Templates, Clones
• Templates – Virtual Machine Golden Master images
• Creating, modifying, updating and working with Templates
• Patching, and refreshing Templates
• Cloning, one time copies of VMs
• Best practices for cloning and templating
• Adding and resizing virtual disks

Chapter 8 – ESXi and vCenter Permission Model
• VMware Security model
• Configuring local users and groups
• Managing local permissions
• vCenter security model
• Local, Domain and Active Directory users and groups
• How permissions are applied

Chapter 9 – Using Fibre and iSCSI Shared Storage
• Fibre SAN overview
• Identifying and using Fibre Host Bus Adapters
• Scanning and Rescanning Fibre SANs
• iSCSI overview
• Virtual and physical iSCSI adapters
• Connecting to iSCSI storage
• Scanning and rescanning iSCSI SANS
• Performance and redundancy considerations and best practices
• Understanding the benefits of VMware VAAI compliant storage

Chapter 10 – VMware File System (VMFS)
• Unique file system properties of VMFS
• Managing shared Volumes
• Creating new VMFS partitions
• Managing VMFS capacity with LUN spanning and LUN expansion
• Native and 3rd party Multipathing with Fibre and iSCSI SANs
• VMFS performance considerations
• VMFS scalability and reliability

Chapter 11 – ESX and vCenter Alarms
• Alarm categories and definitions
• Creating custom alarms and actions
• Reviewing alarms and acknowledging them

Chapter 12 – Resource Management and Resource Pools
• How ESX delivers resources to VMs
• Shares, Reservations and Limits
• CPU resource scheduling
• Memory resource scheduling
• Resource Pools
Chapter 13 – Consolidation with VMware Converter Standalone
- vCenter Converter overview
- Converting physical machines, virtual machines and OS Images
- Cold migrations of physical machines to virtual machines
- Hot migrations of physical machines to virtual machines

Chapter 14 – VM Hot and Cold Migration, Storage VMotion
- Cold Migrations to new ESX hosts, datastores
- Hot Migrations with VMotion
- VMotion requirements and dependencies
- How VMotion works – detailed explanation
- Troubleshooting VMotion
- Storage VMotion for hot VM disk migrations

Chapter 15 – Distributed Resource Scheduling Clusters
- Delegated resource management with Resource Pools
- Resource balanced clusters with VMware Distributed Resource Scheduler
- DRS Cluster configuration and tuning
- Per-VM cluster policy overrides
- Learn the features and benefits of DRS Power Management

Chapter 16 – Failure Recovery with High Availability Clusters
- High Availability options to minimize unplanned down time
- VMware High Availability clusters
- VMware Fault Tolerance

Chapter 17 – Hot VM Protection with vSphere Replication
- Explain vSphere Replication features and Use Cases
- Import the vSphere Replication virtual appliance
- Configure vSphere Replication including Recovery Point Objectives (RPOs)
- Enable vSphere Replication on a VM
- Recover a VM using vSphere Replication

Chapter 18 – Patch Management with VMware Update Manager
- Configure and enable VMware Update Manager
- Establishing a patch baseline
- Verifying compliance and patching ESXi hosts

Chapter 19 – Managing Scalability and Performance
- VMkernel CPU and memory resource management mechanisms
- Tuning VM storage I/O performance
- Identifying and resolving resource contention
- Monitoring VM and ESX host performance
• Performance and capacity planning strategies

Chapter 20 – Final Thoughts
• Consolidation guidelines for VMs and Storage
• Determining which workloads to consolidate
• Other considerations
The Developing Applications for the Java(TM) EE Platform course provides students with the knowledge to build and deploy enterprise applications that comply with Java(TM) Platform, Enterprise Edition 6 technology standards. The enterprise components presented in this course include Enterprise JavaBeans(TM) (EJB(TM)) technology, the Java Persistence API, servlets, and JavaServer Pages(TM) (JSP(TM)) technology, JavaServer Faces(TM) (JSF(TM)), RESTful and SOAP web services, and the Java technology clients that use them.

Students gain hands-on experience through labs that build an end-to-end, distributed business application. The labs explore session EJB components, which implement the Session Facade pattern and provide a front-end to entity components using the Java Persistence API. The labs also explore message-driven EJB components, which act as Java Message Service (JMS) consumers. Students create user interfaces using servlets, JSP technology (JSP pages), and JavaServer Faces (JSF). Basic web services using SOAP and RESTful techniques will be created. Students learn how to assemble an application and how to deploy an application into an application server (Java EE platform runtime environment). Students perform the course lab exercises using NetBeans(TM)Integrated Development Environment.

**About this Course**

**Audience Profile**

Sun(TM) Certified Java technology programmers who want to develop enterprise applications that conform to the Java EE platform standards.

- Students with Java Programming experience interested in broad overview of the Java EE platform.
- Students planning to pursue one or more of the Enterprise Java EE6 certification exams.

**After completing this course, students will be able to:**

- Describe the application model for the Java EE platform and the context for the model
- Select the correct Java EE Profile for a given application
- Develop and run an EJB technology application
- Develop basic Java Persistence API entity classes to enable database access
- Develop a web-based user interface using Servlets, JSPs, and JSF

**Prerequisites**

- Experience with the Java programming language
- Familiarity with object serialization
Developing Applications for the Java EE6 Platform Intermediate

Course Outline

Survey of Java EE Technologies
- Familiarity with relational database theory and the basics of structured query language (SQL)
- Familiarity with the use of an IDE
- Suggested Prerequisites
- Object-Oriented Analysis and Design Using UML (OO-226)
- Java Programming Language, Java SE 6 (SL-275-SE6)

Enterprise Application Architecture
- Design Patterns
- Model View Controller
- Synchronous and Asynchronous communication
- Network Topologies and Clustering
- Layering (client,presentation,service,integration,persistence)

Web Technology Overview
- Describe the role of web components in a Java EE application
- Define the HTTP request-response model
- Compare Java servlets, JSP, and JSF
- Brief introduction to technologies not covered in detail

Developing Servlets
- Describe the servlet API
- Servlet configuration through annotations and deployment descriptors
- Use the request and response APIs
- Servlets as controllers

Developing With JavaServer Pages Technology
- Evaluate the role of JSP technology as a presentation mechanism
- Author JSP pages
- Process data received from servlets in a JSP page
- Brief introduction to the JSTL and EL

JavaServer Faces
- The JSF model explained
- Adding JSF support to web applications
- Using the JSF tag libraries
- Configuring JSF page navigation
- JSF Managed beans
- JSF Conversion, Validation, and Error Handling

Survey of Java EE Technologies
- Describe the different Java platforms and versions
- Describe the needs of enterprise applications
- Introduce the Java EE APIs and services
- Certifications Paths
- Introducing Applications Servers
- Enterprise Modules

EJB Overview
- EJB types: Session Beans
- EJB types: Message Driven beans
- Java Persistence API as a replacement for Entity EJBs
- Describe the role of EJBs in a Java EE application
- EJB life

Implementing EJB 3.0 Session Beans
- Compare stateless and stateful behavior
- Describe the operational characteristics of a stateless session bean
- Describe the operational characteristics of a stateful session bean
- Describe the operational characteristics of a singleton session bean
- Create session beans
- Package and deploy session beans
- Create session bean clients

The Java Persistence API
- The role of the Java Persistence API in a Java EE application
- Object Relational Mapping
- Entity class creation
- Using the EntityManager API
- The life cycle and operational characteristics of Entity components
- Persistent Units and Packaging

Implementing a Transaction Policy
- Describe transaction semantics
- Compare programmatic and declarative transaction scoping
- Use the Java Transaction API (JTA) to scope transactions programmatically
- Implement a container-managed transaction policy
- Support optimistic locking with the versioning of entity components
- Support pessimistic locking of entity components
- Using transactions with the web profile

Developing Asynchronous Java EE Applications and Messaging
- The need for asynchronous execution
- JMS technology introduction
- List the capabilities and limitations of Java EE components as messaging producers and consumers
- JMS and transactions
- JMS administration
COURSE OUTLINE

Developing Applications for the Java EE6 Platform Intermediate

Developing Message-Driven Beans
- Describe the properties and life cycle of message-driven beans
- Create a JMS message-driven bean

Web Service Model
- Describe the role of web services
- Web service models
- List the specifications used to make web services platform independent
- Describe the Java APIs used for XML processing and web services

Implementing Java EE Web Services with JAX-WS and JAX-RS
- Describe endpoints supported by the Java EE 6 platform

Developing Web Services with Java
Creating Web Service Clients with Java

Implementing a Security Policy
- Exploit container-managed security
- Define user roles and responsibilities
- Create a role-based security policy
- Use the security API
- Configure authentication in the web tier
Fundamentals of the Java Programming Language, Java SE 6

The Fundamentals of the Java Programming Language course was designed to enable students with little or no programming experience to begin to learn programming using the Java programming language. The course teaches the significance of object-oriented programming, the keywords and constructs of the Java programming language, and the steps required to create simple Java technology programs. Students taking this course can receive a solid basis in the Java programming language upon which to base continued work and training.

Students who can benefit from this course:

- Beginners to programming who have basic mathematical, logical, and analytical problem-solving skills and who want to begin learning the Java programming language. This includes technical writers, web developers, technical managers, and individuals with a technical, non-programming background, such as system administrators
- Novice programmers and those programmers who prefer to start learning the Java programming language at an introductory level.
- Students who wish to begin their study of the Sun Certified Java Associate (SCJA) exam

Course Objectives:

- Demonstrate knowledge of Java technology, the Java programming language, and the product life cycle
- Use various Java programming language constructs to create several Java technology applications
- Use decision and looping constructs and methods to dictate program flow
- Implement intermediate Java technology programming and object-oriented (OO) concepts in Java technology programs

Course Topics:

Explaining Java Technology

- Describe key concepts of the Java programming language
- List the three Java technology product groups
- Summarize each of the seven stages of the product life cycle

Analyzing a Problem and Designing a Solution

- Analyze a problem using object-oriented analysis
- Design classes from which objects will be created

Developing and Testing a Java Technology Program

- Identify the four components of a class in the Java programming language
- Use the main method in a test class to run a Java technology program from the command line
- Compile and execute a Java technology program

Declaring, Initializing, and Using Variables

- Identify the use the syntax for variables and define the syntax for a variable
- List the eight Java programming language primitive data types
- Declare, initialize, and use variables and constants according to Java programming language guidelines and coding standards
• Modify variable values using operators
• Use promotion and type casting

Creating and Using Objects

• Declare, instantiate, and initialize object reference variables
• Compare how object reference variables are stored in relation to primitive variables
• Use a class (the String class) included in the Java Software Developer Kit (SDK)
• Use the Java 2 Platform, Standard Edition (J2SE[TM]) class library specification to learn about other classes in this application programming interface (API)

Using Operators and Decision Constructs

• Identify relational and conditional operators
• Create if and if/else constructs
• Use the switch construct

Using Loop Constructs

• Create while loops
• Develop for loops
• Create do/while loops

Developing and Using Methods

• Describe the advantages of methods and define worker and calling methods
• Declare and invoke a method
• Compare object and static methods
• Use overloaded methods

Implementing Encapsulation and Constructors

• Use encapsulation to protect data
• Create constructors to initialize objects

Creating and Using Arrays

• Code one-dimensional arrays
• Set array values using length attribute and a loop
• Pass arguments to the main method for use in a program
• Create two-dimensional arrays

Implementing Inheritance

• Define and test your use of inheritance
• Explain abstraction
• Explicitly identify class libraries used in your code
Implementing and Maintaining Microsoft SQL Server 2008 Reporting Services

About this Course

Elements of this syllabus are subject to change.

This three-day instructor-led course teaches students how to implement a Reporting Services solution in an organization. The course discusses how to use the Reporting Services development tools to create reports, and how to use the Reporting Services management and administrative tools to manage a Reporting Services solution.

MCSA Candidate Profile

This course is intended for information technology (IT) professionals and developers who need to implement reporting solutions by using Microsoft SQL Server 2008 Reporting Services.

After the Course

After completing this course, students will be able to:

- Describe SQL Server Reporting Services and its components.
- Create a Reporting Services report.
- Enhance a Reporting Services report.
- Create and manipulate data sets.
- Use report models to implement reporting for business users.
- Configure report publishing and execution settings.
- Implement subscriptions for reports.
- Administer Reporting Services.
- Implement custom Reporting Services applications.

Course Outline

Module 1: Introduction to Microsoft SQL Server Reporting Services

The students will be introduced to the role that Reporting Services plays in an organization's reporting life cycle, the key features offered by Reporting Services, and the components that make up the Reporting Services architecture.

Lessons

- Overview of SQL Server Reporting Services
- Installing Reporting Services
- Reporting Services Tools
Lab: Introduction to Microsoft SQL Server Reporting Services
- (Level 200) Exploring Report Designer
- (Level 200) Exploring Report Manager
After completing this module, students will be able to:
- Describe the features of SQL Server Reporting Services.
- Install Reporting Services.
- Describe the Reporting Services tools.

Module 2: Authoring Basic Reports
The students will learn the fundamentals of report authoring, including configuring data sources and data sets, creating tabular reports, summarizing data, and applying basic formatting.

Lessons
- Creating a Basic Table Report
- Formatting Report Pages
- Calculating Values

Lab: Authoring Basic Reports
- (Level 200): Creating a Basic Table Report
- (Level 200): Formatting Report Pages
- (Level 200): Adding Calculated Values
After completing this module, students will be able to:
- Create a basic table report.
- Format report pages.
- Calculate values for a report.

Module 3: Enhancing Basic Reports
The students will learn about navigational controls and some additional types of data regions, and how to use them to enhance a basic report.

Lessons
- Interactive Navigation
- Displaying Data

Lab: Enhancing Basic Reports
- (Level 200) Using Dynamic Visibility
- (Level 200) Using Document Maps
- (Level 200) Initiating Actions
- (Level 200) Using a List Data Region
- (Level 200) Creating a Tablix Report
- (Level 200) Adding Chart Subreport to Parent Report
After completing this module, students will be able to:
- Create reports with interactive navigation.
- Display data in various formats.

Module 4: Manipulating Data Sets
The students will explore data sets to a greater depth, including the use of alternative data sources and interacting with a data set through the use of parameters. Students will learn how to dynamically modify the data set underlying a data region by allowing parameters to be sent to the underlying query, as well as will learn to use best practices to implement static and dynamic parameter lists when interacting with queries and stored procedures.

Lessons
- Defining Report Data
• Using Parameters and Filters
• Using Parameter Lists

**Lab: Manipulating Data Sets**
• (Level 200) Using Parameters to Restrict Query Results
• (Level 200) Using Parameters to Filter Report Data
• (Level 200) Creating Dynamic Parameter Lists
• (Level 200) Using Parameters with a Stored Procedure
• (Level 200) Displaying All Categories in a Parameter List

After completing this module, students will be able to:
• Define report data.
• Use parameters and filters.
• Use parameter lists.

**Module 5: Using Report Models**
The students will learn how to create a report model so that business users can create their own reports without using the full Report Designer development environment. Students will also learn how to use Report Builder to create a report from a report model.

**Lessons**
• Creating Report Models
• Using Report Builder

**Lab: Using Report Models**
• (Level 200) Creating a Report Model
• (Level 200) Using Report Builder to Create a Report

After completing this module, students will be able to:
• Create Report Models.
• Use Report Builder.

**Module 6: Publishing and Executing Reports**
The students will learn the various options you can use to publish reports to the report server and execute them.

**Lessons**
• Publishing Reports
• Executing Reports
• Creating Cached Instances
• Creating Snapshots and ReportHistory

**Lab: Publishing and Executing Reports**
• (Level 200) Publishing Reports
• (Level 200) Executing Reports
• (Level 200) Configuring and Viewing a Cached Report
• (Level 200) Configuring and Viewing a Snapshot Report

After completing this module, students will be able to:
• Publish reports.
• Execute reports.
• Create cached instances.
• Create snapshots and reportHistory.

**Module 7: Using Subscriptions to Distribute Reports**
The students will learn how to implement subscriptions so that you can distribute reports either automatically by e-mail or by publishing reports to a shared folder.
Lessons
- Introduction to Report Subscriptions
- Creating Report Subscriptions
- Managing Report Subscriptions

Lab: Using Subscriptions to Distribute Reports
- (Level 200) Creating a Standard Subscription
- (Level 200) Creating a Data-Driven Subscription

After completing this module, students will be able to:
- Describe report subscriptions.
- Create report subscriptions.
- Manage report subscriptions.

Module 8: Administering Reporting Services
The students will learn how to administer the Reporting Services server, how to monitor and optimize the performance of the report server, how to maintain the Reporting Services databases, and how to keep the system secure.

Lessons
- Reporting Server Administration
- Performance and Reliability Monitoring
- Administering Report Server Databases
- Security Administration
- Upgrading to Reporting Services 2008

Lab: Administering Reporting Services
- (Level 200) Using Reporting Services Configuration Manager
- (Level 200) Securing a Reporting Services Site
- (Level 200) Securing Items

After completing this module, students will be able to:
- Administer the reporting server.
- Monitor performance and reliability.
- Administer the Report Server databases.
- Administer security.
- Upgrade to Reporting Services 2008.

Module 9: Programming Reporting Services
The students will learn how to query Reporting Services information programmatically and how to automate report management tasks. Students will also learn how to render reports without relying on Report Manager, and how to extend the feature set of a report server by creating custom code.

Lessons
- Querying for Server Information Using a Web Service
- Automating Report Management
- Rendering Reports
- Creating Custom Code

Lab: Programming Reporting Services
- (Level 200) Using URL Access to Display a Report
- (Level 200) Building a Reporting Services Web Service Client
- (Level 200) Using the Report Viewer Control

After completing this module, students will be able to:
- Query server information using a Web service.
- Automate report management.
- Render reports.
- Create custom code.
About this Course

Learn the fundamentals and best practices of project management methodology as applied to IT initiatives, and practice and master the skills you need to deliver IT projects on time, within budget, and to specification. Examine all aspects of IT projects, including hardware, software, vendor relationships, communicating with different audiences, and working with virtual teams. Learn to determine project scope through effective requirements identification, set and manage stakeholder expectations, identify and manage IT risks, and meet quality standards. Learn how to overcome the most common pitfalls of IT project success.

Audience Profile

IT professionals, IT project managers, IT managers, IT project team members, associate project managers, project managers, project coordinators, project analysts, project leaders, senior project managers, team leaders, product managers, and program managers.

At Course Completion

Upon successful completion of this course, students will be able to:

- Identify Quality Requirements
- Identify the Stakeholders
- Complete the Project Charter
- Trace Requirements
- Determine the Work Breakdown Structure
- Break Down the Work into Activities
- Sequence the Activities
- Estimate Activity Duration
- Use Network Diagramming
- Identify Resource Requirements
- Create a Responsibility Assignment Matrix
- Develop a Project Cost Estimate
- Create a Communication Management Plan
- Assess Project Risks
- Determine Risk Response Strategies
- Manage a Vendor Driven Change
- Develop a Change Management Plan
Prerequisites

If you have previously taken Project Management Fundamentals, you should not take this course, as there is significant content overlap.

Course Outline

1. IT Project Foundations
   - IT Project Success and Failure
   - Practical Project Methodologies
   - Software Development Methodologies and Processes
   - Definition of a Project
   - Project Management as a Service Industry
   - Formal vs. Informal Management
   - Complexity and Uncertainty in Projects
   - Influences of Organizational Structure on Project Management
   - Project Management Institute (PMI®)
   - Project Management Life Cycle
   - Project Management as a Subset of Overall Management Skills
   - Iterative Nature of the Project Management Life Cycle

2. Quality in IT Projects
   - Quality Management
   - IT Project Testing

3. Project Initiation
   - Activities of Project Initiation

4. Project Scope Definition
   - Scope
   - Defining and Gathering Requirements
   - Tracing
   - Work Breakdown Structure

5. Time Management and Scheduling
   - Time Decomposition
   - Network Diagramming

6. Resource Planning
   - Identification of Required Project Resources
   - Roles and Responsibilities Chart
   - Staffing Management Plan
   - Resource Constraints
   - Responsibility Assignment Matrix

7. Cost Management and Control
   - Cost Planning and Analysis
   - Cost Estimating Techniques
   - Levels of Accuracy in Estimates
   - Cost Estimates at Planning Milestones
   - Contingency and Management Reserves
8. Communications Management

- Management of Stakeholder Expectations
- Considerations for Effective Communication
- Lines of Communication
- Forms of Communication
- Communication Management Plan
- Project Status Report

9. Risk Management

- Essentials of Project Risk Management
- Risk Sources for the IT Project
- Stakeholder Risk Tolerance
- Risk Identification Techniques
- Risk Ranking
- Risk Triggers
- Risk Response Strategies

10. Vendor Management

- Procurement and Sourcing Management
- Overview of Vendor Management
- Vendor Management Success
- Measures of Vendor Management Success

11. Change Management

- Project Changes
- Integrated Change Control
- Change Control Process

12. Phase and Project Closure

- Phase and Project Closing
- Lessons Learned
- Phase and Project Reports
ITIL Intermediate Continual Service Improvement

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Continual Service Improvement stage of the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Continual Service Improvement certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Continual Service Improvement phase of the ITIL Lifecycle as well as the processes, functions and activities required to apply them.

At Course Completion

At the end of this course, you will learn:

- The purpose and objectives of Continual Service Improvement
- How Continual Service Improvement integrates with the stages in the Lifecycle
- How Continual Service Improvement depends upon an understanding of change within an organization
- The nature of the activities and the skills required for the 7 step improvement process
- How tools can assist some or all of the activities in the Continual Service Improvement process
- The effects on an organization of the challenges facing Continual Service Improvement

Course Outline

1. COURSE INTRODUCTION
   
   - Purpose and objectives of Continual Service Improvement
   - Scope of Continual Service Improvement
   - Approach to Continual Service Improvement
   - Interfaces with other ITIL Lifecycle stages

2. PRINCIPLES
   
   - How the success of CSI depends upon an understanding of change upon an organization
   - How CSI drives the adoption of, and is influenced by, Service Level Management
   - How the Deming Cycle is critical to both the implementation and application of CSI
   - Effective use of the various aspects of Service Measurement
   - Knowledge Management and improvement initiatives
• CSI and good governance where goals are aligned and good management is achieved.
• How frameworks, models, standards and quality systems fully support the concepts embodied in CSI

3. PROCESSES

• The 7-step improvement process.
• How CSI integrates with the other stages in the Service Lifecycle
• Service Reporting and articulate reporting policies and rules
• Service Measurement
• The importance of properly defining metrics and measurements
• The concept of Return on Investment for CSI and how to create a return on investment, establish a business case and measure the benefits achieved
• The various Business questions for CSI
• The relationship between CSI and Service Level Management

4. METHODS AND TECHNIQUES

• What to assess and when
• Using gap analysis to identify areas with room for improvement
• Benchmarking
• Measuring and Reporting frameworks such as the BSC and SWOT analysis
• The Deming Cycle
• The relationships and interfaces with other service management processes
• Effective use of availability management techniques by CSI
• Effective use of capacity management techniques by CSI
• ITSCM requirements and using Risk Management to identify areas for improvement
• Support from Problem management

5. ORGANIZATION

• The nature of the activities and the skills required for the 7-step improvement process
• The responsibilities, skills and competencies for Service Manager, CSI Manager, and Service Owner
• How authority matrices (RACI) can very used when defining communication procedures in the CSI process

6. TECHNOLOGY CONSIDERATIONS

• How the following tools can be used to assist some or all of the activities of the Continual Service Improvement process
• IT service management suites
• System and network management
• Event management
• Automated Incident/Problem resolution
• Performance Management
• Statistical Analysis tools
• Project and Portfolio Management
• Financial management
• Business Intelligence reporting

7. IMPLEMENTATION AND IMPROVEMENT
• Where to start
• The role of Governance to CSI
• The effect of Organizational Change for CSI
• A Communications strategy and Plan

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

• The effects on an organization of the challenges facing Continual Service Improvement
• The appropriate critical success factors for Continual Service Improvement
• The potential impact if the risks associated with implementing CSI
• The potential value to business, benefits and costs

9. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL: Managing Across the Lifecycle (MALC)

About this Course

The ITIL MALC (Managing Across the Lifecycle) course offers candidates the ability to achieve the ITIL Expert certification upon passing the ITIL Managing Across the Lifecycle exam. The course prepares candidates to take the ITIL Managing Across the Lifecycle Intermediate exam as well as providing valuable knowledge that can be implemented in the workplace. This certification completes the ITIL Intermediate Lifecycle and Capability streams by focusing on the knowledge required to implement and manage the necessary skills associated with the use of the Service Lifecycle.

Prerequisite

An ITIL Foundation certificate and a minimum of 15 credits earned through the formal Service Lifecycle stream or Service Capability stream qualifications.

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a deeper knowledge of, or who are involved in managing services across the different lifecycle phases.

At Course Completion

At the end of this course, you will learn:

- Managing the planning and Implementation of IT Service Management
- Lifecycle positioning and transition
- How to achieve business value with people, process and function
- Challenges, Critical Success Factors and risks to service management
- Risk Management
- Lifecycle project assessment
- Management of strategic change
- Understanding complementary industry guidance

Course Outline

1. COURSE INTRODUCTION

- Lifecycle positioning and transition
- The difference between open-loop and closed-loop systems
- Complex Monitor Control loops
- ITSM Monitor Control loops
- Relationship between Business and IT
• How to achieve business value with people, process and function
• How to achieve business value with supplier relationship and technology alignment

2. MANAGEMENT OF STRATEGIC CHANGE (MOC)

• Value creation challenge
• Critical success components to managing lifecycle risk
• Business benefits
• Determining Benefit Realization
• Determining Value to Business VOI, ROI
• Determining Variable Cost Dynamics (VCD)
• Alignment of business policy, future direction and Demand Management
• Alignment to service portfolio and service catalogue management
• Planning and Defining scope
• Awareness of design and delivery model choices
• Budgeting, costing, service assets
• Intangible and Measuring benefits
• Assets- Service and Strategic influencing
• Defining awareness communication activities
• People Education and knowledge transfer management
• Business Relationship Management
• Service Structure and Value nets and value-chains
• Termination and Retirement of Services

3. RISK MANAGEMENT

• Challenges, Critical Success Factors and risks to service management
• Identification of Risk
• Evaluation of Risk – CFIA, FTA, BIA, SFA, Risk Analysis and Management
• Corrective Actions
• Controlling Risk
• Transfer of risks
• Service Provider risks
• Contract risks
• Design risks
• Operational risks
• Market risks

4. PLANNING AND IMPLEMENTING

• Activities during Plan, Do, Check, Act including Aspects of Strategy and the 4P’s of Strategy
• Policy considerations
• Strategy considerations
• Design considerations
• Transition considerations
• Directing
• Value of achieving business goals by guiding, leading and monitoring
• Controlling and Evaluating
• Value of verifying and using feedback to control lifecycle
• Organizational Form and Design
• Communication, Coordination and Control

5. UNDERSTANDING ORGANIZATIONAL CHALLENGES

• Organizational maturity
• Organizational structure
• Knowledge management and security of information
• Organizational transition
• Governance
• Balance in Service Operations

6. SERVICE ASSESSMENT

• Value of Measuring
• Why Measure
• What to Measure
• Value of Monitoring
• What to Monitor
• Reporting
• Service Portfolio assessment across the lifecycle
• Assessment of achievements
• Corrective action
• Business Perspective and Improvements

7. UNDERSTANDING COMPLEMENTARY INDUSTRY GUIDANCE AND TOOL STRATEGIES

• COBIT
• ISO/IEC 20000
• CMMI
• Balanced Scorecard
• Quality Management
• OSI Framework
• Annuity
• Service Management maturity framework
• Six Sigma
• Project Management
• TQM
• Management Governance framework

8. EXAM PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Planning, Protection & Optimization

About this Course

Participants will learn the principles and core elements of the Service Capability approach to IT Service Management as well as focusing on the processes & roles, activities and their execution throughout the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Planning, Protection & Optimization certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

IT Managers, Operational staff, and anyone requiring a deeper knowledge of or who are involved in Planning, Protection & Optimization cluster of processes and functions.

At Course Completion

At the end of this course, you will learn:

- The concept of Service Management as a practice
- The functions & processes across the Lifecycle
- The purpose, goal and objectives of Availability Management
- The purpose, goal and objectives of Capacity Management
- The purpose, goal and objectives of IT Service Continuity Management
- The purpose, goal and objectives of Information Security Management
- The purpose, goal and objectives of Demand Management
- Technology Implementation considerations

Course Outline

1. COURSE INTRODUCTION

- Introduction/Housekeeping
- Service Management as a practice
- Service, its value proposition and composition
- Functions and processes across the lifecycle
- The role of processes in the Service Lifecycle
- How Service Management creates business value
- How Planning, Protection and Optimization supports the
- Service Lifecycle
2. CAPACITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Capacity Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Capacity Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Capacity Management

3. AVAILABILITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Availability Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Availability Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Availability Management

4. IT SERVICE CONTINUITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of ITSCM as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable ITSCM and how each particular Stage relates to Planning, Protection and Optimization
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful ITSCM

5. INFORMATION SECURITY MANAGEMENT

- Purpose, goal, objectives & scope
- Importance of Information Security Management as a process to generate business value
- Policies, principles and basic concepts
- Activities, methods and techniques that enable Information Security Management and how they relate to Planning, Protection and Optimization.
- Triggers, inputs, outputs and interfaces with other processes
- How the key metrics can be used to demonstrate the efficiency and effectiveness of successful Information Security Management

6. DEMAND MANAGEMENT

- Basic concepts of Demand Management
- Activity based Demand Management and business activity patterns
- Interfaces to Service Design
- Managing demand for Services
- Activities, methods and techniques that enable this process and how they relate to Planning, Protection and Optimization

7. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

- Challenges, Critical Success Factors and risks related to Capacity & Demand Management
• Challenges, Critical Success Factors and risks related to Availability Management
• Challenges, Critical Success Factors and risks related to ITSCM
• Challenges, Critical Success Factors and risks related to Information Security Management
• Challenges, Critical Success Factors and risks directly associated with the Service Design phase of the Service Lifecycle and how it relates specifically to PPO

8. ROLES AND RESPONSIBILITIES

• Capacity Management process
• Availability Management process
• IT Service Continuity Management process
• Information Security Management process

9. TECHNOLOGY AND IMPLEMENTATION CONSIDERATIONS

• Requirements for technology to assist Service Design
• Evaluation criteria for technology and tooling for process implementation
• Practices for practice and process implementation
• Challenges, Critical Success Factors and risks related to implementing practices and processes

10. Exam PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Release Control & Validation

About this Course

Participants will learn the principles and core elements of the Service Capability approach to IT Service Management as well as focusing on the processes & roles, activities and their execution throughout the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Release, Control & Validation certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

IT Managers, Operational staff, and anyone requiring a deeper knowledge of or who are involved in the Release, Control & Validation cluster of processes and functions.

At Course Completion

At the end of this course, you will learn:

- The concept of Service Management as a practice
- The purpose, goal and objectives of the Change Management Process
- The purpose of the SACM process and the goal of Configuration Management
- The use of a Configuration Management System (CMS), and its major components, in supporting the effective execution of SACM process
- The purpose, goal, objectives and scope of the RDM process
- The purpose, goal and objectives of the SVT process
- The purpose, goal, objectives and scope of the KM process
- The purpose, goal, objectives and scope of the Service Evaluation process
- The purpose and scope of the Request Fulfillment process

Course Outline

1. COURSE INTRODUCTION

- Introduction/Housekeeping
- Service Management as a practice
- Service, its value proposition and composition
- Functions and processes across the lifecycle
- The role of processes in the Service Lifecycle
• How Service Management creates business value
• How Release Control and Validation supports the Service Lifecycle

2. CHANGE MANAGEMENT
• Purpose, goal, objectives & scope
• Value to business and to the Service Lifecycle
• Policies, principles and basic concepts
• Types of Change Requests
• Triggers, inputs, outputs and interfaces with other processes
• How to measure effectively, metrics and their applications
• Activities and the Service Operation Lifecycle stage
• The relationship between Continual Service Improvement and organizational change

3. SERVICE ASSET AND CONFIGURATION MANAGEMENT
• Purpose, goal and objectives & scope
• Value to business and to the Service Lifecycle
• Policies, principles and basic concepts
• The use of a Configuration Management System (CMS)
• Process activities, tools and deliverables
• The considerations for retaining CMS back-up and historical data for business purposes
• How to measure effectively, metrics and their application
• Activities and the Service Operation Lifecycle stage

4. RELEASE AND DEPLOYMENT MANAGEMENT
• Purpose, goal and objectives & scope
• Release Unit, Release Design options and considerations
• Release and Deployment planning
• Developing the detailed implementation plan for release deployment
• Support after deploying the new Release
• Triggers, inputs and outputs and interfaces with other processes
• Information recording and maintenance
• Challenges, risks and Critical Success Factors

5. SERVICE VALIDATION AND TESTING
• Purpose, goal and objectives & scope
• Value to business and Service Lifecycle
• Policies and principles
• Validation and Testing perspectives, purposes and stakeholder requirements
• Test levels and test models to help with building quality services deliverables
• Process activities, methods and techniques and how they relate to the Service Lifecycle
• Triggers, inputs and outputs and the process interfaces
• Maintaining test data and test environments in respect of changing test requirements
• Measurement and Metrics

6. KNOWLEDGE MANAGEMENT
7. SERVICE EVALUATION

- Purpose, goal and objectives
- Scope
- Service Evaluation process terminology and workflow
- Intended effect and unintended effects of a change, and factors for evaluating the effectiveness of a Service Design and changes
- Evaluation of service performance to Risk Management and the potential impact on the course of actions for the overall Service Design/change evaluation
- Challenges pertaining to Service Evaluation

8. REQUEST FULFILLMENT

- Purpose, goal and objectives
- Scope
- How Request Fulfillment may help to establish a self-help service practice within an organization.
- The difference between Request Fulfillment and Incident Management
- The relationship between Request Fulfillment and Release Management, and how they interact with SACM
- Challenges, risk and Critical Success Factors

9. ROLES AND RESPONSIBILITIES

- Change Management
- Service Asset and Configuration Management
- Service Validation and Testing
- Release and Deployment Management
- Request Fulfillment
- Service Performance and Risk Evaluation activities
- Service Knowledge Management

10. TECHNOLOGY AND IMPLEMENTATION CONSIDERATIONS

- Requirements for ITSM technology for implementing processes
- Evaluation criteria for technology and tools for process implementation
- Challenges, Critical Success Factors and risks
- How to plan and implement Service Management technologies
- Technology considerations for implementing collaboration for process execution, Configuration Management and Knowledge Management
- The Deming Cycle
ITIL Intermediate Service Design

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Design stage of the Service Lifecycle. This lifecycle stage focuses on enabling Service Delivery by designing services in-line with the Service Strategy. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Design certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Service Design phase of the Lifecycle and the affected processes, functions and activities and their application.

At Course Completion

At the end of this course, you will learn:

- Service Design principles and service composition
- Activities and techniques within Requirements Engineering
- Functional roles analysis and use of the RACI matrix
- The types of tools that would benefit Service Design
- Activities and techniques associated with Application Management
- Designing supporting systems, especially the Service Portfolio
- Business Service Management (BSM) and Service Oriented Architecture (SOA) principles

Course Outline

1. COURSE INTRODUCTION

- The concept of Service Management as a practice
- The concept of Service, its value proposition and composition
- The concepts of Function, Process and Role The purpose, goals and objectives of Service Design
- The scope of Service Design
- Business value
- The contents and use of the Service Design Package
- The contents and use of Service Acceptance Criteria

2. PRINCIPLES

- Service Design principles and service composition
• The importance and approach to balanced design
• Service requirements, business requirements and drivers
• Design activities and constraints
• The principles and the five aspects of Service Design:
  • Design aspects
  • Designing service solutions
  • Designing supporting systems, especially the Service Portfolio
  • Designing technology architectures
  • Designing processes
  • Designing measurement systems and metrics
  • Business Service Management (BSM) and Service Oriented Architecture (SOA) principles
  • Service Design models

3. PROCESSES

• The activities and techniques, but not the detailed process steps, for the following processes:
  • Service Catalog Management
  • Service Level Management
  • Capacity Management
  • Availability Management
  • IT Service Continuity Management
  • Information Security Management
  • Supplier Management
  • Design Coordination
  • The five aspects of Service Design as they relate to the management of Service Design processes

4. TECHNOLOGY RELATED ACTIVITIES

• Activities and techniques within Requirements Engineering
• Activities and techniques within Data and Information Management
• Activities and techniques associated with Application Management

5. ORGANIZING FOR SERVICE DESIGN

• Functional roles analysis and use of the RACI matrix
• The roles and responsibilities within Service Design

6. TECHNOLOGY CONSIDERATIONS

• The types of tools that would benefit Service Design
• Requirements for Service Management tools

7. IMPLEMENTATION AND IMPROVEMENT

• The Service Design issues relating to:
  • Business Impact Analysis
  • Service Level Requirements Risks
  • The six-stage implementation approach
  • Measurements through Critical Success Factors and Key Performance Indicators
• Prerequisites for success and risks affecting Service Design activities and processes

8. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL Intermediate Service Operation

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Operation stage of the Service Lifecycle. This lifecycle stage focuses on organizing and maintaining the day-to-day Service Operation. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Operation certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers and ITSM trainers who require a detailed understanding of the ITIL Service Operation phase of the ITIL core Lifecycle and the affected processes, functions and activities and their application.

At Course Completion

At the end of this course, you will learn:

- The term "Service Operation", and how it fits in the overall core ITIL Lifecycle
- The operational activities of processes covered in other Lifecycle phases
- Service Operation Processes
- Organizational issues including: Functions, Groups, Teams, Department and Divisions
- Service Operation Activities
- Service Operation Technology Considerations and Requirements
- Planning and Implementing Service Management Technologies
- Managing Change in Service Operations
- Challenges, Critical Success Factors and Risks

Course Outline

1. COURSE INTRODUCTION

- The term "Service Operation", and how it fits in the overall core ITIL Lifecycle
- The main purpose and objectives of Service Operation
- The ITIL processes primarily covered in Service Operation
- The functions within Service Operation
- The value to the business
2. PRINCIPLES

- Organizational issues including: Functions, Groups, Teams, Department and Divisions
- Achieving balance in Service Operations
- Providing Service
- Involvement in Design and Transition
- Operational Health
- Communication
- Documentation

3. PROCESSES

- Event Management
- Incident Management
- Request Fulfillment
- Problem Management
- Access Management
- The operational activities of processes covered in other Lifecycle phases
- Change Management
- Configuration Management
- Release Management
- Capacity Management
- Availability Management
- Knowledge Management
- Financial Management
- IT Service Continuity Management

4. ACTIVITIES

- Monitoring and Control
- IT Operations
- Mainframe Management
- Server Management and Support
- Network Management
- Storage and Archive
- Database Management
- Directory Services Management
- Desktop Support
- Middleware Management
- Internet/Web Management
- Facilities and Data Center Management
- IT Security Management in relation to Service Operation
- Improvement of Operational Activities

5. ORGANIZATION

- Functions
- Service Desk
- Technical Management
- IT Operations Management
- Application Management
• Roles and Responsibilities
• Service Operation Organizational Structures

6. TECHNOLOGY CONSIDERATIONS

• Generic Requirements
• Event Management
• Incident Management
• Request Fulfillment
• Problem Management
• Access Management
• Service Desk

7. IMPLEMENTATION AND IMPROVEMENT

• Managing Change in Service Operations
• Service Operation and Project Management
• Assessing and Managing Risk in Service Operations
• Operational Staff in Design and Transition
• Planning and Implementing Service Management Technologies

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

• Challenges, Critical Success Factors and Risks

9. EXAM PREPARATION

• Sample Exam
• Feedback
• Recap
ITIL Intermediate Service Strategy

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Strategy stage of the Service Lifecycle. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Strategy certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers involved in the ongoing management, coordination and integration of strategizing activities within the Service Lifecycle.

At Course Completion

At the end of this course, you will learn:

- The logic of value-creation within the context of the ITIL Service Lifecycle
- Strategic assets of an organization and their performance potential for serving particular customers or market spaces (internal or external)
- Formal definitions of services suitable for planning and execution across the Service Lifecycle
- Service valuation, demand modeling, service provisioning and analysis, and business impact analysis
- Service Portfolio Management, methods, and processes related to service management and services
- High-level strategies for demand management that can be supported by capabilities across the Service Lifecycle
- How Service Strategy is driven through and informed by other elements of the Service Lifecycle

Course Outline

1. INTRODUCTION TO SERVICE STRATEGY

Objectives

- Full understanding of service strategy terms and core concepts.
- The purpose, goals and objectives of service strategy
- The scope of service strategy
- The value to the business
- The context of service strategy in relation to all other lifecycle stages.

2. SERVICE STRATEGY PRINCIPLES
Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to decide on a service strategy
- How to utilize the four P's of service strategy
- How to define services, create value and leverage the combined use of utility and warranty
- How to use service economics and sourcing strategies when meeting business outcomes.

3. SERVICE STRATEGY PROCESSES

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The management level concepts for the five service strategy processes and how they flow and integrate with the lifecycle
- The purpose, scope and objectives of each service strategy process and how they link to value for the business.

4. GOVERNANCE

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to analyze IT governance and use it to set strategy by leveraging governance frameworks, bodies.

5. ORGANIZING FOR SERVICE STRATEGY

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- The ability to create an organizational design using the relevant development and departmental methods.

6. TECHNOLOGY CONSIDERATIONS

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- Understand the relevance and opportunities for service automation and the importance and application of technology interfaces across the lifecycle.

7. IMPLEMENTING SERVICE STRATEGY

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
- Develop implementation strategies that follow a lifecycle approach (e.g. design, transition, operation and improvement, programs).

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

Objectives

- The knowledge, interpretation and analysis of service strategy principles, techniques and relationships and their application for creation of effective service strategies.
• The ability to provide insight and guidance for strategic challenges, risks and critical success factors.

9. EXAM PREPARATION

• Sample Exams
• Feedback
• Recap
ITIL Intermediate Service Transition

About this Course

Participants will learn the principles and core elements along with the activities and technology & implementation considerations within the Service Transition stage of the Service Lifecycle. This lifecycle stage focuses on putting services into operation without disruptions to the business. An interactive approach is used combining lecture, discussion and case study experience to prepare participants for the ITIL Intermediate Service Transition certification exam as well as providing valuable practical knowledge that can be rapidly applied in the workplace.

Prerequisite

ITIL Foundation

Target Audience

CIOs, CTOs, managers, supervisory staff, team leaders, designers, architects, planners, IT consultants, IT audit managers and IT security managers who require a detailed understanding of the ITIL Service Transition phase of the ITIL core Lifecycle and the affected processes, functions and activities and their application.

At Course Completion

At the end of this course, you will learn:

- Service Transition principles
- Change Management within Service Transition
- Implementation and Improvement concepts
- Service Transition Activities and Processes
- Designing supporting systems, especially the Service Portfolio
- Technology Considerations
- Management of Cultural change, risks and value

Course Outline

1. COURSE INTRODUCTION

- The term "Service Transition", and how it fits in the overall core ITIL Lifecycle
- The main purpose and objectives of Service Transition
- The ITIL processes primarily covered in Service
- Transition
- The functions within Service Transition
- The value to the business
2. PRINCIPLES

• Define and implement a formal policy
• Implement all changes to services
• Adopt a common framework and standards
• Maximize re-use of established processes and systems
• Align Service Transition plans with the business needs
• Maintain relationship with stakeholders
• Provide systems for knowledge transfer and decision support
• Assuring the quality of new or changed services
• Plan release and deployment packages
• Proactively improve quality

3. PROCESSES

• Transition planning and Support
• Change Management
• Service Asset and Configuration Management
• Release and Deployment Management
• Service Valuation and Testing
• Change Evaluation
• Knowledge Management

4. ACTIVITIES

• Communication
• Organizational Change
• Organizational Change Products
• Planning/ Implementing Change
• Resistance to Change
• Stakeholder Management

5. ORGANIZATION

• Change Management
• Service Asset and Configuration Management
• Service Validation and Testing
• Release and Deployment
• Request Fulfillment
• Service Performance and Risk Evaluation
• Service Knowledge Management

6. TECHNOLOGY CONSIDERATIONS

• Service Transition support tools
• ITSM Technology
• Knowledge Management tools
• Collaboration - Communities and Workflow Management
• Configuration Management System (CMS)
7. IMPLEMENTATION AND IMPROVEMENT

- Justifying Service Transition
- Designing Service Transition
- Introducing Service Transition
- Cultural Change
- Risks and Value
- Implementing Challenges, CSFs and Risks
- Service Transition under difficult circumstances

8. CHALLENGES, CRITICAL SUCCESS FACTORS AND RISKS

- Challenges, Critical Success Factors and Risks

9. EXAM PREPARATION

- Sample Exams
- Feedback
- Recap
ITIL® V3 Awareness Course

Course Description:
The 1 day ITIL® V3 Awareness course provides learners with the unique opportunity to receive an introduction to the concepts of ITIL and ITSM. It provides an overview of the concepts within the ITIL best practices domain while also introducing the key ITIL processes. This non-certificate course explains how ITIL processes are driven by a Service Lifecycle to provide smooth functioning to organizations, thus ensuring high-quality services to their customers. It has been designed for learners who need a basic awareness of ITIL V3 as a general interest, as part of a larger program initiative as opposed to the full certification Foundation course or for those who may not be sure of their future V3 training path and want to assess ITIL / ITSM viability in their organization.

Audience:
The Awareness course will be of interest to:

IT Staff, IT and Business Executives, IT Consultants, Key Business Users, IT Developers.

Learning Objectives:
At the end of this course, the learner will be introduced to:

- Current business challenges
- Frameworks, Standards, Best Practices & Governance – where does ITIL fit?
- ITIL description and value
- IT Service Management concepts
- ITIL V2 versus V3
- ITIL qualifications
- The Lifecycle approach to Service Management
- ITIL’s processes within the Lifecycle context
- Concepts & terminology of each phase in the Lifecycle
• Additional information on key processes
• Implementation considerations

**Course Organizational Logistics:**
• A maximum of 25 students can attend this course with 1 instructor
• Classroom with U-shaped seating arrangement
• Whiteboard, flipchart, projector
• Course runs 8:30am – 4:00pm each day

**Prerequisites:**
None

**Course Student Material:**
Students receive a copy of the classroom presentation material.

**About the Examination:**
There is no exam associated with this course.

**Credits:**
None in the ITIL scheme
ITIL® is a registered trademark of the Office of Government Commerce (OGC).
ITIL® V3 Managing Across the Lifecycle Course

Course Description:
The Managing Across the Lifecycle Certificate is the final module of the Service Lifecycle and/or Service Capability Intermediate courses that leads to the ITIL® Expert in IT Service Management recognition. This 5-day course immerses learners in the contents of the ITIL V3 publications, focusing on business, management and supervisory objectives, purpose, processes, functions and activities, and on the interfaces and interactions between the processes covered in the Service Lifecycle. This course is designed using an engaging scenario-based approach to learning the core disciplines of the ITIL best practice and positions the student to successfully complete the associated exam.

Audience:
The Managing Across the Lifecycle course will be of interest to:
- Individuals who require a business and management level understanding of the ITIL V3 core Lifecycle and how it may be implemented to enhance the quality of IT service provision within an organization
- Individuals seeking the ITIL Expert certification in IT Service Management for which this qualification is the final mandatory module leading to the Expert certification
- Individuals seeking progress towards the ITIL Master in IT Service Management for which the ITIL Expert is a prerequisite
- A typical role includes (but is not restricted to): CIO, Senior IT Manager, IT Manager and Supervisor, IT professional and IT Operation practitioner.

Learning Objectives:
At the end of this course, the learner will gain competencies in:
- Introduction to IT Service Management business and managerial issues
- Managing the planning and implementation of IT Service Management
- Management of strategic change
- Risk management
- Understanding organizational challenges
- Service assessment
- Understanding complementary industry guidance
**Prerequisites:**
Candidates for this course must:

- Hold the ITIL Foundation Certificate in IT Service Management (2 credits from the V3 Foundation or V2 Foundation plus Bridge Certificate) and have obtained a further 15 credits (a total of at least 17 credits) as a minimum from a balanced selection of ITIL Service Lifecycle or Service Capability qualifications

**Credits:**
- Upon successful passing of the ITIL V3 Managing Across the Lifecycle exam, the student will be recognized with 5 credits in the ITIL qualification scheme.
- Project Management Institute – Professional Development Units (PDUs) = 38* subject to change

ITIL® is a Registered Trade Mark of the Office of Government Commerce in the United Kingdom and other countries.
ITIL® V3 Service Manager Bridge Course (ITSMA)

This accredited ITIL class is offered in partnership with ITSM Academy.

ITIL Training is based on a Qualification Scheme and Point System. The ITIL Expert, similar to the V2 Manager's Certificate in Service Management, is awarded upon reaching 22 credits inside the Training Scheme. This is now the highest scholastic achievement inside of IT Service Management. For ITIL Service Manager professionals, the ITIL V3 Managers Bridge Course is the quickest and most cost effective approach to earn the ITIL Expert™ Certification.

Embedded into the Managers Bridge course is ITSM Academy's unique virtualization, Living the Lifecycle®. Woven through all ITSM Academy's ITIL Certification courses, this virtualization brings the concepts and processes to life. Within a virtual business environment, a new web service is introduced and then, as a group, we guide the service through its strategy, design, transition, operation and continual improvement within a virtual business environment.

The course covers the subject areas of all five (5) lifecycle stages which are new to V3 and those existing subject areas of V2 which have undergone significant change. It bridges the gap between the ITIL V2 Service Manager Certificate in IT Service Management and the V3 Advanced Certification, the ITIL Expert™.

Project Management Institute (PMI) Professional Development Units (PDUs):

ITSM Academy is recognized by PMI as a Global R.E.P. Project Management Professionals earn 38 contact hours or PDUs upon completion of this course.

Instructors:

As with all ITSM Academy Training, our instructors have successful track records as IT professionals / practitioners and bring that acumen into the classroom. Utilizing the highest quality content, our trainers blend their real life experiences into lively classroom discussion. Trainers for this course are ITIL Expert™ and Service Manager certified.

Prerequisites:

This course is only intended for those holding a valid Manager's Certificate in IT Service Management based on ITIL versions 1 or 2 and those V2 Practitioners who have accrued sufficient credits. Existing Service Managers (17 credits) may sit for the V3 Managers Bridge course (5 day, 5 credits) and pass the examination to achieve the ITIL Expert™ Certification. ITIL Practitioners (with 12+ credits) will need to also take and pass the Managing Across the Lifecycle (MALC) course to earn their ITIL Expert™.
Exam & Certification:
Successfully passing the ninety (90) minute, multiple-choice exam on the final day of class, leads to the ITIL Managers Bridge Certificate in IT Service Management. The passing score is 80% (16 of 20). The exam consists of ten (10) Scenarios with two (2) questions on each, for a total of twenty (20) scenario-based, complex multiple-choice questions.

Audience:

- Individuals currently possessing a V2 ITIL Manager's certificate wishing to learn the ITIL V3 Service Lifecycle
- Individuals currently possessing a V2 ITIL Manager's certificate wishing to bridge their certification to ITIL Expert™
- Individuals possessing at least three (3) ITIL V2 Practitioner certifications - to complete the bridging process, these individuals will also have to take and pass the Managing Across the Lifecycle course

Learning Objectives:
ITSM Academy's V3 Managers Bridge course examines the new topics in ITIL V3 and compares the main differences from earlier versions. In addition to preparing delegates for the examination, the course also allows learners to:

- Understand the Differences between V2 and V3
- Examine the Service Lifecycle in detail
- Understand V3 Key Terms and Concepts
- Understand the new roles and models defined in ITIL V3

Course / Student Material:

- Five (5) days of Instructor Led Education
- Learner Manual (excellent post-class reference)
- Participation in unique ITSM Academy virtualization, Living the Lifecycle®
- Reinforcing Memory Games
- Exam Preparation
- In-Class Exam

Notes:

- The five books of the ITIL V3 library are not included as part of the course material. Learners must bring their own copies. They are available through ITSM Bookstore.
- Upon registration, learners are emailed a copy of the official syllabus to identify class pre-reading.
• Maximum Learners per Class is 16.

Contact us for corporate, onsite delivery of this class.

ITSM Academy Open Enrollment Class Terms and Conditions.

Please Note: ITIL Foundation certification is required to take the Exam. Proof of certification must be provided to ITSM Academy a minimum 2 weeks prior to the start of class. Please email certification information to tech@atg.org or fax it to 404.252.8118.

ITIL V3 Managers Bridge Course.

ITIL® is a registered trademark of the Office of Government Commerce (OGC).
Java 6 Programming Fundamentals for OO Developers (C++, etc.) is a five-day, comprehensive hands-on workshop geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 6, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development.

At Course Completion

Students who attend Java 6 Programming Fundamentals for OO Developers will leave this course armed with the required skills to develop solid object-oriented applications written in Java, using sound coding techniques and best coding practices. Geared for developers with prior OO development experience in languages such as C++ or SmallTalk, this course will teach students everything they need to become productive in essential Java programming.

Working within a dynamic, hands-on learning environment, guided by our expert team, attendees will learn to:

- Understand not only the fundamentals of the Java language, but also its importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Learn to use Java multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java 6 features and capabilities
- Work with the logging API and framework that is part of the Java platform
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Understand and work with the classes in the concurrent package
- Outline the options for GUI applications in Java
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Throughout the five-day course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review.

Prerequisites

Working knowledge of object-oriented programming languages such as C++.

Course Outline

Java: A First Look

Lesson - Using the JDK
- Setting Up Environment
- The Development Process
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Applications and Applets

Lesson - Writing a Simple Class
- Classes in Java™
- What Is a Class?
- Defining the Class
- Class Modifiers
- Class Instance Fields
- Instance Fields Diagram
- Primitives vs. Object References
• Creating Objects
• The main Method
• Using the Dot Operator
• Writing Output

Lesson - The Java™ Platform
• Defining Java
• Java Provides Several Platforms
• Note on Terminology
• Java SE 6
• Java SE Development Kit (JDK)
• Executing Programs
• Lifecycle of a Java Program
• Responsibilities of JVM
• Java is Dynamic: The Runtime Process
• Primary Areas of the JVM Runtime
• Garbage Collection
• Documentation and Code Reuse
• JavaDoc Provides Documentation Delivery
• In-Line Comments are Translated into HTML Rendering
• Working with Java in Your Environment

Session Object-Oriented Concepts In Java

Lesson - Object-Oriented Programming
• The Object Oriented Way
• Real-World Objects
• Classes and Objects
• Examples of Classes and Objects
• Classes and Objects Diagram
• Object Behavior
• Methods and Messages

Lesson - Inheritance, Abstraction, and Polymorphism
• Encapsulation
• Inheritance
• Method Overriding
• Aggregation
• Type Abstraction - Grouping as Supertype
• Polymorphism
• Polymorphism Diagram

Session Getting Started with Java™

Lesson - Adding Methods to the Class
• Instance Methods
• Passing Parameters Into Methods
• Returning a Value From a Method
• Overloaded Methods
• Overloaded Methods Diagram

• Constructors
• Defining a Constructor
• Optimizing Constructor Usage

Lesson - Language Statements
• Operators
• Comparison and Logical Operators
• Looping: The for Statement
• Looping: The while Statement
• Looping: The do Statement
• Continue and Break Statements
• The switch Statement

Lesson - Using Strings
• Strings
• String Method
• String Equality
• StringBuffer
• Strings, StringBuffer, and StringBuilder
• StringTokenizer
• Scanner
• Scanner - File Source
• Scanner - Getting Input
• Scanner - Testing for Tokens
• Scanner - Patterns for Tokens
• Formatter
• Formatter - Probable First Encounters
• Formatter - StringBuffer

Lesson - Specializing in a Subclass
• Extending a Class
• The extends Keyword
• Casting
• Overriding Superclass Methods
• Method Overriding Diagram
• Calling Superclass Methods from Subclass
• The Object Class
• The equals Method
• Default Constructor
• Implicit Constructor Chaining
• Passing Data Up Constructor Chain
• A Common Programming Mistake
• Editing Tools in Your IDE

Session Essential Java™ Programming

Lesson - Fields and Variables
• Fields vs. Variables
• Data Types
• Default Values
• Block Scoping Rules
- Using this
- Final and Static Fields
- Static Variable Diagram

Lesson - Using Arrays
- Arrays
- Accessing the Array
- Multidimensional Arrays

Lesson - Static Methods and Fields
- Static Fields
- Simple Example of Static Fields
- Static Methods
- Lesson - Java™ Packages
- The Problem
- Packages
- Class Location of Packages
- The Package Keyword
- Importing Classes
- Executing Programs
- Visibility
- Java Naming Conventions
- Packages Diagram
- Refactoring in Your IDE

Session
Advanced Java™ Programming

Lesson - Inheritance and Polymorphism
- Polymorphism
- Polymorphism: The Subclasses
- Treating Derived Classes as the Superclass
- Casting to the Derived Class
- Using instanceof For Downcasting
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

Lesson - Interfaces and Abstract Classes
- Separating Capability from Implementation
- Abstract Classes
- Shape as an Abstract Class
- Polymorphism With Abstract Classes
- Interfaces
- Implementing an Interface
- Extending Interfaces
- Polymorphism With Interfaces
- Type Checking
- Abstract Classes vs. Interfaces
- Interfaces Diagram

Lesson - Exceptions
- What is an Exception?
- Exception Architecture
- Handling Exceptions
- The Throwable Class
- The try Block
- The catch Block
- The finally Block
- Full Example of Exception Handling
- Generalized vs. Specialized Exceptions
- Overriding Methods
- Creating Your Own Exceptions
- Throwing Exceptions
- Re-throwing an Exception
- Checked vs. Unchecked Exceptions
- Debugging in Your IDE

Session
Java™ Developer's Toolbox

Lesson - Utility Classes
- Wrapper Classes
- The Number Class
- Numbers and Strings
- Big Decimal
- Random Numbers
- Decimal Formatting
- The Date Class

Lesson - Vector and Hashtable
- The Vector Class
- Creating and Using a Vector
- Java Collections Methods in Vector
- Hashtables
- Understanding How Hashing Works
- Creating and Using a Hashtable
- Performing Lookups

Lesson - Collections
- The Collections Framework
- Collections Feature Types
- Collections Interface Hierarchy
- Map Interfaces
- Optional Methods
- The Collection Interface
- Iterators
- The Set Interface
- SortedSet
- Set and SortedSet Example
- Comparable and Comparator
- The List Interface
- List Example
Programming Fundamentals for OO Developers (C++, etc)

COURSE OUTLINE

• ListIterator
• Queue Interface
• QueueExample
• BlockingQueue
• BlockingQueue Implementations
• Collections Utility Methods
• Features of the Implementation Classes
• Synchronization Wrappers
• Feature Comparison
• Using the Right Collection
• Use of Collections vs. Vector/Hashtable
• Optimizing Collection Constructors
• Copying Arrays
• Creating and Using an ArrayList
• Creating and Using a HashMap

Lesson - Generics
• Generics and Parametric Polymorphism
• Simple Generics
• The Mechanics of Generics
• Generics and Subtyping
• Compiler Restrictions on Generics and Subtyping
• Generics as Arguments in Methods
• Rationale Behind Wildcards
• Wildcards In Use
• Regular Wildcards in Method Parameters
• Bounded Wildcards
• Standard Rules Apply
• Generic Methods
• Interoperability with Legacy Code
• Raw Types
• Legacy Calls To Generics
• When Generics Should Be Used
• Build Paths in Your IDE

Lesson - Overview of Java GUIs
• JFC - Java Foundation Classes
• Categories of Classes in JFC
• Creating the Frame
• Adding Content to a Frame
• A Closer Look at Layout Managers
• BorderLayout
• JFC Provides an Event Handling Structure

Lesson - Autoboxing, Enhanced for Loop and Varargs
• Autoboxing/Unboxing
• Autoboxing/Unboxing Issues
• For() Loops and Collections
• The Enhanced for() Loop
• Another Example - Problematic
• Another Example - Enhanced for()

• Enhanced for() Loop Restrictions
• Previous Variable Argument Support
• Variable Arguments in Java SE 1.5
• Varargs rules
• Issues

Lesson - Enumerations and Static Imports
• Rationale for Enumerations
• Enumeration Syntax
• Enumerations Methods
• Enumerations as a Better Class Type
• Enumeration Code
• EnumSet
• EnumMap
• When You Should Use Enumerations
• Using Static Imports
• When You Should Use Static Imports

Lesson - Inner Classes
• Defining Inner Classes
• Member Inner Classes
• Local Inner Classes
• Anonymous Inner Classes
• Anonymous Subclassing

Lesson - Multithreading
• Principles of Multithreading
• Creating a Threaded Class
• Creating a Threaded Class Using Runnable
• Example: Threaded Class
• Example: Runnable Class
• Basic Features of the Thread Class
• Daemon Threads
• Thread Scheduling
• Signaling a Thread
• Sleeping
• Thread Synchronization
• Synchronized Methods
• Synchronized Block
• Object Synchronization

Lesson - Java I/O
• The Java I/O Mechanism
• Byte Level I/O
• Subclasses Accessing Real Data
• Filter Classes
• Reading Stream as Data Primitives
• Adding Buffering for Better Performance
• Writing Buffered Data to a File
• Character Level I/O
• Subclasses Accessing Real Data
COURSE OUTLINE

- Reader/Writer Filter Classes
- Serialization
- Switching Java Versions in Your IDE

Lesson - Introduction to Annotations
- Annotations Overview
- Working with Java Annotations
- Example of Using @Override
- Annotations are Heavily Used in Many Technologies
- Declaring Persistence in Hibernate

Lesson - File System Access
- The File Class
- File Utility Methods
- RandomAccessFile
- Byte-Based File Access
- Text-Based File Access
- FileReader Diagram

Lesson - Networking
- Socket Programming Fundamentals
- Communicating on a Socket
- Single-Threaded Server Performance
- Creating a Threaded Server
- Sending and Receiving Objects
- Useful Methods

Lesson - JDBC™
- What is JDBC?
- Structured Query Language (SQL)
- Connecting to the Database
- Statements
- Statement and PreparedStatement
- ResultSet
- JDBC Diagram
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency
- Mapping SQL Types to Java Types
- Database Connection Via JDBC Calls
- Rationale for Connection Pooling
- Connection Pooling in JDBC
- Database Connection Using a DataSource
- Stored Procedures Defined
- Callable Statement Syntax
- Stored Procedure Parameters
- ResultSet Implementations
- JDBCRowSet
- JDBCRowSet Approach
- JDBCRowSet - Retrieving Data
- JDBCRowSet Example
- CachedRowSet
- CachedRowSet Approach
- CachedRowSet Example

Lesson - Java Logging
- Why Logging?
- Logging Framework
- Logging in Java
- Java Logging Framework
- The Logger Class
- Global Configuration
- Logging Levels
- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

Lesson - New In Java 6
- Java 6 - Performance
- Java 6 - Security Improvements
- Java 6 - Web Services Improvements
- Java 6 - Development
- Java 6 - GUI
- Java 6 - Compression
- Java 6 - Collection Interfaces
- Java 6 - Concrete Implementation
- Java 6 - Retrofitted
- Java 6 - More on Collection
- Java 6 - I/O
- Java 6 - Internationalization
- The JAXB Difference
The Linux Fundamentals course presents fundamental skills and concepts that you will use on the job in any type of Linux career.

Prerequisite

Basic knowledge of computer hardware, software, and operating system.

Target Audience

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of Linux concepts and skills to prepare for a career in Linux support or administration.

At Course Completion

Upon successful completion of this course, students will be able to:

- Identify basic Linux concepts and perform basic Linux tasks
- Manage user and group accounts
- Be able to describe partitions in the Linux Filesystem
- Work with Linux permissions
- Work with the Bash shell
- Manage processes and jobs
- Manage system services
- Install the Linux operating system
- Use a Graphical User Interface

Course Outline

Lesson 1: Familiarizing Yourself with Linux

Topic 1A: Review the History and Development of Linux
Topic 1B: Enter Shell Commands
Topic 1C: Get Help Using Linux
Topic 1D: Start and Stop Linux

Lesson 2: Managing User and Group Accounts

Topic 2A: Create User and Group Accounts
Topic 2B: Configure User Profiles
Topic 2C: Manage User and Group Accounts
Lesson 3: Managing Partitions and the Linux File system
Topic 3A: Create Partitions
Topic 3B: Navigate through the Linux Filesystem
Topic 3C: Manage the Filesystem
Topic 3D: Maintain the Filesystem

Lesson 4: Managing Files in Linux
Topic 4A: Create and Edit Files
Topic 4B: Locate Files

Lesson 5: Working with Linux Permissions and Ownership
Topic 5A: Modify File and Directory Permissions
Topic 5B: Modify Default Permissions
Topic 5C: Modify File and Directory Ownership

Lesson 7: Managing Packages
Topic 7A: Manage Packages Using RPM
Topic 7B: Verify Packages
Topic 7C: Upgrade Packages
Topic 7D: Configure Repositories
Topic 7E: Manage Packages Using YUM
Topic 7F: Manage Packages Using the Debian Package Manager
Topic 7G: Work with Source Files

Lesson 8: Managing Kernel Services
Topic 8A: Explore the Linux Kernel
Topic 8B: Customize Kernel Modules
Topic 8F: Monitor Processes and Resources

Lesson 9: Working with the Bash Shell and Shell Scripts
Topic 9A: Perform Basic Bash Shell Operations
Topic 9B: Introduction to Shell Scripting
Topic 9C: Customize the Bash Shell
Topic 9D: Redirect Standard Input and Output

Lesson 10: Managing Jobs and Processes
Topic 10A: Manage Jobs and Background Processes
Topic 10B: Manage Processes Using the Process Table
Topic 10C: Examine Delayed and Detached Jobs
Topic 10D: Schedule Jobs
Topic 10E: Maintain the System Time

Lesson 11: Managing System Services
Topic 11A: Configure System Services
Topic 11B: Monitor System Logs
Topic 11C: Configure SELinux

Lesson 12: Configuring Network Services
Topic 12A: Connect to a Network
Topic 12B: Configure Routes
Topic 12C: Configure DHCP
Topic 12D: Configure DNS
Topic 12E: Implement Network File Sharing Services

Lesson 13: Configuring Basic Internet Services
Topic 13A: Configure a Web Server
Topic 13B: Implement Apache Access Control
Topic 13D: Configure Email Services
Topic 13E: Control Internet Services

Lesson 14: Securing Linux
Topic 14A: Examine the Basics of System Security
Topic 14B: Secure User Accounts

Lesson 15: Managing Hardware
Topic 15A: Identify Common Hardware Components and Resources
Topic 15C: Configure Removable Hardware
Topic 15D: Configure Mass Storage Devices
Topic 15E: Manage Logical Volumes Using the Logical Volume Manager
Topic 15F: Configure Disk Quotas

Lesson 16: Troubleshooting Linux Systems
Topic 16A: Troubleshoot System-Based Issues
Topic 16B: Troubleshoot Hardware Issues
Topic 16C: Troubleshoot Network Connection and Security Issues
Lesson 17: Installing Linux
Topic 17A: Prepare for Installation
Topic 17B: Identify Phases of the Linux Boot Sequence
Topic 17C: Configure GRUB
Topic 17D: Install the Operating System
Topic 17E: Perform Post-Installation Tasks

Lesson 18: Configuring the GUI
Topic 18A: Implement X
Topic 18B: Customize the Display Manager
Topic 18C: Customize the Window Environment
Linux Fundamentals

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Red Hat Certified System Administration (RHCSA) Boot Camp

About this Course

The Red Hat Certified System Administration (RHCSA) boot camp is designed for experienced Linux system administrators who want to expand their technical skill sets and become accredited with the Red Hat Certified System Administration (RHCSA) certification. To successfully navigate this course, students must already have solid experience with the Linux command line—including the necessary skills to execute common commands, such as cp, grep, sort, mkdir, tar, mkfs, ssh, and yum—and be familiar with accessing man pages for help.

Course Content

- Installation, configuration, and management of local storage
- Deployment and maintenance of network services
- Network services: VNC, SSH, FTP, and web
- Securing files with ACLs
- Securing network services with firewall and SELinux
- Managing virtual machines with KVM technology
- Automating installation of Linux using Kickstart

Course Outline

Chapter 1: Prepare for Red Hat Hands-on Certifications
Chapter 2: Virtual Machines and Automated Installations
Chapter 3: Fundamental Command Line Skills
Chapter 4: RHCSA-Level Security Options
Chapter 5: The Boot Process
Chapter 6: Linux Filesystem Administration
Chapter 7: Package Management
Chapter 8: User Administration
Chapter 9: RHCSA Level System Administration Tasks
Chapter 10: A Security Primer
Chapter 11: System Services and SELinux
Chapter 12: RHCE Administrative Tasks
Chapter 13: Electronic Mail Servers
Chapter 14: The Apache Web Server
Chapter 15: The Samba File Server
Chapter 16: More File Sharing Services
Chapter 17: Administrative Services: DNS, NTP, and Logging
Microsoft SQL Server 2012 Boot Camp

About this Course

The Microsoft Certified Solutions Associate (MCSA): SQL Server 2012 certification shows that you have the primary set of SQL Server skills that are relevant across multiple solution areas in a business environment. The MCSA: SQL Server 2012 certification is a prerequisite for earning the MCSE: Data Platform or Business Intelligence certification.

MCSA Candidate Profile

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA SQL Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSA: SQL Server 2012

The primary goal of this program is to help each student pass the exams required to earn the MCSA SQL Server 2012 certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Introduction to Microsoft SQL Server 2012. This module introduces the SQL Server platform and major tools. It discusses editions, versions, tools used to query, documentation sources, and the logical structure of database.

Lessons

- Introducing Microsoft SQL Server 2012
- Getting Started with SQL Server Management Studio

Module 2: Getting Started with SQL Azure

This module introduces you to the concepts of SQL Azure. If the virtual machines in your classroom are able to connect to the internet and you have a Windows Azure account you may be able to connect to your Azure server and database. Many of the labs in the rest of this course are enabled for you to perform the lab while connected to your own Azure database in the cloud.
Lessons

- Overview of SQL Azure
- Working with SQL Azure

Module 3: Introduction to T-SQL Querying. This module introduces Transact SQL as the primary querying language of SQL Server. It discusses the basic structure of T-SQL queries, the logical flow of a SELECT statement, and introduces concepts such as predicates and set-based operations.

Lessons

- Introducing T-SQL
- Understanding Sets
- Understanding Predicate Logic
- Understanding the Logical Order of Operations in SELECT statements

Module 4: Writing SELECT Queries. This module introduces the fundamentals of the SELECT statement, focusing on queries against a single table.

Lessons

- Writing Simple SELECT Statements
- Eliminating Duplicates with DISTINCT
- Using Column and Table Aliases
- Writing Simple CASE Expressions

Module 5: Querying Multiple Tables. This module explains how to write queries which combine data from multiple sources in SQL Server. The module introduces the use of JOINs in T-SQL queries as a mechanism for retrieving data from multiple tables.

Lessons

- Understanding Joins
- Querying with Inner Joins
- Querying with Outer Joins
- Querying with Cross Joins and Self Joins

Module 6: Sorting and Filtering Data. This module explains how to enhance queries to limit the rows they return, and to control the order in which the rows are displayed. The module also discusses how to resolve missing and unknown results.

Lessons

- Sorting Data
- Filtering Data with a WHERE Clause
- Filtering with the TOP and OFFSET-FETCH Options
• Working with Unknown and Missing Values

Module 7: Working with SQL Server 2012 Data Types. This module explains the data types SQL Server uses to store data. It introduces the many types of numeric and special-use data types. It also explains conversions between data types, and the importance of type precedence.

Lessons

• Introducing SQL Server 2012 Data Types
• Working with Character Data
• Working with Date and Time Data

Module 8: Using Built-In Functions. This module introduces the use of functions that are built in to SQL Server Denali, and will discuss some common usages including data type conversion, testing for logical results and nullability.

Lessons

• Writing Queries with Built-In Functions
• Using Conversion Functions
• Using Logical Functions
• Using Functions to Work with NULL

Module 9: Grouping and Aggregating Data. This module introduces methods for grouping data within a query, aggregating the grouped data and filtering groups with HAVING. The module is designed to help the student grasp why a SELECT clause has restrictions placed upon column naming in the GROUP BY clause as well as which columns may be listed in the SELECT clause.

Lessons

• Using Aggregate Functions
• Using the GROUP BY Clause
• Filtering Groups with HAVING

Module 10: Using Subqueries. This module will introduce the use of subqueries in various parts of a SELECT statement. It will include the use of scalar and multi-result subqueries, and the use of the IN and EXISTS operators.

Lessons

• Writing Self-Contained Subqueries
• Writing Correlated Subqueries
• Using the EXISTS Predicate with Subqueries
Module 11: Using Table Expressions. This module introduces T-SQL expressions which return a valid relational table, typically for further use in the query. The module discusses views, derived tables, common table expressions and inline table-valued functions.

Lessons

- Using Derived Tables
- Using Common Table Expressions
- Using Views
- Using Inline Table-Valued Functions

Module 12: Using Set Operators. This module introduces operations involving multiple sets of data. It will cover the use of the UNION, UNION ALL, APPLY, CROSS APPLY, OUTER APPLY operators as well as the EXCEPT and INTERSECTS operators.

Lessons

- Writing Queries with the UNION Operator
- Using EXCEPT and INTERSECT
- Using APPLY

Module 13: Using Window Ranking, Offset and Aggregate Functions. This module introduces window functions including ranking, aggregate and offset functions. Much of this functionality is new to SQL Server 2012. It will cover the use of T-SQL functions such as ROW_NUMBER, RANK, DENSE_RANK, NTILE, LAG, LEAD, FIRST_VALUE and LAST_VALUE to perform calculations against a set, or window, of rows.

Lessons

- Creating Windows with OVER
- Exploring Window Functions

Module 14: Pivoting and Grouping Sets. This module discusses techniques for pivoting data in T-SQL as well to introduce the fundamentals of the GROUPING SETS clause. It will also cover the use of GROUP BY ROLLUP and GROUP BY CUBE syntax in SQL Server 2012.

Lessons

- Writing Queries with PIVOT and UNPIVOT
- Working with Grouping Sets

Module 15: Querying SQL Server Metadata. This module introduces the use of SQL Server system objects in T-SQL queries. It will cover the use of system catalog views, system stored procedures, system functions, and dynamic management objects.

Lessons

- Querying System Catalog Views and Functions
• Executing System Stored Procedures
• Querying Dynamic Management Objects

Module 16: Executing Stored Procedures. This module introduces the use of existing stored procedures in a T-SQL querying environment. It discusses the use of EXECUTE, how to pass input and output parameters to a procedure, and how to invoke system stored procedures.

Lessons

• Querying Data with Stored Procedures
• Passing Parameters to Stored Procedures
• Creating Simple Stored Procedures
• Working with Dynamic SQL

Module 17: Programming with T-SQL. This module provides a basic introduction to T-SQL programming concepts and objects. It discusses batches, variables, control of flow elements such as loops and conditionals, how to create and execute dynamic SQL statements, and how to use synonyms.

Lessons

• T-SQL Programming Elements
• Controlling Program Flow

Module 18: Implementing Error Handling. This module introduces the use of error handlers in T-SQL code. It will introduce the difference between compile errors and run-time errors, and will cover how errors affect batches. The module will also cover how to control error handling using TRY/CATCH blocks, the use of the ERROR class of functions, and the use of the new THROW statement.

Lessons

• Using TRY / CATCH Blocks
• Working with Error Information

Module 19: Implementing Transactions. This module introduces the concepts of transaction management in SQL Server. It will provide a high-level overview of transaction properties, cover the basics of marking transactions with BEGIN, COMMIT and ROLLBACK.

Lessons

• Transactions and the Database Engine
• Controlling Transactions

Module 20: Improving Query Performance. This module introduces the concepts of system resource usage and the performance impact of querying SQL Server 2012. It will cover, at a high level, the use of indexes in SQL Server, the use of execution plans in SQL Server Management Studio, and the use of SET options to view system resource usage when executing queries. It will also compare set-based operations with cursor-based operations.
Lessons

- Factors in Query Performance
- Displaying Query Performance Data

Module 21: Designing and Implementing Tables. This module explains how to design, create, and alter tables. Also it focuses on working with schemas.

Lessons

- Designing Tables
- Working with Schemas
- Creating and Altering Tables

Module 22: Ensuring Data Integrity through Constraints. This module explains how to enforce data integrity, and implement domain integrity to maintain high quality data. Also it focuses on implementing Entity and Referential Integrity.

Lessons

- Enforcing Data Integrity
- Implementing Domain Integrity
- Implementing Entity and Referential Integrity

Module 23: Planning for SQL Server 2012 Indexing. This module explains the core indexing concepts and effectiveness of each data type commonly used in indexes.

Lessons

- Core Indexing Concepts
- Data Types and Indexes
- Single Column and Composite Indexes

Module 24: Implementing Table Structures in SQL Server 2012. This module explains how tables can be structured in SQL Server databases. Also it focuses on designing and working with clustered indexes.

Lessons

- SQL Server Table Structures
- Working with Clustered Indexes
- Designing Effective Clustered Indexes

Module 25: Reading SQL Server 2012 Execution Plans. This module explains how to design additional indexes. Also it focuses on how to read and interpret execution plans.

Lessons
- Execution Plan Core Concepts
- Common Execution Plan Elements
- Working with Execution Plans

Module 26: Improving Performance through Nonclustered Indexes. This module explains how nonclustered indexes have the potential to significantly enhance the performance of applications and how to use a tool that can help design these indexes appropriately.

Lessons

- Designing Effective Nonclustered Indexes
- Implementing Nonclustered Indexes
- Using the Database Engine Tuning Advisor

Module 27: Designing and Implementing Views. This module introduces Views, and explains how to create and manage Views. Also it focusses on the performance consideration for Views.

Lessons

- Introduction to Views
- Creating and Managing Views
- Performance Considerations for Views

Module 28: Designing and Implementing Stored Procedures. This module describes the potential advantages of the use of stored procedures along with guidelines on creating them.

Lessons

- Introduction to Stored Procedures
- Working With Stored Procedures
- Implementing Parameterized Stored Procedures
- Controlling Execution Context

Module 29: Merging Data and Passing Tables. This module reviews the techniques that provide the ability to process sets of data rather than individual rows. Also it focusses on how these techniques can be used in combination with TABLE parameter types to minimize the number of required stored procedure calls in typical applications.

Lessons

- Using the MERGE Statement
- Implementing Table Types
- Using TABLE Types As Parameters

Module 30: Designing and Implementing User-Defined Functions. This module explains how to design and implement user-defined functions that enforce business rules or data consistency, and modify and maintain existing functions written by other developers.
Lessons

- Overview of Functions
- Designing and Implementing Scalar Functions
- Designing and Implementing Table-Valued Functions
- Implementation Considerations for Functions
- Alternatives to Functions

Module 31: Creating Highly Concurrent SQL Server 2012 Applications. This module explains how to use transactions and the SQL Server locking mechanisms to meet the performance and data integrity requirements of your applications.

Lessons

- Introduction to Transactions
- Introduction to Locks
- Management of Locking
- Transaction Isolation Levels

Module 32: Handling Errors in T-SQL Code. This module explores T-SQL error handling, looks at how it has traditionally been implemented, and how structured exception handling can be used.

Lessons

- Understanding T-SQL Error Handling
- Implementing T-SQL Error Handling
- Implementing Structured Exception Handling

Module 33: Responding to Data Manipulation via Triggers. This module explains what DML triggers are and how they enforce data integrity. Also it focuses on the different types of triggers available, and how to define triggers in a database.

Lessons

- Designing DML Triggers
- Implementing DML Triggers
- Advanced Trigger Concepts

Module 34: Implementing Managed Code in SQL Server 2012. This module explains how to use CLR integrated code to create user-defined database objects that are managed by the .NET Framework.

Lessons

- Introduction to SQL CLR Integration
- Importing and Configuring Assemblies
- Implementing SQL CLR Integration
Module 35: Storing XML Data in SQL Server 2012. This module introduces XML and shows how XML data can be stored within SQL Server.

Lessons

- Introduction to XML and XML Schemas
- Storing XML Data and Schemas in SQL Server
- Implementing the XML Data Type

Module 36: Querying XML Data in SQL Server. This module shows how XML data can be queried, including queries written in a language called XQuery.

Lessons

- Using the T-SQL FOR XML Statement
- Getting Started with XQuery
- Shredding XML

Module 37: Working with SQL Server 2012 Spatial Data. This module introduces Spatial Data, and explains how to work with SQL Server Spatial Data Types.

Lessons

- Introduction to Spatial Data
- Working with SQL Server Spatial Data Types
- Using Spatial Data in Applications

Module 38: Working with Full-Text Indexes and Queries. This module introduces Full-Text Indexing and how to implement Full-Text Indexes in SQL Server.

Lessons

- Introduction to Full-Text Indexing
- Implementing Full-Text Indexes in SQL Server
- Working with Full-Text Queries

Module 39: Preparing Systems for SQL Server 2012. This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.

Lessons

- Overview of SQL Server Architecture
- Planning Server Resource Requirements
- Pre-installation Testing for SQL Server
Module 40: Installing and Configuring SQL Server 2012. This module details installing and configuring SQL Server.

Lessons

- Preparing to Install SQL Server
- Installing SQL Server
- Upgrading and Automating Installation

Module 41: Working with Databases. This module describes how data is stored in databases, how to create databases, and how to move databases either within a server or between servers.

Lessons

- Overview of SQL Server Databases
- Working with Files and Filegroups
- Moving Database Files

Module 42: Understanding SQL Server 2012 Recovery Models. This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server.

Lessons

- Backup Strategies
- Understanding SQL Server Transaction Logging
- Planning a SQL Server Backup Strategy

Module 43: Backup of SQL Server 2012 Databases. This module describes SQL Server Backup and the backup types.

Lessons

- Backing up Databases and Transaction Logs
- Managing Database Backups
- Working with Backup Options

Module 44: Restoring SQL Server 2012 Databases. This module describes the restoration of databases.

Lessons

- Understanding the Restore Process
- Restoring Databases
- Working with Point-in-time recovery
- Restoring System Databases and Individual Files
Module 45: Importing and Exporting Data. This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.

Lessons

- Transferring Data To/From SQL Server
- Importing and Exporting Table Data
- Inserting Data in Bulk

Module 46: Authenticating and Authorizing Users. This module covers SQL Server security models, logins and users.

Lessons

- Authenticating Connections to SQL Server
- Authorizing Logins to Access Databases
- Authorization Across Servers

Module 46: Assigning Server and Database Roles. This module covers fixed server roles, user-defined server roles, fixed database roles and user-defined database roles.

Lessons

- Working with Server Roles
- Working with Fixed Database Roles
- Creating User-defined Database Roles

Module 47: Authorizing Users to Access Resources. This module covers permissions and the assignment of permissions.

Lessons

- Authorizing User Access to Objects
- Authorizing Users to Execute Code
- Configuring Permissions at the Schema Level

Module 48: Auditing SQL Server Environments. This module covers SQL Server Audit.

Lessons

- Options for Auditing Data Access in SQL
- Implementing SQL Server Audit
- Managing SQL Server Audit

Module 49: Automating SQL Server 2012 Management. This module covers SQL Server Agent, jobs and job history.
Lessons

- Automating SQL Server Management
- Working with SQL Server Agent
- Managing SQL Server Agent Jobs

Module 50: Configuring Security for SQL Server Agent. This module covers SQL Server agent security, proxy accounts and credentials.

Lessons

- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

Module 51: Monitoring SQL Server 2012 with Alerts and Notifications. This module covers the configuration of database mail, alerts and notifications.

Lessons

- Configuration of Database Mail
- Monitoring SQL Server Errors
- Configuring Operators, Alerts and Notifications

Module 52: Performing Ongoing Database Maintenance. This module covers database maintenance plans.

Lessons

- Ensuring Database Integrity
- Maintaining Indexes
- Automating Routine Database Maintenance

Module 53: Tracing Access to SQL Server 2012. This module covers SQL Profiler and SQL Trace stored procedures.

Lessons

- Capturing Activity using SQL Server Profiler
- Improving Performance with the Database Engine Tuning Advisor
- Working with Tracing Options

Module 54: Monitoring SQL Server 2012. This module introduces DMVs and the configuration of data collection.

Lessons
• Monitoring Activity
• Capturing and Managing Performance Data
• Analyzing Collected Performance Data

Module 55: Managing Multiple Servers. This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.

Lessons

• Working with Multiple Servers
• Virtualizing SQL Server
• Deploying and Upgrading Data-Tier Applications

Module 56: Troubleshooting Common SQL Server 2012 Administrative Issues. This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.

Lessons

• SQL Server Troubleshooting Methodology
• Resolving Service-related Issues
• Resolving Concurrency Issues
• Resolving Login and Connectivity Issues

Module 57: Introduction to Data Warehousing. This module provides an introduction to the key components of a data warehousing solution and the high-level considerations you must take into account when embarking on a data warehousing project.

Lessons

• Describe data warehouse concepts and architecture considerations
• Considerations for a Data Warehouse Solution

Module 58: Designing and Implementing a Data Warehouse This module describes how to implement the logical and physical architecture of a data warehouse based on industry proven design principles.

Lessons

• Logical Design for a Data Warehouse
• Physical Design for a Data Warehouse

Module 59: Design and implement a schema for a data warehouse This module discusses considerations for implementing an ETL process, and then focuses on SQL Server Integration Services (SSIS) as a platform for building ETL solutions.

Lessons
• Introduction to ETL with SSIS
• Exploring Source Data
• Implementing Data Flow

Module 60: Implementing Control Flow in an SSIS Package. This module describes how to implement control flow which allows users to design robust ETL processes for a data warehousing solution that coordinate data flow operations with other automated tasks.

Lessons

• Introduction to Control Flow
• Creating Dynamic Packages
• Using Containers
• Managing Consistency

Module 61: Debugging and Troubleshooting SSIS Packages. This module describes how you can debug packages to find the cause of errors that occur during execution. It then discusses the logging functionality built into SSIS that you can use to log events for troubleshooting purposes. Finally, the module describes common approaches for handling errors in control flow and data flow.

Lessons

• Debugging an SSIS Package
• Logging SSIS Package Events
• Handling Errors in an SSIS Package

Module 62: Implementing an Incremental ETL Process. This module describes the techniques you can use to implement an incremental data warehouse refresh process.

Lessons

• Introduction to Incremental ETL
• Extracting Modified Data
• Loading Modified Data

Module 63: Incorporating Data from the Cloud in a Data Warehouse. This module describes how integrate cloud data into a data warehouse ecosystem.

Lessons

• Overview of Cloud Data Sources
• SQL Server Azure
• Azure Data Market

Module 64: Enforcing Data Quality. This module describes how to use Data Quality Services (DQS) for
cleansing and deduplicating your data.

Lessons

- Introduction to Data Cleansing
- Using Data Quality Services to Cleanse Data
- Using Data Quality Services to Match Data

Module 65: Using Master Data Services. This module introduces Master Data Services and explains the benefits of using it in a business intelligence (BI) context. It also describes the key configuration options, explains how to import and export data and apply rules that help to preserve data integrity, and introduces the new Master Data Services Add-in for Excel.

Lessons

- Master Data Services Concepts
- Implementing a Master Data Services Model
- Using the Master Data Services Excel Add-in

Module 66: Extending SSIS. This module describes how to extend SSIS by using custom scripts and components.

Lessons

- Using Custom Components in SSIS
- Using Scripting in SSIS

Module 67: Deploying and Configuring SSIS Packages. This module describes how to deploy and configure SSIS packages.

Lessons

- Overview of Deployment
- Deploying SSIS Projects
- Planning SSIS Package Execution

Module 68: Consuming Data in a Data Warehouse. This module describes how information workers can consume data from the data warehouse.

Lessons

- Using Excel to Analyze Data in a data Warehouse.
- An Introduction to PowerPivot
- An Introduction to Crescent
The Microsoft Certified Solutions Associate (MCSA): Windows Server 2012 certification shows that you have the primary set of Windows Server skills that are relevant across multiple solution areas in a business environment. The MCSA: Windows Server 2012 certification is a prerequisite for earning the MCSE: Server Infrastructure certification, the MCSE: Desktop Infrastructure certification, or the MCSE: Private Cloud certification. This foundational certification validates your ability to work with Windows Server 2012 in a real-world business context.

**MCSA Candidate Profile**

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA Windows Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

**MCSA Server 2012**

This primary goal of this course is to help each student pass the exams required to earn the MCSA Windows Server 2012 certification. To do this, our knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

**Course Outline**

**Module 1: Deploying and Managing Windows Server 2012**

This module introduces students to the editions of Windows Server 2012 and the new Windows Server 2012 management tools. It also covers how to install Windows Server 2012, how to perform post-deployment tasks, and how to perform basic administrative tasks.

**Lessons**

- Windows Server 2012 Overview
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Overview of Windows Server 2012 Management
- Introduction to Windows PowerShell

**Module 2: Introduction to Active Directory Domain Services.**
This module covers the structure of Active Directory Domain Services (AD DS) and its various components, such as forest, domain, and organizational units (OUs). It also gives an overview of domain controllers, in addition to choices that are available with Windows Server 2012 for installing AD DS on a server.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects
This module describes how to manage user accounts and computer accounts, including how to manage various consumer devices that employees use. The module also covers how to manage an enterprise network by managing groups, and how to delegate administrative tasks to designated users or groups.

Lessons

- Managing User Accounts
- Managing Groups
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration.
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell

Module 5: Implementing IPv4
This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks. In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

Module 6: Implementing Dynamic Host Configuration Protocol
This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing DNS
This module describes name resolution for Windows operating system clients and Windows Server servers. It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6
This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Module 9: Implementing Local Storage
This module introduces several different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services
This module discusses how to provide file and print resources with Windows Server 2012. It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

Module 11: Implementing Group Policy
This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates

Module 12: Securing Windows Servers Using Group Policy Objects
This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

- Security Overview for Windows Operating Systems
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Configuring and Troubleshooting Domain Name System
This module explains how to configure and troubleshoot DNS, including DNS replication and caching.

Lessons

- Configuring the DNS Server Role
- Configuring DNS Zones
Module 15: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODCs
- Administering AD DS
- Managing the AD DS Database

Module 16: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts. It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons

- Configuring Password Policy and User Account Lockout Settings
- Configuring Managed Service Accounts

Module 17: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

- Introducing Group Policy
- Implementing and Administering GPOs
- Group Policy Scope and Group Policy Processing
- Troubleshooting the Application of GPOs

Module 18: Managing User Desktops with Group Policy
This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

- Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

Module 19: Installing, Configuring, and Troubleshooting the Network Policy Server Role
This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describe NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons
• Installing and Configuring a Network Policy Server
• Configuring RADIUS Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a Network Policy Server

Module 20: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons
• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Configuring IPSec Enforcement for NAP
• Monitoring and Troubleshooting NAP

Module 21: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons
• Overview of Remote Access
• Implementing DirectAccess by Using the Getting Started Wizard
• Implementing and Managing an Advanced DirectAccess Infrastructure
• Implementing VPN
• Implementing Web Application Proxy

Module 22: Optimizing File Services
This module describes FSRM, configure quotas, file screening, and storage reports and implement classification management and file management tasks. It describes the components of the DFS. I also explains how to configure DFS namespaces and DFS replication.

Lessons
• Overview of FSRM
• Using FSRM to Manage Quotas, File Screens, and Storage Reports
• Implementing Classification and File Management Tasks
• Overview of DFS
• Configuring DFS Namespaces
• Configuring and Troubleshooting DFS Replication

Module 23: Configuring Encryption and Advanced Auditing
This module explains how to encrypt files using EFS and configure advanced auditing features.

Lessons

• Encrypting Drives by Using BitLocker
• Encrypting Files by Using EFS
• Configuring Advanced Auditing

Module 24: Deploying and Maintaining Server Images
This module explains how to create and manage server images by using Windows Deployment Services

Lessons

• Overview of Windows Deployment Services
• Managing Images
• Implementing Deployment with Windows Deployment Services
• Administering Windows Deployment Services

Module 25: Implementing Update Management
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

Lessons

• Overview of WSUS
• Deploying Updates with WSUS

Module 26: Monitoring Windows Server 2012
This module explains the monitoring tools available in Windows Server 2012. It also explains how to use Performance Monitor and monitor events.

Lessons

• Monitoring Tools
• Using Performance Monitor
• Monitoring Event Logs

Module 27: Implementing Advanced Network Services
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

**Module 28: Implementing Advanced File Services**
In this module students will be able to configure file services to meet advanced business requirements.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

**Module 29: Implementing Dynamic Access Control**
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

**Module 30: Implementing Distributed Active Directory Domain Services Deployments**
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

**Module 31: Implementing Active Directory Domain Services Sites and Replication**
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons
• AD DS Replication Overview
• Configuring AD DS Sites
• Configuring and Monitoring AD DS Replication

Module 32: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons

• Using Certificates in a Business Environment
• PKI Overview
• Deploying CAs
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Module 35: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

**Module 36: Implementing Failover Clustering**
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

**Module 37: Implementing Failover Clustering with Hyper-V**
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement

**Module 38: Implementing Business Continuity and Disaster Recovery**
In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements

Lessons

• Data Protection Overview
• Implementing Windows Server Backup
• Implementing Server and Data Recovery
MCSA Server 2012 Boot Camp

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This module introduces students to the editions of Windows Server 2012 and the new Windows Server 2012 management tools. It also covers how to install Windows Server 2012, how to perform post-deployment tasks, and how to perform basic administrative tasks.

Lessons

- Windows Server 2012 Overview
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Overview of Windows Server 2012 Management
- Introduction to Windows PowerShell

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Lessons

- Overview of AD DS
- Overview of Domain Controllers
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This module describes how to manage user accounts and computer accounts, including how to manage various consumer devices that employees use. The module also covers how to manage an enterprise network by managing groups, and how to delegate administrative tasks to designated users or groups.

Lessons

- Managing User Accounts
- Managing Groups
- Managing Computer Accounts
- Delegating Administration

**Module 4: Automating Active Directory Domain Services Administration.**
This module describes how to use command-line tools and Windows PowerShell to automate AD DS administration. It discusses various command-line tools and Windows PowerShell commands, and then describes how to use these tools and commands to modify objects individually and in bulk operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell

**Module 5: Implementing IPv4**
This module discusses using IPv4, which is the network protocol used on the Internet and on local area networks. In this module, students learn how to implement an IPv4 addressing scheme and how to troubleshoot network communication. This module also covers how to determine and troubleshoot network-related problems.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

**Module 6: Implementing Dynamic Host Configuration Protocol**
This module covers supporting and troubleshooting a Windows Server–based network infrastructure by deploying, configuring, and troubleshooting the Dynamic Host Configuration Protocol (DHCP) server role.

Lessons

- Overview of the DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing DNS

This module describes name resolution for Windows operating system clients and Windows Server servers. It also covers installing and configuring a DNS Server service and its components.

Lessons

- Name Resolution for Windows Clients and Servers
- Installing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6

This module discusses the features and benefits of IPv6, how IPv6 affects IPv4 networks, and how to integrate IPv6 into IPv4 networks by using various transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv4
- IPv6 Transition Technologies

Module 9: Implementing Local Storage

This module introduces several different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use the new Storage Spaces feature, which enables you to combine disks into pools that you can configure for automatic management.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services

This module discusses how to provide file and print resources with Windows Server 2012. It describes how to secure files and folders, how to protect previous versions of files and folders by using shadow copies, and how to give workers remote access to corporate files by implementing the new Work Folders role service. It also describes new network printing features that help manage the network printing environment.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Work Folders
- Configuring Network Printing

Module 11: Implementing Group Policy
This module provides an overview of Group Policy and provides details about how to implement Group Policy.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates

Module 12: Securing Windows Servers Using Group Policy Objects
This module describes Windows Server 2012 operating system security. It covers how to identify security threats, plan your strategy to mitigate security threats, and secure your Windows Server 2012 infrastructure.

Lessons

- Security Overview for Windows Operating Systems
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V
This module describes virtualization technologies available on Windows, specifically focusing on the Hyper-V role in Windows Server 2012 and Windows Server 2012 R2. It covers the components of the Hyper-V role, configuring and deploying the role, in addition to and how to configure and manage key components of a Hyper-V implementation, such as Storage and Networking.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Configuring and Troubleshooting Domain Name System
This module explains how to configure and troubleshoot DNS, including DNS replication and caching.

Lessons

- Configuring the DNS Server Role
- Configuring DNS Zones
• Configuring DNS Zone Transfers
• Managing and Troubleshooting DNS

Module 15: Maintaining Active Directory Domain Services
This module explains how to implement virtualized domain controllers and read-only domain controller (RODCs). It also explains how to perform common AD DS administrative tasks and manage the AD DS Database.

Lessons

• Overview of AD DS
• Implementing Virtualized Domain Controllers
• Implementing RODCs
• Administering AD DS
• Managing the AD DS Database

Module 16: Managing User and Service Accounts
This module explains how to create, configure and automate the creation of user accounts. It also explains how to configure account-related properties of user objects. It further explains how to create and administer Managed Service Accounts.

Lessons

• Configuring Password Policy and User Account Lockout Settings
• Configuring Managed Service Accounts

Module 17: Implementing a Group Policy Infrastructure
This module explains how to implement a GPO infrastructure. This also teaches how to perform common GPO management tasks, and manage GPOs by using Windows PowerShell. It also focuses on troubleshooting the application of GPOs.

Lessons

• Introducing Group Policy
• Implementing and Administering GPOs
• Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

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This module explains how you can use Group Policy Objects (GPOs) to implement desktop environments across your organization by using Administrative Templates, Folder Redirection, Group Policy preferences, and where applicable, use software deployment to install and update application programs. It is important to know how to use these various GPO features so that you can configure your users’ computer settings properly.

Lessons

• Implementing Administrative Templates
Module 19: Installing, Configuring, and Troubleshooting the Network Policy Server Role
This module explains how to install and configure NPS, RADIUS Clients and servers. It also describes NPS authentication methods. It describes NPS authentication methods and how to monitor and troubleshoot NPS.

Lessons

- Installing and Configuring a Network Policy Server
- Configuring RADIUS Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a Network Policy Server

Module 20: Implementing Network Access Protection
This module explains how to configure, monitor, and troubleshoot NAP. It also explains how NAP can help to protect your network and the various NAP enforcement processes.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Configuring IPSec Enforcement for NAP
- Monitoring and Troubleshooting NAP

Module 21: Implementing Remote Access
In this module, you will learn how to implement and manage remote access in Windows Server 2012. You will also learn how to implement DirectAccess by using the Getting Started wizard, implement and manage an advanced DirectAccess infrastructure, and implement VPN.

Lessons

- Overview of Remote Access
- Implementing DirectAccess by Using the Getting Started Wizard
- Implementing and Managing an Advanced DirectAccess Infrastructure
- Implementing VPN
- Implementing Web Application Proxy

Module 22: Optimizing File Services
This module describes FSRM, configure quotas, file screening, and storage reports and implement classification management and file management tasks. It describes the components of the DFS. I also explains how to configure DFS namespaces and DFS replication.

Lessons
• Overview of FSRM
• Using FSRM to Manage Quotas, File Screens, and Storage Reports
• Implementing Classification and File Management Tasks
• Overview of DFS
• Configuring DFS Namespaces
• Configuring and Troubleshooting DFS Replication

Module 23: Configuring Encryption and Advanced Auditing
This module explains how to encrypt files using EFS and configure advanced auditing features.

Lessons

• Encrypting Drives by Using BitLocker
• Encrypting Files by Using EFS
• Configuring Advanced Auditing

Module 24: Deploying and Maintaining Server Images
This module explains how to create and manage server images by using Windows Deployment Services

Lessons

• Overview of Windows Deployment Services
• Managing Images
• Implementing Deployment with Windows Deployment Services
• Administering Windows Deployment Services

Module 25: Implementing Update Management
This module explains how to use Windows Server Update Services (WSUS) to deploy updates to Windows servers and clients.

Lessons

• Overview of WSUS
• Deploying Updates with WSUS

Module 26: Monitoring Windows Server 2012
This module explains the monitoring tools available in Windows Server 2012. it also explains how to use Performance Monitor and monitor events.

Lessons

• Monitoring Tools
• Using Performance Monitor
• Monitoring Event Logs

Module 27: Implementing Advanced Network Services
In this module students will be able to configure advanced features for Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and configure IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
- Managing IP Address Spaces with IPAM

**Module 28: Implementing Advanced File Services**
In this module students will be able to configure file services to meet advanced business requirements.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

**Module 29: Implementing Dynamic Access Control**
In this module students will be able to configure Dynamic Access Control (DAC) to manage and audit access to shared files.

Lessons

- Overview of DAC
- Implementing DAC Components
- Implementing DAC for Access Control
- Implementing Access Denied Assistance
- Implementing and Managing Work Folders

**Module 30: Implementing Distributed Active Directory Domain Services Deployments**
In this module students will be able to plan and implement an Active Directory Domain Services (AD DS) deployment that includes multiple domains and forests.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

**Module 31: Implementing Active Directory Domain Services Sites and Replication**
In this module students will be able to plan and implement an AD DS deployment that includes multiple locations.

Lessons
• AD DS Replication Overview
• Configuring AD DS Sites
• Configuring and Monitoring AD DS Replication

Module 32: Implementing AD CS
In this module students will be able to implement an Active Directory Certificate Services (AD CS) deployment.

Lessons

• Using Certificates in a Business Environment
• PKI Overview
• Deploying CAs
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services
In this module students will be able to implement an AD RMS deployment.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing and Administering AD FS
In this module students will be able to implement an Active Directory Federation Services (AD FS) deployment.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a Business-to-Business Federation Scenario
• Extending AD FS to External Clients

Module 35: Implementing Network Load Balancing
In this module students will be able to provide high availability and load balancing for web-based applications by implementing Network Load Balancing (NLB).

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering
In this module students will be able to provide high availability for network services and applications by implementing failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V
In this module students will be able to deploy and manage Hyper-V virtual machines in a failover cluster.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement

Module 38: Implementing Business Continuity and Disaster Recovery
In this module students will be able to implement a backup and disaster recovery solution based on business and technical requirements.

Lessons

• Data Protection Overview
• Implementing Windows Server Backup
• Implementing Server and Data Recovery
Windows Server 2012 Boot Camp

About this Course

The Microsoft Certified Solutions Associate (MCSA): Windows Server 2012 certification Show that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSA: Windows Server 2012 certification will qualify you for a position as a network or computer systems administrator or a computer support specialist. The MCSA: Windows Server 2012 certification is a prerequisite for earning the MCSE: Server Infrastructure certification.

MCSA Candidate Profile

The MCSA certification is for IT professionals either looking to get their first job in Microsoft technology or to document their existing skill sets. This boot camp is intended for students seeking to earn the MCSA Windows Server 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSA: Windows Server 2012

The primary goal of this program is to help each student pass the exams required to earn the MCSA Windows Server 2012 certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

• Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement
• Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

• Overview of Disaster Recovery
• Implementing Windows Server Backup
• Implementing Server and Data Recovery
About this Course

This 14-day instructor-led course provides you with the skills and knowledge needed to plan, design, and implement a Windows 8 desktop infrastructure. The course provides guidance on planning and deploying desktops by using several technologies such as User State Migration Tool (USMT), Microsoft Deployment Toolkit (MDT), Virtual Desktop Infrastructure (VDI), and more. Additionally, the course describes how to protect desktops and monitor their health and performance, build the skills you need to design, deploy, and manage a physical and virtual Windows Server 2012 application management infrastructure, and focus on using Microsoft System Center 2012 Service Pack 1 (SP1). You will also learn to design, deploy, and manage Windows 8 Enterprise applications in a physical and virtual environment and in the cloud.

MCSE Candidate Profile

This course is intended for Information Technology professionals who are interested in specializing in Windows 8 application deployments and managing the application environments for large organizations. People attending this training could be support technicians or currently in deployment roles and are considering taking the next step in their career or enhancing their skills in the areas of planning and deploying Windows 8 desktops.

At Course Completion

- Plan an image management strategy.
- Implement desktop security.
- Capture and manage a desktop operating system image.
- Plan and implement User State Migration.
- Plan and deploy desktops by using the Microsoft Deployment Toolkit.
- Plan and deploying desktops by using System Center 2012 Configuration Manager.
- Plan and implement a Remote Desktop Services infrastructure.
- Manage user state virtualization for enterprise desktops.
- Plan and implement an updates infrastructure to support enterprise desktops.
- Protect enterprise desktops from malware and data loss.
- Monitoring the performance and health of the desktop infrastructure. Design an application distribution strategy that is appropriate for an organizational environment.
- Diagnose and remediate application compatibility problems for desktop and presentation virtualization-based deployments.
- Use Group Policy and Windows Intune to deploy applications to client devices.
Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell

Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.
Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

**Module 4: Automating Active Directory Domain Services Administration.** This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell

**Module 5: Implementing IPv4.** This module covers Internet Protocol Version 4 (IPv4) addressing. It details the various IPv4 components, covers subnetting and supernetting, and discusses configuring and general troubleshooting of IPv4 addresses.

Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4

**Module 6: Implementing Dynamic Host Configuration Protocol.** This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP
Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

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- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.
Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
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Lessons

• Installing the DNS Server Role
• Configuring the DNS Server Role
• Configuring DNS Zones
• Configuring DNS Zone Transfers
• Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

• Overview of AD DS
• Implementing Virtualized Domain Controllers
• Implementing RODC
• Administering AD DS
• Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

• Automating User Account Management
• Configuring Password-Policy and User-Account Lockout Settings
• Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

• Introducing Group Policy
• Implementing and Administering Group Policy Objects (GPOs)
• Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.
Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

Module 24: Configuring Encryption and Advanced Auditing. This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

Module 25: Implementing Update Management. This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

Module 26: Monitoring Windows Server 2012. This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

Module 27: Implementing Advanced Network Services. This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.
Lessons

- PKI Overview
- Deploying CAs
- Deploying and Configuring CA Hierarchy
- Deploying and Managing Certificate Templates
- Implementing Certificate Distribution and Revocation
- Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation
Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons
- Overview of Failover Clustering
- Implementing a Failover Cluster
- Configuring Highly Available Applications and Services on a Failover Cluster
- Maintaining a Failover Cluster
- Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons
- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons
- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Assessing and Determining Desktop Deployment Options. This module describes the enterprise desktop lifecycle and explains how you can assess hardware and infrastructure readiness. The module then describes how to identify and select the most appropriate deployment option based upon organizational requirements.

Lessons
- Overview of the Enterprise Desktop Life Cycle
• Assessing Hardware and Infrastructure Readiness for a Desktop Deployment
• Using MAP to Assess Deployment Readiness
• Overview of Enterprise Desktop Deployment Methods
• Volume Activation Technologies for Enterprise Desktops

**Module 40: Planning An Image Management Strategy.** This module describes Windows image formats and helps you to define an efficient image management strategy based upon business requirements.

**Lessons**

• Overview of Windows Image Format
• Overview of Image Management

**Module 41: Implementing Desktop Security.** This module describes how to deploy and manage a secure desktop by implementing centralized policies, BitLocker settings, and Encrypted File System (EFS) settings.

**Lessons**

• Implementing a Centralized Desktop Security Solution
• Planning and Implementing BitLocker
• Planning and Implementing EFS

**Module 42: Capturing and Managing a Desktop Operating System Image.** This module describes how to use the Windows Assessment and Deployment Kit (ADK) and Windows Deployment Services (WDS) to create, capture, and manage a desktop operating system image.

**Lessons**

• Overview of Windows ADK
• Managing Windows PE
• Building a Reference Image by Using Windows SIM and Sysprep
• Capturing and Servicing a Reference Image
• Configuring and Managing Windows DS

**Module 43: Planning and Implementing User State Migration.** This module describes how to use the User State Migration Tool (USMT) to migrate appropriate user data and settings to a new desktop operating system.
Lessons

- Overview of User State Migration
- Planning User State Migration by Using USMT
- Migrating User State by Using USMT

Module 44: Planning and Deploying Desktops Using the Microsoft Deployment Toolkit. This module describes how to use the Microsoft Deployment Toolkit (MDT) 2012 to deploy Windows operating systems in lite touch installation scenarios.

Lessons

- Planning for the LTI Environment
- Implementing MDT 2012 for LTI
- Integrating Windows DS with MDT

Module 44: Planning and Deploying Desktops by Using System Center 2012 Configuration Manager. This describes how to use System Center 2012 Configuration Manager to implement a zero touch installation for deploying enterprise desktops.

Lessons

- Planning the ZTI Environment
- Preparing the Site for Operating System Deployment
- Building a Reference Image by Using a Configuration Manager Task Sequence
- Deploying Client Images by Using MDT Task Sequences

Module 45: Planning and Implementing a Remote Desktop Services Infrastructure. This module describes how to plan and implement session virtualization deployment and a virtual desktop infrastructure (VDI) based upon Windows Server 2012 Remote Desktop Services.

Lessons

- Overview of Remote Desktop Services
- Planning the Remote Desktop Services Environment
- Configuring a Virtual Machine–Based Desktop Infrastructure Deployment
- Configuring a Session-Based Desktop Deployment
- Extending the Remote Desktop Services Environment to the Internet

Module 46: Managing User State Virtualization For Enterprise Desktops. This module describes how to plan and configure user state virtualization to provide a consistent desktop
client experience.

Lessons

- Overview of User State Virtualization
- Planning User State Virtualization
- Configuring Roaming Profiles, Folder Redirection, and Offline Files
- Implementing UE-V

Module 47: Planning and Implementing an Updates Infrastructure to Support Enterprise Desktops. Students will be able to plan and implement an updates infrastructure to support both physical and virtual enterprise desktops.

Lessons

- Planning an Updates Infrastructure for the Enterprise
- Supporting Software Updates with System Center 2012 Configuration Manager
- Managing Updates for Virtual Machines and Images
- Using Windows Intune for Managing Software Updates

Module 48: Protecting Enterprise Desktops from Malware and Data Loss. This module describes how to use System Center technologies such as Endpoint protection and Data Protection Manager (DPM) to protect enterprise desktops from malware and data loss.

Lessons

- Overview of System Center 2012 Endpoint Protection
- Configuring System Center 2012 Endpoint Protection Client Settings and Monitoring Status
- Using Windows Intune Endpoint Protection
- Protecting Desktops by Using DPM

Module 49: Monitoring the Performance and Health of the Desktop Infrastructure. This module describes how to identify and monitor relevant services and components to ensure the health and performance of the enterprise desktop infrastructure.

Lessons

- Performance and Health Monitoring for the Desktop Infrastructure Monitoring VDI
Module 50: Designing an Application Distribution Strategy. This module discusses the high-level aspects of designing an application distribution strategy. The topics covered can help students identify the aspects in an environment that influence application distribution and identify the most common distribution methods used in the Windows environment.

Lessons

• Developing an Application Lifecycle Strategy
• Determining Business Requirements for Application Distribution
• Overview of Application Distribution Strategies

Module 51: Diagnosing and Remediating Application Compatibility. This module describes the process for addressing common application compatibility issues experienced during a new operating system deployment. The module also explains how to use Microsoft Application Compatibility Toolkit (ACT) to help inventory, analyze, and mitigate application compatibility issues.

Lessons

• Diagnosing Application Compatibility Issues
• Evaluating and Implementing Remediation Solutions
• Resolving Compatibility Issues by Using ACT

Module 52: Deploying Software by Using Group Policy and Windows Intune. This module discusses using Group Policy and Windows Intune to deploy software as part of a software deployment strategy. It also covers side loading, which is the specialized software deployment method specific to Windows Store apps.

Lessons

• Deploying Software by Using Group Policy
• Side loading Windows Store Apps
• Deploying Software by Using Windows Intune

Module 53: Deploying Applications by Using Microsoft System Center 2012 Configuration Manager SP1. This module describes how to use System Center 2012 Configuration Manager SP1 to manage the software deployment and management lifecycle, including deploying software, targeting a group of user or computers, validating the success of software deployment, and removing software from computers when that software is no longer required.
Lessons

- Understanding Software Deployment by Using System Center 2012 Configuration Manager SP1
- Deploying Software by Using System Center 2012 Configuration Manager SP1

Module 54: Configuring Self-Service Application Deployment. This module describes planning, configuring and using self-service application deployment. It describes configuring self-service application deployment for Windows Intune clients and for Microsoft System Center 2012 Configuration Manager clients, in addition to using Microsoft System Center 2012 - Service Manager and Microsoft System Center 2012 - Orchestrator to improve the self-service application deployment process.

Lessons

- Understanding Self-Service Application Deployment
- Configuring Self-Service with Windows Intune
- Self-Service Deployment by Using System Center 2012 Configuration Manager SP1
- Self-Service Deployment with Service Manager and Orchestrator

Module 55: Designing and Implementing Presentation Virtualization Infrastructure. This module introduces you to presentation virtualization concepts and to the components that are used for presentation virtualization in computers running Windows so that you can plan the deployment of apps using presentation virtualization in your environment.

Lessons

- Assessing Presentation Virtualization Requirements
- Planning Presentation Virtualization Infrastructure
- Deploying Presentation Virtualization Infrastructure
- Extending the Presentation Virtualization Infrastructure

Module 56: Preparing, Configuring, and Deploying Presentation Virtualization Applications. This module discusses presentation virtualization strategies and which strategy to use in a given situation. It also discusses how to deploy applications to Remote Desktop Session Host servers as traditional, RemoteApp, and Remote Desktop Web Access applications.
Lessons

- Determining Presentation Virtualization Application Strategies
- Planning and Deploying Remote Desktop, RemoteApp, and Remote Desktop Web Access

Module 57: Designing and Deploying an Application Virtualization Environment. This module discusses how to determine which application virtualization infrastructure model best suits an organization’s needs. Additionally, this module covers how to determine which Windows Server 2012 roles and features are needed to support the model you have selected, and which Group Policy settings should be configured.

Lessons

- Overview of Application Virtualization Models
- Deploying Application Virtualization Infrastructure Components
- Configuring Application Virtualization Client Support

Module 58: Preparing, Sequencing, and Deploying Virtual Applications. This module describes sequencing applications by using the Microsoft Application Virtualization (App-V) Sequencer. It also describes how to stream sequenced applications and how to locally install sequenced applications.

Lessons

- Sequencing Applications with App-V
- Deploying App-V Applications

Module 59: Planning and Implementing Application Updates and Security. This module discusses how to configure the appropriate infrastructure to streamline the deployment of software updates to applications. It also covers how to plan and configure application security.

Lessons

- Planning Application Updates
- Deploying Updates by Using WSUS
- Deploying Application Updates by Using System Center 2012 Configuration Manager SP1
• Implementing Application Security

Module 60: Planning and Implementing Application Upgrades. This module covers planning and implementing application upgrades and supersedence, including how to deploy multiple versions of an application, how to uninstall applications, how to retire applications, and how to manage user settings. It also covers planning application concurrency and implementing it by using App-V, Client Hyper-V, RemoteApp, VDI, and Remote Desktop Services.

Lessons

• Overview of Application Upgrades
• Overview of Application Concurrency

Module 61: Monitoring Application Deployment, Use, and Performance. This module describes using application monitoring as an essential part of managing applications in an enterprise environment. It also covers planning software inventory and metering, and monitoring application resource use.

Lessons

• Planning Application Monitoring
• Planning Software Inventory and Metering
• Monitoring Application Resource Utilization
About this Course

The Microsoft Certified Solutions Expert (MCSE): Windows Server 2012 certification shows that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSE: Private Cloud certification will qualify you for such jobs as server administrator, systems programmer, and network manager.

MCSE Candidate Profile

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment.

MCSE: Private Cloud

The primary goal of this program is to help each student pass the exams required to earn the MCSE Windows Private Cloud. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

Module 24: Configuring Encryption and Advanced Auditing. This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

Module 25: Implementing Update Management. This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

Module 26: Monitoring Windows Server 2012. This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

Module 27: Implementing Advanced Network Services. This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs  
• Deploying and Configuring CA Hierarchy  
• Deploying and Managing Certificate Templates  
• Implementing Certificate Distribution and Revocation  
• Managing Certificate Recovery  

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

• AD RMS Overview  
• Deploying and Managing an AD RMS Infrastructure  
• Configuring AD RMS Content Protection  
• Configuring External Access to AD RMS  

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

• Overview of AD FS  
• Deploying AD FS  
• Implementing AD FS for a Single Organization  
• Deploying AD FS in a B2B Federation Scenario  

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

• Overview of NLB  
• Configuring an NLB Cluster  
• Planning an NLB Implementation  

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement
• Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

• Overview of Disaster Recovery
• Implementing Windows Server Backup
• Implementing Server and Data Recovery

Module 39: Introduction to the Private Cloud This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012. Lessons

• Overview of the Cloud Computing Model
• Requirements for the Private Cloud
• Operating a Private Cloud Infrastructure with System Center
• Maintaining the Health of the Private Cloud
• Integrating System Center Components
• Verifying the Compliance of the Private Cloud Infrastructure

Lab: Verifying the Private Cloud Infrastructure

• Verifying the Infrastructure
• Verifying System Center Components
Lab : Verifying the Compliance of the Private Cloud Infrastructure

- Exercise: Checking Compliance

After completing this module, students will be able to:

- Describe the features of a cloud computing model.
- Describe the requirements for the private cloud.
- Describe how you can use System Center to monitor and manage the private cloud.
- Describe how to maintain the health of the private cloud infrastructure.
- Describe how to integrate System Center components.
- Verify the compliance of the private cloud infrastructure.

Module 40: Configuring and Optimizing Business Unit Clouds

This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons: Overview of System Center Virtual Machine Manager

- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Lab : Configuring and Optimizing Business Unit Clouds

- Configuring Network Resources
- Creating the Business Unit Cloud
- Configuring Security

After completing this module, students will be able to:

- Describe the core components, key features, architecture, and security features of Virtual Machine Manager, and the role it plays in the private cloud.
- Use Virtual Machine Manager to manage private cloud infrastructure.
- Describe how to build and configure resources and security for a business unit cloud.

Module 41: Deploying Cloud Services

This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons

- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
• Data-Tier Application Packages

Lab: Importing and Deploying the Stock Trader Application

• Deploying a Single Tier Service
• Configuring Prerequisites
• Preparing the Stock Trader Service Template
• Deploying the Service Template

After completing this module, students will be able to:

• Create service templates in VMM by using the Service Template Designer.
• Describe the process of creating VMM profiles.
• Describe the process of creating Web Deploy packages.
• Describe the process of sequencing by using Server App-V.
• Describe the process of creating data-tier application packages.

Module 42: Monitoring Private Cloud Services This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

Lessons

• Overview of System Center Operations Manager
• Agent Deployment in Operations Manager
• Configuring Custom Monitoring
• Monitoring the Network Infrastructure
• Monitoring Distributed Applications

Lab: Monitoring Private Cloud Services

• Deploying an Agent
• Configuring Custom Monitoring
• Creating a Distributed Application Model
• Detecting and Recovering from a Failure

After completing this module, students will be able to:

• Describe the key features of Operations Manager.
• Describe the architecture of Operations Manager, including databases, management servers, management server pools, consoles, gateways, and reporting.
• Describe how to secure access to Operations Manager by using User Roles.

**Module 43: Configuring Application Performance Monitoring**

This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.

**Lessons**

- Application Performance Monitoring
- Advanced Monitoring in Application Performance Monitoring
- Viewing Application Performance in Operations Manager

**Lab : Configuring Application Performance Monitoring**

- Configuring Basic Monitoring in Application Performance Monitoring
- Customizing the Performance Thresholds
- Validating Monitoring
- Creating a Distributed Application Model for the Dinner Now Application

After completing this module, students will be able to:

- Describe the core components in APM and the best practices when implementing them.
- Describe how to implement advanced monitoring features that are available in APM.
- Describe how to view application performance in Operations Manager.

**Module 44: Operating and Extending Service Management in the Private Cloud**

This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes about the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

**Lessons**

- Overview of Service Manager
- Configuring Security and User Roles
- Configuring Work Items
• Configuring Incident Queues
• Configuring Service Offerings

**Lab : Operating and Extending Service Management in the Cloud**

• Configuring Security Roles
• Configuring Notifications
• Publishing an Incident Service Offering
• Raising an Incident
• Creating an Approving a Change Request
• Creating an Assigning a Release Record

After completing this module, students will be able to:

• Describe Service Manager.
• Describe configuring security and user roles.
• Describe configuring work items.
• Describe configuring incident queues.
• Describe configuring service offerings.

**Module 45: Automatic Incident Creation, Remediation, and Change Requests** This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

**Lessons**

• Overview of System Center Orchestrator 2012
• Integrating Orchestrator with Operations Manager and Service Manager

**Lab : Automating Incident Creation, Remediation, and Change Requests**

• Configuring the Incident Template
• Configuring Incidents That Affect the StockTrader Service
• Automating Incident Remediation and Change Requests

After completing this module, students will be able to:

• Describe the Orchestrator components and the available Integration Packs.
• Integrate Orchestrator with Operations Manager and Service Manager.

**Module 46: Problem Management in the Private Cloud** This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in
Operations Manager and then use it to identify and route incidents and problems to Service Manager.

**Lessons**

- Overview of Problem Management
- Creating Custom Rules

**Lab: Automating Problem Management in the Private Cloud**

- Manually Creating a Problem Record
- Creating a Custom Event Rule in Operations Manager
- Configuring Automated Problem Record Creation

After completing this module, students will be able to:

- Describe problem management.
- Create custom rules.

**Module 47: Automating Self-Service Provisioning**

This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

**Lessons**

- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

**Lab: Automating Self-Service Provisioning**

- Completing the Prerequisites for the System Center Cloud Services Process Pack
- Installing the System Center Cloud Services Process Pack
- Configuring the System Center Cloud Services Process Pack
- Deploying a Virtual Machine for StockTrader by using the Cloud Services Process Pack

After completing this module, students will be able to:

- Describe how to install and configure the System Center Cloud Services Process Pack.
- Describe the various Cloud Services configuration items that make up the System Center Cloud Service Process Pack.
• Describe the various Cloud Services request items that are included in the System Center Cloud Services Process Pack.

**Module 48: Private Cloud Protection and Recovery** This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database

**Lessons**

• Protecting Data in the Private Cloud
• Recovering Data in the Private Cloud

**Lab : Private Cloud Protection and Recovery**

• Configuring Manual Protection and Recovery of Key Service Data
• Configuring Automatic Protection and Recovery of Key Service Data
• Monitoring Protection Status

After completing this module, students will be able to:

• Configure data protection in the private cloud.
• Configure data recovery in the private cloud.

**Module 49: Configuring Compliance in the Private Cloud** This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

**Lessons**

• Overview of the Process Pack for IT GRC
• Installing and Configuring the Process Pack for IT GRC
• Implementing an IT GRC Control Management Program
• Maintaining Compliance through VMM Security Baselines and System Center Advisor

**Lab : Configuring Compliance in the Private Cloud**

• Creating an IT GRC Control Management Program
• Adding Test Results to a Manual Control Activity and View Compliance Reports
Assigning a Baseline

After completing this module, students will be able to:

- Describe the System Center 2012 Process Pack for IT GRC.
- Describe installing and configuring the Process Pack for IT GRC.
- Describe implementing an IT GRC Control Management Program.
- Describe maintaining compliance by using VMM Security Baselines and System Center Advisor.

**Module 50: Configuring SLAs, Dashboards, and Widgets** This module describes the various methods for surfacing service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

**Lessons**

- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
- System Center Analytics
- Using Excel and SSRS to View Data
- Overview of PerformancePoint

**Lab : Configuring SLAs, Dashboards, and Widgets**

- Configuring Service Level Tracking
- Configuring Service Level Management
- Configuring Microsoft Excel Analytics
- Configuring PerformancePoint Analytics

After completing this module, students will be able to:

- Describe Service Level Tracking in Microsoft System Center 2012 Operations Manager.
- Configure and deploy widgets and dashboards.
- Describe publishing in real time state with Microsoft Visio.
- Describe using System Center analytics.
- View data with Microsoft Office Excel and Microsoft SQL Server Reporting Services.
- Describe using Microsoft PerformancePoint.

**Module 51: Planning for the Private Cloud** This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

**Lessons**
• Understanding the Private Cloud
• Requirements for Deploying a Private Cloud
• Designing the Private Cloud Infrastructure
• Overview of System Center 2012 Components
• Deploying Hyper-V Clustering with VMM

Lab: Planning for the Private Cloud

• Deploying the Virtual Machine Manager Agent
• Creating a Hyper-V Host Cluster Using VMM

After completing this module, students will be able to:

• Describe the private cloud.
• Describe the requirements for deploying a private cloud.
• Design a private cloud infrastructure.
• Describe the System Center 2012 components.
• Deploy Hyper-V clustering with VMM.

Module 52: Configuring and Deploying the Private Cloud with System Center 2012 - Virtual Machine Manager
This module describes how to configure infrastructure components by using System Center 2012 - Virtual Machine Manager

Lessons

• Overview of VMM Architecture and Components
• Installing and Upgrading VMM
• Configuring VMM Security and Roles
• Understanding Host Groups

Lab: Configuring and Deploying the Private Cloud Infrastructure

• Reviewing and Configuring Hosts
• Configuring Host Groups
• Configuring User Roles and Run As Accounts
• Configuring the Library
• Preparing the Private Cloud Infrastructure
• Deploying a New Virtual Machine

After completing this module, students will be able to:

• Describe VMM architecture and components.
• Install and upgrade VMM.
• Configure VMM security and roles.
• Understand host groups.
Module 53: Extending and Maintaining the Private Cloud Infrastructure This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons

- Overview of the PXE and Update Server Roles
- Deploying Bare-Metal Hyper-V Host Servers
- Configuring the Update Server Role
- Creating and Using an Update Baseline

Lab: Maintaining the Private Cloud Infrastructure

- Configuring a PXE Server in VMM
- Configuring a Host Profile
- Configuring an Update Server Role in VMM
- Configuring a Software Update Baseline in VMM

After completing this module, students will be able to:

- Describe how VMM integrates with WDS and WSUS to provide PXE and Update server roles.
- Describe how to deploy bare-metal Hyper-V host servers.
- Describe how to maintain updates within the VMM infrastructure.
- Configure the Update server role.
- Create and use a software update compliance baseline.

Module 54: Configuring Application Delivery This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons

- Dynamic Application Deployment Overview
- Web Deployment Packages
- Server Application Virtualization Overview
- Configuring Server App-V Components
- Sequencing and Deploying Virtual Applications

Lab: Configuring Virtual Application Delivery

- Configuring the Server App-V Sequencer
- Configuring the Server App-V Agent
- Sequencing an Application
- Testing the Server App-V Package Deployment
After completing this module, students will be able to:

- Describe dynamic application deployment.
- Create web deployment packages by using the Web Deployment Tool.
- Describe server application virtualization.
- Configure the Server App-V agent and sequencer.
- Sequence and then test a Server App-V virtualized application.

**Module 55: Creating the Private Cloud Building Blocks**  This module explains how to prepare and deploy the underlying infrastructure components that are used as building blocks for delivering private cloud services.

**Lessons**

- Configuring Guest Operating System Profiles
- Configuring Hardware Profiles
- Configuring SQL Server Using SQL Server Profiles
- Configuring Application Profiles
- Configuring Virtual Machine Templates
- Configuring the Self-Service User Role

**Lab : Creating the Private Cloud Building Blocks**

- Configuring Profiles
- Configuring Virtual Machine Templates
- Configuring a Service Template
- Configuring a User Role
- Deploying the StockTrader Application Service

After completing this module, students will be able to:

- Configure guest operating system profiles.
- Configure hardware profiles.
- Deploy SQL Server using SQL Server profiles.
- Configure application profiles for a deployment.
- Configure virtual machine templates.
- Configure the self-service user role.

**Module 56: Deploying and Accessing a Private Cloud**  This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

**Lessons**

- Understanding Private Cloud Computing
- Installing and Configuring App Controller
- Creating and Managing Services and Service Templates
Lab : Deploying and Accessing a Private Cloud

- Creating and Configuring a Private Cloud
- Configuring App Controller
- Creating, Deploying and Managing Services

After completing this module, students will be able to:

- Describe private cloud computing.
- Install and configure App Controller.
- Create and manage services and service templates.

Module 57: Monitoring the Private Cloud Infrastructure This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons

- Operations Manager Architecture and Security
- Upgrading Operations Manager 2007 R2
- Configuring Notifications
- Configuring Management Packs
- Configuring Integration with System Center 2012

Lab : Monitoring the Private Cloud Infrastructure

- Deploying Agents
- Deploying and Configuring Monitoring Management Packs
- Configuring Notifications
- Configuring VMM Integration
- Configuring DPM Integration

After completing this module, students will be able to:

- Describe Operations Manager architecture and security considerations.
- Upgrade from Operations Manager 2007 R2 to System Center 2012 – Operations Manager.
- Describe the notification options available in Operations Manager.
- Install, configure, and upgrade management packs.
- Install and configure Operations Manager integration with VMM and DPM.

Module 58: Extending and Customizing Monitoring of the Private Cloud Infrastructure This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

Lessons

- Configuring the SharePoint Server Portal
• Monitoring Templates
• Distributed Application Monitoring

Lab : Extending and Customizing Monitoring

• Creating Custom Monitoring
• Creating a Distributed Application
• Configuring Service Level Management
• Creating Views for Private Cloud Infrastructure
• Configuring SharePoint Integration

After completing this module, students will be able to:

• Integrate Operations Manager data into a SharePoint portal.
• Describe how to use monitoring templates.
• Implement distributed application monitoring.

Module 59: Implementing Service Management for the Private Cloud This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

Lessons

• Service Manager Architecture Overview
• Upgrading to System Center 2012 - Service Manager
• Understanding Service Manager Work Items
• Configuring Service Manager Connectors
• Configuring Service Manager Notifications

Lab : Implementing Service Management for the Private Cloud

• Configuring Service Manager Basic Settings
• Configuring Service Manager Connectors
• Configuring the Self-Service Portal
• Configuring Notifications

After completing this module, students will be able to:

• Setup and configure the core components of Service Manager.
• Plan an upgrade from Service Manager 2010 R2 to System Center 2012 - Service Manager.
• Describe the various work items and their relationships with each other.
• Configure the Service Manager connectors.
• Configure notifications.

Module 60: Protecting the Private Cloud Infrastructure This module describes how to deploy and configure Data Protection Manager in a private cloud.
Lessons

- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

Lab: Protecting the Private Cloud Infrastructure

- Configuring the Storage Pool
- Deploying DPM Protection Agents
- Creating and Configuring Protection Groups
- Configuring SQL Server Self-Service Recovery
- Restoring Data from a SQL Server Protection Group
- Performing Self-Service Recovery to Recover SQL Server Data

After completing this module, students will be able to:

- Describe Data Protection Manager architecture and security considerations.
- Plan an upgrade from Data Protection Manager 2010 R2 to System Center 2012 - Data Protection Manager.
- Configure the components required to provide protection for the private cloud infrastructure.
- Configure protection of key applications within the private cloud infrastructure.
- Restore key applications within the private cloud infrastructure.

Module 61: Automating and Standardizing the Private Cloud

This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

Lessons

- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
- Managing Runbooks
- Configuring Integration Packs

Lab: Automating the Private Cloud

- Creating a Runbook Server and Configuring Integration Packs
- Configuring a Template to Deploy Agents on a New Virtual Machine
- Creating a Runbook to Protect All Resources on a Virtual Machine

After completing this module, students will be able to:
• Describe key components of System Center Orchestrator.
• Describe how to deploy and configure key Orchestrator components in a private cloud.
• Configure the System Center integration packs in Orchestrator.
• Create Runbooks.
• Configure Service Manager to execute Runbooks.

Module 62: Configuring the Cloud Services Process Pack This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons

• Implementing the Cloud Services Process Pack
• Service Level Management

Lab: Configuring the Cloud Service Process Pack

• Installing the Cloud Service Process Pack
• Configuring User Roles and Settings
• Configuring Service Offerings
• Creating an Incident Request
• Configuring Service Level Management

After completing this module, students will be able to:

• Describe the service catalog and how to implement it in Service Manager.
• Implement a Cloud Services Process Pack.
• Configure service request fulfillment.
• Configure service offerings.
• Use service level management.
MCSE Private Cloud Boot Camp

About this Course

This course describes how to monitor and operate a private cloud with Microsoft System Center 2012. This course focuses on how to manage and administer the private cloud, and it describes how you can monitor key infrastructure elements and applications that run within the private cloud. This course describes private cloud configuration and deployment with Microsoft System Center 2012.

MCSE Candidate Profile

Data center administrators responsible for designing, installing and configuring a private cloud infrastructure. This boot camp is intended for students seeking to earn the MCSE Private Cloud 2012 certification and who need an expert instructor to guide them throughout the training and exam preparation process.

MCSE Private Cloud

The primary goal of this program is to help each student pass the exams required to earn the MCSE Private Cloud 2012 certification. To do this, your knowledgeable instructor will blend lecture and practice exams to prepare you to pass each exam.

Course Outline

Module 1: Introduction to the Private Cloud. This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012.

Lessons

- Overview of the Cloud Computing Model
- Requirements for the Private Cloud
- Operating a Private Cloud Infrastructure with System Center
- Maintaining the Health of the Private Cloud
- Integrating System Center Components
- Verifying the Compliance of the Private Cloud Infrastructure
Module 2: Configuring and Optimizing Business Unit Clouds. This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons
- Overview of System Center Virtual Machine Manager
- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Module 3: Deploying Cloud Services. This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons
- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
- Data-Tier Application Packages

Module 4: Monitoring Private Cloud Services. This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

Lessons
- Overview of System Center Operations Manager
- Agent Deployment in Operations Manager
- Configuring Custom Monitoring
- Monitoring the Network Infrastructure
- Monitoring Distributed Applications

Module 5: Configuring Application Performance Monitoring. This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.
Lessons

- Application Performance Monitoring
- Advanced Monitoring in Application Performance Monitoring
- Viewing Application Performance in Operations Manager

Module 6: Operating and Extending Service Management in the Private Cloud

This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

Lessons

- Overview of Service Manager
- Configuring Security and User Roles
- Configuring Work Items
- Configuring Incident Queues
- Configuring Service Offerings

Module 7: Automatic Incident Creation, Remediation, and Change Requests. This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

Lessons

- Overview of System Center Orchestrator 2012
- Integrating Orchestrator with Operations Manager and Service Manager

Module 8: Problem Management in the Private Cloud. This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in Operations Manager and then use it to identify and route incidents and problems to Service Manager.

Lessons

- Overview of Problem Management
- Creating Custom Rules

Module 9: Automating Self-Service Provisioning
This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

**Lessons**
- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

**Module 10: Private Cloud Protection and Recovery.** This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database.

**Lessons**
- Protecting Data in the Private Cloud
- Recovering Data in the Private Cloud

**Module 11: Configuring Compliance in the Private Cloud.** This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

**Lessons**
- Overview of the Process Pack for IT GRC
- Installing and Configuring the Process Pack for IT GRC
- Implementing an IT GRC Control Management Program
- Maintaining Compliance through VMM Security Baselines and System Center Advisor

**Module 12: Configuring SLAs, Dashboards, and Widgets.** This module describes the various methods for surfacing service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

**Lessons**
- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
• System Center Analytics
• Using Excel and SSRS to View Data
• Overview of PerformancePoint

Module 13: Planning for the Private Cloud. This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

Lessons
• Understanding the Private Cloud
• Requirements for Deploying a Private Cloud
• Designing the Private Cloud Infrastructure
• Overview of System Center 2012 Components
• Deploying Hyper-V Clustering with VMM

Module 14: Configuring and Deploying the Private Cloud with System Center 2012 -Virtual Machine Manager.
This module describes how to configure infrastructure components by using System Center 2012 -Virtual Machine Manager

Lessons
• Overview of VMM Architecture and Components
• Installing and Upgrading VMM
• Configuring VMM Security and Roles
• Understanding Host Groups

Module 15: Extending and Maintaining the Private Cloud Infrastructure. This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons
• Overview of the PXE and Update Server Roles
• Deploying Bare-Metal Hyper-V Host Servers
• Configuring the Update Server Role
• Creating and Using an Update Baseline

Module 16: Configuring Application Delivery. This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons
• Dynamic Application Deployment Overview
• Web Deployment Packages
• Server Application Virtualization Overview
• Configuring Server App-V Components
• Sequencing and Deploying Virtual Applications

Module 17: Creating the Private Cloud Building Blocks. This module explains how to prepare and deploy the underlying infrastructure components that are used as building blocks for delivering private cloud services.

Lessons
• Configuring Guest Operating System Profiles
• Configuring Hardware Profiles
• Configuring SQL Server Using SQL Server Profiles
• Configuring Application Profiles
• Configuring Virtual Machine Templates
• Configuring the Self-Service User Role

Module 18: Deploying and Accessing a Private Cloud. This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

Lessons
• Understanding Private Cloud Computing
• Installing and Configuring App Controller
• Creating and Managing Services and Service Templates

Module 19: Monitoring the Private Cloud Infrastructure. This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons
• Operations Manager Architecture and Security
• Upgrading Operations Manager 2007 R2
• Configuring Notifications
• Configuring Management Packs
• Configuring Integration with System Center 2012

Module 20: Extending and Customizing Monitoring of the Private Cloud Infrastructure.
This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

**Lessons**
- Configuring the SharePoint Server Portal
- Monitoring Templates
- Distributed Application Monitoring

**Module 21: Implementing Service Management for the Private Cloud.** This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

**Lessons**
- Service Manager Architecture Overview
- Upgrading to System Center 2012 - Service Manager
- Understanding Service Manager Work Items
- Configuring Service Manager Connectors
- Configuring Service Manager Notifications

**Module 22: Protecting the Private Cloud Infrastructure.** This module describes how to deploy and configure Data Protection Manager in a private cloud.

**Lessons**
- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

**Module 23: Automating and Standardizing the Private Cloud.** This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

**Lessons**
- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
• Managing Runbooks
• Configuring Integration Packs

Module 24: Configuring the Cloud Services Process Pack. This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons
• Implementing the Cloud Services Process Pack
• Service Level Management
• Use service level management.
The Microsoft Certified Solutions Expert (MCSE): Windows Server 2012 certification shows that you have the primary set of Windows Server 2012 skills, relevant across multiple solution areas in a business environment, to reduce IT costs and deliver more business value. Earning an MCSE: Private Cloud certification will qualify you for such jobs as server administrator, systems programmer, and network manager.

This course is intended for Information Technology (IT) Professionals with hands on experience working in a Windows server 2008 or Windows Server 2012 environment who wish to acquire the skills and knowledge necessary to be able to manage and maintain the core infrastructure required for a Windows Server 2012 and Windows Server 2012 R2 environment.

The primary goal of this program is to help each student pass the exams required to earn the MCSE Windows Private Cloud. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

**Module 19: Managing User Desktops with Group Policy.** This module explains how to configure Administrative Templates.

Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

**Module 20: Configuring and Troubleshooting Remote Access.** This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

**Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role.** This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

**Module 22: Implementing Network Access Protection.** This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

**Module 23: Optimizing File Services.** This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

• Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Introduction to the Private Cloud This module gives students an overview of a private cloud infrastructure, including what it is, the business and technical drivers behind implementing it, and how they can use System Center 2012 to monitor and operate it. Students will understand the key concepts of a private cloud and verify key components of System Center 2012. Lessons

- Overview of the Cloud Computing Model
- Requirements for the Private Cloud
- Operating a Private Cloud Infrastructure with System Center
- Maintaining the Health of the Private Cloud
- Integrating System Center Components
- Verifying the Compliance of the Private Cloud Infrastructure

Lab: Verifying the Private Cloud Infrastructure

- Verifying the Infrastructure
- Verifying System Center Components
Lab: Verifying the Compliance of the Private Cloud Infrastructure

- Exercise: Checking Compliance

After completing this module, students will be able to:

- Describe the features of a cloud computing model.
- Describe the requirements for the private cloud.
- Describe how you can use System Center to monitor and manage the private cloud.
- Describe how to maintain the health of the private cloud infrastructure.
- Describe how to integrate System Center components.
- Verify the compliance of the private cloud infrastructure.

Module 40: Configuring and Optimizing Business Unit Clouds

This module explains how to configure a new business unit cloud within Virtual Machine Manager.

Lessons: Overview of System Center Virtual Machine Manager

- Managing a Virtual Environment with Virtual Machine Manager
- Creating Business Unit Clouds

Lab: Configuring and Optimizing Business Unit Clouds

- Configuring Network Resources
- Creating the Business Unit Cloud
- Configuring Security

After completing this module, students will be able to:

- Describe the core components, key features, architecture, and security features of Virtual Machine Manager, and the role it plays in the private cloud.
- Use Virtual Machine Manager to manage private cloud infrastructure.
- Describe how to build and configure resources and security for a business unit cloud.

Module 41: Deploying Cloud Services

This module explains how to deploy pre-packaged applications and create a new service template to deploy a service into the cloud.

Lessons

- Overview of Service Templates
- VMM Profiles
- Web Deploy Packages
- Overview of Server App-V
• Data-Tier Application Packages

**Lab: Importing and Deploying the Stock Trader Application**

• Deploying a Single Tier Service  
• Configuring Prerequisites  
• Preparing the Stock Trader Service Template  
• Deploying the Service Template

After completing this module, students will be able to:

• Create service templates in VMM by using the Service Template Designer.  
• Describe the process of creating VMM profiles.  
• Describe the process of creating Web Deploy packages.  
• Describe the process of sequencing by using Server App-V.  
• Describe the process of creating data-tier application packages.

**Module 42: Monitoring Private Cloud Services** This module provides an overview of System Center Operations Manager. The students are shown how Operations Manager is used to monitor the various services that underpin the private cloud. The students are then shown how to deploy agents to key service components running within the private cloud. Custom monitoring is then applied to these components which include the creation of a distributed application model to give a holistic view of the health of the private cloud infrastructure.

**Lessons**

• Overview of System Center Operations Manager  
• Agent Deployment in Operations Manager  
• Configuring Custom Monitoring  
• Monitoring the Network Infrastructure  
• Monitoring Distributed Applications

**Lab: Monitoring Private Cloud Services**

• Deploying an Agent  
• Configuring Custom Monitoring  
• Creating a Distributed Application Model  
• Detecting and Recovering from a Failure

After completing this module, students will be able to:

• Describe the key features of Operations Manager.  
• Describe the architecture of Operations Manager, including databases, management servers, management server pools, consoles, gateways, and reporting.
• Describe how to secure access to Operations Manager by using User Roles.

Module 43: Configuring Application Performance Monitoring This module gives students a deep insight into the Application Performance Monitoring (APM) feature of Operations Manager. A .NET application has been installed into the lab environment that will be used for this module. Students will learn to configure APM to monitor the performance and availability of this application. A break in the application is then instigated where students will see how Operations Manager detects and reports this with the Alerting and Diagnostics tools that are built into Operations Manager.

Lessons

• Application Performance Monitoring
• Advanced Monitoring in Application Performance Monitoring
• Viewing Application Performance in Operations Manager

Lab: Configuring Application Performance Monitoring

• Configuring Basic Monitoring in Application Performance Monitoring
• Customizing the Performance Thresholds
• Validating Monitoring
• Creating a Distributed Application Model for the Dinner Now Application

After completing this module, students will be able to:

• Describe the core components in APM and the best practices when implementing them.
• Describe how to implement advanced monitoring features that are available in APM.
• Describe how to view application performance in Operations Manager.

Module 44: Operating and Extending Service Management in the Private Cloud

This module explains the core functionality of Service Manager and the steps to create and manage change requests, incidents, and release records. The module also describes about the security model behind Service Manager so that students can customize and extend the integral functionality of the service.

Lessons

• Overview of Service Manager
• Configuring Security and User Roles
• Configuring Work Items
• Configuring Incident Queues
• Configuring Service Offerings

Lab: Operating and Extending Service Management in the Cloud

• Configuring Security Roles
• Configuring Notifications
• Publishing an Incident Service Offering
• Raising an Incident
• Creating an Approving a Change Request
• Creating an Assigning a Release Record

After completing this module, students will be able to:

• Describe Service Manager.
• Describe configuring security and user roles.
• Describe configuring work items.
• Describe configuring incident queues.
• Describe configuring service offerings.

Module 45: Automatic Incident Creation, Remediation, and Change Requests This module provides an overview of Orchestrator and explains how Orchestrator integrates with Operations Manager and Service Manager.

Lessons

• Overview of System Center Orchestrator 2012
• Integrating Orchestrator with Operations Manager and Service Manager

Lab: Automating Incident Creation, Remediation, and Change Requests

• Configuring the Incident Template
• Configuring Incidents That Affect the StockTrader Service
• Automating Incident Remediation and Change Requests

After completing this module, students will be able to:

• Describe the Orchestrator components and the available Integration Packs.
• Integrate Orchestrator with Operations Manager and Service Manager.

Module 46: Problem Management in the Private Cloud  This module provides an overview of problem management and explains how students can use it within a service management framework. Additionally, this module explains its implementation as a manual feature of Service Manager. Finally, this module describes how to create a custom event monitor in
Operations Manager and then use it to identify and route incidents and problems to Service Manager.

**Lessons**

- Overview of Problem Management
- Creating Custom Rules

**Lab : Automating Problem Management in the Private Cloud**

- Manually Creating a Problem Record
- Creating a Custom Event Rule in Operations Manager
- Configuring Automated Problem Record Creation

After completing this module, students will be able to:

- Describe problem management.
- Create custom rules.

**Module 47: Automating Self-Service Provisioning**

This module explains about automating self-service provisioning by using the System Center Cloud Service Process Pack, including the configuration items that are created and the request items that are contained in the System Center Cloud Service Process Pack.

**Lessons**

- Installing and Configuring the System Center Cloud Services Process Pack
- Cloud Services Configuration Items
- Cloud Services Request Items

**Lab : Automating Self-Service Provisioning**

- Completing the Prerequisites for the System Center Cloud Services Process Pack
- Installing the System Center Cloud Services Process Pack
- Configuring the System Center Cloud Services Process Pack
- Deploying a Virtual Machine for StockTrader by using the Cloud Services Process Pack

After completing this module, students will be able to:

- Describe how to install and configure the System Center Cloud Services Process Pack.
- Describe the various Cloud Services configuration items that make up the System Center Cloud Service Process Pack.
• Describe the various Cloud Services request items that are included in the System Center Cloud Services Process Pack.

**Module 48: Private Cloud Protection and Recovery** This module explains how to protect the resources in the private cloud by using Data Protection Manager. It also explains how to implement a recovery action by using Orchestrator to recover a database.

**Lessons**

• Protecting Data in the Private Cloud
• Recovering Data in the Private Cloud

**Lab : Private Cloud Protection and Recovery**

• Configuring Manual Protection and Recovery of Key Service Data
• Configuring Automatic Protection and Recovery of Key Service Data
• Monitoring Protection Status

After completing this module, students will be able to:

• Configure data protection in the private cloud.
• Configure data recovery in the private cloud.

**Module 49: Configuring Compliance in the Private Cloud** This module explains how to implement IT Governance, Risk Management, and Compliance (GRC) in a private cloud environment by using System Center 2012. It also explains how to implement Software Update Compliance in Virtual Machine Manager to verify whether key private cloud infrastructure is correctly updated with the latest software updates. The module also describes how to implement the IT GRC Management Pack in Service Manager to check for compliance across key Service Components and remediate non-compliant items.

**Lessons**

• Overview of the Process Pack for IT GRC
• Installing and Configuring the Process Pack for IT GRC
• Implementing an IT GRC Control Management Program
• Maintaining Compliance through VMM Security Baselines and System Center Advisor

**Lab : Configuring Compliance in the Private Cloud**

• Creating an IT GRC Control Management Program
• Adding Test Results to a Manual Control Activity and View Compliance Reports
Assigning a Baseline

After completing this module, students will be able to:

- Describe the System Center 2012 Process Pack for IT GRC.
- Describe installing and configuring the Process Pack for IT GRC.
- Describe implementing an IT GRC Control Management Program.
- Describe maintaining compliance by using VMM Security Baselines and System Center Advisor.

Module 50: Configuring SLAs, Dashboards, and Widgets

This module describes the various methods for surfacing service and performance-related data from Operations Manager and Service Manager to SharePoint and Microsoft Excel.

Lessons

- Service Level Tracking
- Configuring and Deploying Widgets and Dashboards
- Publishing Real-Time State with Microsoft Visio Snap-in
- System Center Analytics
- Using Excel and SSRS to View Data
- Overview of PerformancePoint

Lab: Configuring SLAs, Dashboards, and Widgets

- Configuring Service Level Tracking
- Configuring Service Level Management
- Configuring Microsoft Excel Analytics
- Configuring PerformancePoint Analytics

After completing this module, students will be able to:

- Describe Service Level Tracking in Microsoft System Center 2012 Operations Manager.
- Configure and deploy widgets and dashboards.
- Describe publishing in real time state with Microsoft Visio.
- Describe using System Center analytics.
- View data with Microsoft Office Excel and Microsoft SQL Server Reporting Services.
- Describe using Microsoft PerformancePoint.

Module 51: Planning for the Private Cloud

This module describes the core components of a private cloud and the prerequisites for deploying a private cloud.

Lessons
• Understanding the Private Cloud
• Requirements for Deploying a Private Cloud
• Designing the Private Cloud Infrastructure
• Overview of System Center 2012 Components
• Deploying Hyper-V Clustering with VMM

Lab: Planning for the Private Cloud

• Deploying the Virtual Machine Manager Agent
• Creating a Hyper-V Host Cluster Using VMM

After completing this module, students will be able to:

• Describe the private cloud.
• Describe the requirements for deploying a private cloud.
• Design a private cloud infrastructure.
• Describe the System Center 2012 components.
• Deploy Hyper-V clustering with VMM.

Module 52: Configuring and Deploying the Private Cloud with System Center 2012 - Virtual Machine Manager

This module describes how to configure infrastructure components by using System Center 2012 - Virtual Machine Manager

Lessons

• Overview of VMM Architecture and Components
• Installing and Upgrading VMM
• Configuring VMM Security and Roles
• Understanding Host Groups

Lab: Configuring and Deploying the Private Cloud Infrastructure

• Reviewing and Configuring Hosts
• Configuring Host Groups
• Configuring User Roles and Run As Accounts
• Configuring the Library
• Preparing the Private Cloud Infrastructure
• Deploying a New Virtual Machine

After completing this module, students will be able to:

• Describe VMM architecture and components.
• Install and upgrade VMM.
• Configure VMM security and roles.
• Understand host groups.
Module 53: Extending and Maintaining the Private Cloud Infrastructure This module describes how to integrate features provided by Windows Deployment Services (WDS) and Windows Server Update Services (WSUS) to help extend and manage the VMM private cloud infrastructure resources.

Lessons

- Overview of the PXE and Update Server Roles
- Deploying Bare-Metal Hyper-V Host Servers
- Configuring the Update Server Role
- Creating and Using an Update Baseline

Lab: Maintaining the Private Cloud Infrastructure

- Configuring a PXE Server in VMM
- Configuring a Host Profile
- Configuring an Update Server Role in VMM
- Configuring a Software Update Baseline in VMM

After completing this module, students will be able to:

- Describe how VMM integrates with WDS and WSUS to provide PXE and Update server roles.
- Describe how to deploy bare-metal Hyper-V host servers.
- Describe how to maintain updates within the VMM infrastructure.
- Configure the Update server role.
- Create and use a software update compliance baseline.

Module 54: Configuring Application Delivery This module explains how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in the private cloud.

Lessons

- Dynamic Application Deployment Overview
- Web Deployment Packages
- Server Application Virtualization Overview
- Configuring Server App-V Components
- Sequencing and Deploying Virtual Applications

Lab: Configuring Virtual Application Delivery

- Configuring the Server App-V Sequencer
- Configuring the Server App-V Agent
- Sequencing an Application
- Testing the Server App-V Package Deployment
After completing this module, students will be able to:

- Describe dynamic application deployment.
- Create web deployment packages by using the Web Deployment Tool.
- Describe server application virtualization.
- Configure the Server App-V agent and sequencer.
- Sequence and then test a Server App-V virtualized application.

**Module 55: Creating the Private Cloud Building Blocks** This module explains how to prepare and deploy the underlying infrastructure components that are used as building blocks for delivering private cloud services.

**Lessons**

- Configuring Guest Operating System Profiles
- Configuring Hardware Profiles
- Configuring SQL Server Using SQL Server Profiles
- Configuring Application Profiles
- Configuring Virtual Machine Templates
- Configuring the Self-Service User Role

**Lab : Creating the Private Cloud Building Blocks**

- Configuring Profiles
- Configuring Virtual Machine Templates
- Configuring a Service Template
- Configuring a User Role
- Deploying the StockTrader Application Service

After completing this module, students will be able to:

- Configure guest operating system profiles.
- Configure hardware profiles.
- Deploy SQL Server using SQL Server profiles.
- Configure application profiles for a deployment.
- Configure virtual machine templates.
- Configure the self-service user role.

**Module 56: Deploying and Accessing a Private Cloud** This module explains private clouds, System Center 2012 - App Controller, and private cloud services.

**Lessons**

- Understanding Private Cloud Computing
- Installing and Configuring App Controller
- Creating and Managing Services and Service Templates
Lab: Deploying and Accessing a Private Cloud

- Creating and Configuring a Private Cloud
- Configuring App Controller
- Creating, Deploying and Managing Services

After completing this module, students will be able to:

- Describe private cloud computing.
- Install and configure App Controller.
- Create and manage services and service templates.

Module 57: Monitoring the Private Cloud Infrastructure This module explains how to monitor the private cloud infrastructure by using System Center 2012 - Operations Manager.

Lessons

- Operations Manager Architecture and Security
- Upgrading Operations Manager 2007 R2
- Configuring Notifications
- Configuring Management Packs
- Configuring Integration with System Center 2012

Lab: Monitoring the Private Cloud Infrastructure

- Deploying Agents
- Deploying and Configuring Monitoring Management Packs
- Configuring Notifications
- Configuring VMM Integration
- Configuring DPM Integration

After completing this module, students will be able to:

- Describe Operations Manager architecture and security considerations.
- Upgrade from Operations Manager 2007 R2 to System Center 2012 – Operations Manager.
- Describe the notification options available in Operations Manager.
- Install, configure, and upgrade management packs.
- Install and configure Operations Manager integration with VMM and DPM.

Module 58: Extending and Customizing Monitoring of the Private Cloud Infrastructure This module explains how to use Operations Manager templates to monitor various applications and implement distributed application monitoring.

Lessons

- Configuring the SharePoint Server Portal
• Monitoring Templates
• Distributed Application Monitoring

Lab : Extending and Customizing Monitoring

• Creating Custom Monitoring
• Creating a Distributed Application
• Configuring Service Level Management
• Creating Views for Private Cloud Infrastructure
• Configuring SharePoint Integration

After completing this module, students will be able to:

• Integrate Operations Manager data into a SharePoint portal.
• Describe how to use monitoring templates.
• Implement distributed application monitoring.

Module 59: Implementing Service Management for the Private Cloud
This module explains how to setup, configure, and integrate the core components of System Center 2012 - Service Manager into the private cloud infrastructure.

Lessons

• Service Manager Architecture Overview
• Upgrading to System Center 2012 - Service Manager
• Understanding Service Manager Work Items
• Configuring Service Manager Connectors
• Configuring Service Manager Notifications

Lab : Implementing Service Management for the Private Cloud

• Configuring Service Manager Basic Settings
• Configuring Service Manager Connectors
• Configuring the Self-Service Portal
• Configuring Notifications

After completing this module, students will be able to:

• Setup and configure the core components of Service Manager.
• Plan an upgrade from Service Manager 2010 R2 to System Center 2012 - Service Manager.
• Describe the various work items and their relationships with each other.
• Configure the Service Manager connectors.
• Configure notifications.

Module 60: Protecting the Private Cloud Infrastructure
This module describes how to deploy and configure Data Protection Manager in a private cloud.
Lessons

- Planning DPM Deployment
- DPM Architecture and Components
- Upgrading DPM
- Configuring DPM for the Private Cloud
- Configuring Application Protection for the Private Cloud
- Restoring Applications to the Private Cloud

Lab: Protecting the Private Cloud Infrastructure

- Configuring the Storage Pool
- Deploying DPM Protection Agents
- Creating and Configuring Protection Groups
- Configuring SQL Server Self-Service Recovery
- Restoring Data from a SQL Server Protection Group
- Performing Self-Service Recovery to Recover SQL Server Data

After completing this module, students will be able to:

- Describe Data Protection Manager architecture and security considerations.
- Plan an upgrade from Data Protection Manager 2010 R2 to System Center 2012 - Data Protection Manager.
- Configure the components required to provide protection for the private cloud infrastructure.
- Configure protection of key applications within the private cloud infrastructure.
- Restore key applications within the private cloud infrastructure.

Module 61: Automating and Standardizing the Private Cloud This module explains how to deploy and configure System Center Orchestrator in a private cloud and integrate it with other System Center 2012 components.

Lessons

- Orchestrator Architecture and Components Overview
- Deploying and Configuring Core Components
- Managing Runbooks
- Configuring Integration Packs

Lab: Automating the Private Cloud

- Creating a Runbook Server and Configuring Integration Packs
- Configuring a Template to Deploy Agents on a New Virtual Machine
- Creating a Runbook to Protect All Resources on a Virtual Machine

After completing this module, students will be able to:
• Describe key components of System Center Orchestrator.
• Describe how to deploy and configure key Orchestrator components in a private cloud.
• Configure the System Center integration packs in Orchestrator.
• Create Runbooks.
• Configure Service Manager to execute Runbooks.

Module 62: Configuring the Cloud Services Process Pack This module describes how to implement the Cloud Services Process Pack and use service level management.

Lessons

• Implementing the Cloud Services Process Pack
• Service Level Management

Lab : Configuring the Cloud Service Process Pack

• Installing the Cloud Service Process Pack
• Configuring User Roles and Settings
• Configuring Service Offerings
• Creating an Incident Request
• Configuring Service Level Management

After completing this module, students will be able to:

• Describe the service catalog and how to implement it in Service Manager.
• Implement a Cloud Services Process Pack.
• Configure service request fulfillment.
• Configure service offerings.
• Use service level management.
The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

• Overview of AD DS
• Overview of Domain Controllers
• Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

• Managing User Accounts
• Managing Group Accounts
• Managing Computer Accounts
• Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

• Using Command-line Tools for AD DS Administration
• Using Windows PowerShell for AD DS Administration
• Performing Bulk Operations with Windows PowerShell


Lessons

• Overview of TCP/IP
• Understanding IPv4 Addressing
• Subnetting and Supernetting
• Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
• Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

• Implementing Administrative Templates
• Configuring Folder Redirection and Scripts
• Configuring Group Policy Preferences
• Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

• Configuring Network Access
• Configuring Virtual Private Network (VPN) Access
• Overview of Network Policies
• Troubleshooting Routing and Remote Access
• Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

• Installing and Configuring a NPS
• Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
• NPS Authentication Methods
• Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

• Overview of Network Access Protection
• Overview of NAP Enforcement Processes
• Configuring NAP
• Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
• Deploying CAs
• Deploying and Configuring CA Hierarchy
• Deploying and Managing Certificate Templates
• Implementing Certificate Distribution and Revocation
• Managing Certificate Recovery

**Module 33: Implementing Active Directory Rights Management Services.** This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

**Lessons**

• AD RMS Overview
• Deploying and Managing an AD RMS Infrastructure
• Configuring AD RMS Content Protection
• Configuring External Access to AD RMS

**Module 34: Implementing Active Directory Federation Services.** This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

**Lessons**

• Overview of AD FS
• Deploying AD FS
• Implementing AD FS for a Single Organization
• Deploying AD FS in a B2B Federation Scenario

**Module 35: Implementing Network Load Balancing.** This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

**Lessons**

• Overview of NLB
• Configuring an NLB Cluster
• Planning an NLB Implementation

**Module 36: Implementing Failover Clustering.** This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

**Lessons**

• Overview of Failover Clustering
• Implementing a Failover Cluster
• Configuring Highly Available Applications and Services on a Failover Cluster
• Maintaining a Failover Cluster
• Implementing a Multi-Site Failover Cluster

Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

• Overview of Integrating Hyper-V with Failover Clustering
• Implementing Hyper-V Virtual Machines on Failover Clusters
• Implementing Hyper-V Virtual Machine Movement
• Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

• Overview of Disaster Recovery
• Implementing Windows Server Backup
• Implementing Server and Data Recovery

Module 39: Planning a Server Upgrade and Migration. This module explains how to plan a server upgrade and migration strategy.

Lessons

• Upgrade and Migration Considerations
• Creating a Server Upgrade and Migration Plan
• Planning for Virtualization

Module 40: Planning and Implementing a Server Deployment Infrastructure. This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

• Selecting an Appropriate Server Imaging Strategy
• Selecting a Deployment Automation Strategy
• Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

Module 46: Designing and Implementing an Active Directory Domain Services Topology. This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

Module 47: Planning and Implementing Storage. This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

Module 48: Planning and Implementing File Services. This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

Module 49: Designing and Implementing Network Access Services. This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
Module 55: Planning and Implementing a Virtualization Administration Solution. This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

Lessons

- Planning and Implementing Automation with System Center 2012
- Planning and Implementing System Center 2012 Administration
- Planning and Implementing Self-Service Options in System Center 2012

Module 56: Planning and Implementing a Server Monitoring Strategy. This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

Lessons

- Planning Monitoring in Windows Server 2012
- Overview of System Center Operations Manager
- Planning and Configuring Management Packs
- Planning and Configuration Notifications and Reporting
- Configuring Integration with VMM

Module 57: Planning and Implementing High Availability for File Services and Applications. This module explains how to plan and implement high availability for file services and applications.

Lessons

- Planning and Implementing Storage Spaces
- Planning and Implementing Distributed File System (DFS)
- Planning and Implementing Network Load Balancing (NLB)

Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering. This module explains how to plan and implement failover clustering.

Lessons

- Planning an Infrastructure for Failover Clustering
- Implementing Failover Clustering
- Integrating Failover Clustering with Server Virtualization
Planning a Multisite Failover Cluster

Module 59: Planning and Implementing Server Update Infrastructure. This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

Lessons

- Planning and Implementing a WSUS Deployment
- Planning Software Updates with System Center 2012 Configuration Manager
- Planning and Implementing Updates in a Server Virtualization Infrastructure
- Planning and Implementing Virtual Machine Backup and Recovery

Module 60: Planning and Implementing a Business Continuity Strategy. This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

Lessons

- Overview of Business Continuity Planning
- Planning and Implementing Backup Strategies
- Planning and Implementing Recovery
- Planning and Implementing Backup and Recovery of Virtual Machines

Module 61: Planning and Implementing an Public Key Infrastructure. This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

Lessons

- Planning and Implementing Deployment of a Certification Authority
- Planning and Implementing Certificate Templates
- Planning and Implementing Certificate Distribution and Revocation
- Planning and Implementing Key Archival and Recovery

Module 62: Planning and Implementing an Identity Federation Infrastructure. This module describes how to plan and implement an identity federation infrastructure.

Lessons

- Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
- Planning and Implementing AD FS Claims Providers and Relying Parties
- Planning and Implementing AD FS Claims and Claim Rules

Module 63: Planning and Implementing an Information Rights Management Infrastructure. This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
MCSE Server Infrastructure Boot Camp Overview

Day One:
Course 20410C: Installing and Configuring Windows Server 2012
Module 1: Deploying and Managing Windows Server 2012
Module 2: Introduction to Active Directory Domain Services
Module 3: Managing Active Directory Domain Services Objects
Module 4: Automating Active Directory Domain Services Administration
Module 5: Implementing IPv4
Module 6: Implementing Dynamic Host Configuration Protocol
Module 7: Implementing DNS

Day Two:
Module 8: Implementing IPv6
Module 9: Implementing Local Storage
Module 10: Implementing File and Print Services
Module 11: Implementing Group Policy
Module 12: Securing Windows Servers Using Group Policy Objects
Module 13: Implementing Server Virtualization with Hyper-V

Day Three:
Review
Study Material
Exam 70-410

Day Four:
Course 20411C: Administering Windows Server 2012
Module 1: Configuring and Troubleshooting Domain Name System
Module 2: Maintaining Active Directory Domain Services
Module 3: Managing User and Service Accounts
Module 4: Implementing a Group Policy Infrastructure
Module 5: Managing User Desktops with Group Policy
Module 6: Configuring and Troubleshooting Remote Access
Module 7: Installing, Configuring, and Troubleshooting the Network Policy Server Role

**Day Five:**
Module 8: Implementing Network Access Protection
Module 9: Optimizing File Services
Module 10: Configuring Encryption and Advanced Auditing
Module 11: Deploying and Maintaining Server Images
Module 12: Implementing Update Management
Module 13: Monitoring Windows Server 2012

**Day Six:**
Review
Study Material
Exam 70-411

**Day Seven:**

Course 20412C: Configuring Advanced Windows Server 2012 Services
Module 1: Implementing Advanced Network Services
Module 2: Implementing Advanced File Services
Module 3: Implementing Dynamic Access Control
Module 4: Implementing Distributed AD DS Deployments
Module 5: Implementing AD DS Sites and Replication
Module 6: Implementing Active Directory Certificate Services

**Day Eight:**
Module 7: Implementing Active Directory Rights Management Services

Module 8: Implementing Active Directory Federation Services

Module 9: Implementing Network Load Balancing

Module 10: Implementing Failover Clustering

Module 11: Implementing Failover Clustering with Hyper-V

Module 12: Implementing Disaster Recovery

**Day Nine:**

Review

Study Material

Exam 70-412

**Day Ten:**

**Course 20413B: Designing and Implementing a Server Infrastructure**

Module 1: Planning a Server Upgrade and Migration

Module 2: Planning and Implementing a Server Deployment Infrastructure

Module 3: Designing and Maintaining an IP Configuration and Address Management Solution

Module 4: Designing and Implementing Name Resolution

Module 5: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure

Module 6: Designing and Implementing an Active Directory Organizational Unit Infrastructure

Module 7: Designing and Implementing a Group Policy Object Strategy

Module 8: Designing and Implementing an Active Directory Domain Services Topology

**Day Eleven:**

Module 9: Planning and Implementing Storage

Module 10: Planning and Implementing File Services

Module 11: Designing and Implementing Network Access Services

Module 12: Designing and Implementing Network Protection
Review

Study Material

Test 70-413 (if students feel prepared, if not defer to next day)

**Day Twelve:**

Quick Study/Test 70-413 (if applicable)

**Course 20414B: Implementing an Advanced Server Infrastructure**

Module 1: Overview of Management in an Enterprise Data Center

Module 2: Planning and Implementing a Server Virtualization Strategy

Module 3: Planning and Implementing Networks and Storage for Virtualization

Module 4: Planning and Deploying Virtual Machines

Module 5: Planning and Implementing a Virtualization Administration Solution

Module 6: Planning and Implementing a Server Monitoring Strategy

**Day Thirteen:**

Module 7: Planning and Implementing High Availability for File Services and Applications

Module 8: Planning and Implementing a High Availability Infrastructure Using Failover Clustering

Module 9: Planning and Implementing Server Update Infrastructure

Module 10: Planning and Implementing a Business Continuity Strategy

Module 11: Planning and Implementing an Public Key Infrastructure

Module 12: Planning and Implementing an Identity Federation Infrastructure

Module 13: Planning and Implementing an Information Rights Management Infrastructure

**Day Fourteen:**

Course Evaluation

Review

Study Material

Test 70-414
The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

About this Course

The Microsoft Certified Solutions Expert (MCSE) certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

MCSE Candidate Profile

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

**Module 11: Implementing Group Policy.** This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

**Module 13: Implementing Server Virtualization with Hyper-V.** This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

**Module 14: Deploying and Maintaining Server Images.** This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

- PKI Overview
Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

- Overview of Failover Clustering
Module 37: Implementing Failover Clustering with Hyper-V. This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

Module 38: Implementing Disaster Recovery. This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

Module 39: Planning a Server Upgrade and Migration. This module explains how to plan a server upgrade and migration strategy.

Lessons

- Upgrade and Migration Considerations
- Creating a Server Upgrade and Migration Plan
- Planning for Virtualization

Module 40: Planning and Implementing a Server Deployment Infrastructure. This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

- Selecting an Appropriate Server Imaging Strategy
- Selecting a Deployment Automation Strategy
- Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain Strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

**Module 46: Designing and Implementing an Active Directory Domain Services Topology.** This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

**Module 47: Planning and Implementing Storage.** This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

**Module 48: Planning and Implementing File Services.** This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

**Module 49: Designing and Implementing Network Access Services.** This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
Module 55: Planning and Implementing a Virtualization Administration Solution. This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

Lessons

- Planning and Implementing Automation with System Center 2012
- Planning and Implementing System Center 2012 Administration
- Planning and Implementing Self-Service Options in System Center 2012

Module 56: Planning and Implementing a Server Monitoring Strategy. This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

Lessons

- Planning Monitoring in Windows Server 2012
- Overview of System Center Operations Manager
- Planning and Configuring Management Packs
- Planning and Configuration Notifications and Reporting
- Configuring Integration with VMM

Module 57: Planning and Implementing High Availability for File Services and Applications. This module explains how to plan and implement high availability for file services and applications.

Lessons

- Planning and Implementing Storage Spaces
- Planning and Implementing Distributed File System (DFS)
- Planning and Implementing Network Load Balancing (NLB)

Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering. This module explains how to plan and implement failover clustering.

Lessons

- Planning an Infrastructure for Failover Clustering
- Implementing Failover Clustering
- Integrating Failover Clustering with Server Virtualization
Planning a Multisite Failover Cluster

Module 59: Planning and Implementing Server Update Infrastructure. This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

Lessons

- Planning and Implementing a WSUS Deployment
- Planning Software Updates with System Center 2012 Configuration Manager
- Planning and Implementing Updates in a Server Virtualization Infrastructure
- Planning and Implementing Virtual Machine Backup and Recovery

Module 60: Planning and Implementing a Business Continuity Strategy. This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

Lessons

- Overview of Business Continuity Planning
- Planning and Implementing Backup Strategies
- Planning and Implementing Recovery
- Planning and Implementing Backup and Recovery of Virtual Machines

Module 61: Planning and Implementing an Public Key Infrastructure. This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

Lessons

- Planning and Implementing Deployment of a Certification Authority
- Planning and Implementing Certificate Templates
- Planning and Implementing Certificate Distribution and Revocation
- Planning and Implementing Key Archival and Recovery

Module 62: Planning and Implementing an Identity Federation Infrastructure. This module describes how to plan and implement an identity federation infrastructure.

Lessons

- Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
- Planning and Implementing AD FS Claims Providers and Relying Parties
- Planning and Implementing AD FS Claims and Claim Rules

Module 63: Planning and Implementing an Information Rights Management Infrastructure. This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
The Microsoft Certified Solutions Expert (MCSE): Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data center, with expertise in identity management, systems management, virtualization, storage, and networking. Earning an MCSE Server Infrastructure certification will qualify you for such jobs as computer support specialist and information security analyst. Upon successful completion of our Microsoft MCSE Server Infrastructure, students will have earned official Server 2012 MCSA and MCSE certifications and the credentials showing they have the upgraded Windows Server 2012 skills needed to confidently plan, deliver, operate, and manage Microsoft server infrastructure solutions across multiple solution areas in a business environment.

MCSE Candidate Profile

The MCSE certification is for IT professionals who are looking to validate that they have the skills and knowledge necessary to configure advanced services in a Windows Server 2012 infrastructure.

MCSE Server Infrastructure

The primary goal of this program is to help each student pass the exams required to earn the MCSE Server Infrastructure certification. To do this, your knowledgeable instructor will blend hands-on labs with lecture and practice exams to prepare you to pass each exam. The practice exams identify knowledge gaps that the instructor will fill with customized, hands-on labs and tailored lectures.

Course Outline

Module 1: Deploying and Managing Windows Server 2012. This module introduces the new Windows Server 2012 administrative interface. This module covers the different roles and features that are available with the Windows Server 2012 operating system. It also discusses the various installation and configuration options you can use when deploying and configuring Windows Server 2012.

Lessons

- Windows Server 2012 Overview
- Overview of Windows Server 2012 Management
- Installing Windows Server 2012
- Post-Installation Configuration of Windows Server 2012
- Introduction to Windows PowerShell
Module 2: Introduction to Active Directory Domain Services. This module introduces Active Directory Domain Services (AD DS) in Windows Server 2012. It covers general AD DS infrastructure including forests, trees, schema, Global Catalog, and Operations Masters. It also covers installing and configuring domain controllers.

Lessons

- Overview of AD DS
- Overview of Domain Controllers
- Installing a Domain Controller

Module 3: Managing Active Directory Domain Services Objects. This module covers configuring Active Directory objects such as users, groups and computers. The functionality of AD DS administrative tools is addressed, in addition to the configuration of user profiles and the process of delegating permissions to perform AD DS administration.

Lessons

- Managing User Accounts
- Managing Group Accounts
- Managing Computer Accounts
- Delegating Administration

Module 4: Automating Active Directory Domain Services Administration. This module covers using command-line tools to configure and administer AD DS. It introduces using Windows PowerShell cmdlets for AD DS administration, and using Windows PowerShell to perform bulk AD DS administrative operations.

Lessons

- Using Command-line Tools for AD DS Administration
- Using Windows PowerShell for AD DS Administration
- Performing Bulk Operations with Windows PowerShell


Lessons

- Overview of TCP/IP
- Understanding IPv4 Addressing
- Subnetting and Supernetting
- Configuring and Troubleshooting IPv4
Module 6: Implementing Dynamic Host Configuration Protocol. This module covers the installation and configuration of DHCP in addition to managing a DHCP database. It also covers security and monitoring of DHCP, including auditing and logging.

Lessons

- Installing a DHCP Server Role
- Configuring DHCP Scopes
- Managing a DHCP Database
- Securing and Monitoring DHCP

Module 7: Implementing Domain Name System. This module covers name resolution for Windows Server and clients. It details the installation of a Domain Name System (DNS) server and configuring Active Directory Integrated DNS zones.

Lessons

- Name Resolution for Windows Client and Servers
- Installing and Managing a DNS Server
- Managing DNS Zones

Module 8: Implementing IPv6. This module covers understanding and implementing IPv6 addressing. It covers configuration and troubleshooting as well as co-existence with IPv4 using transition technologies.

Lessons

- Overview of IPv6
- IPv6 Addressing
- Coexistence with IPv6
- IPv6 Transition Technologies

Module 9: Implementing Local Storage. This module covers the storage configuration options for Windows Server 2012, including managing disks and volumes and implementing file systems. It also covers creating and managing storage pools.

Lessons

- Overview of Storage
- Managing Disks and Volumes
- Implementing Storage Spaces

Module 10: Implementing File and Print Services. This module covers securing files, folders and network file shares, in addition to using shadow copies to protect network file shares. It also covers configuring network printing and creating a printer pool.
Lessons

- Securing Files and Folders
- Protecting Shared Files and Folders by Using Shadow Copies
- Configuring Network Printing

Module 11: Implementing Group Policy. This module covers using Group Policy to centrally manage and apply configuration settings.

Lessons

- Overview of Group Policy
- Group Policy Processing
- Implementing a Central Store for Administrative Templates


Lessons

- Windows Operating Systems Security Overview
- Configuring Security Settings
- Restricting Software
- Configuring Windows Firewall with Advanced Security

Module 13: Implementing Server Virtualization with Hyper-V. This module describes Microsoft Virtualization technologies. It covers installing and configuring Hyper-V virtual machines, configuring virtual storage, and configuring virtual networks.

Lessons

- Overview of Virtualization Technologies
- Implementing Hyper-V
- Managing Virtual Machine Storage
- Managing Virtual Networks

Module 14: Deploying and Maintaining Server Images. This module explains the functionality of Windows Deployment Services, and explains how to use Windows Deployment Services tools to perform lite-touch deployments.

Lessons

- Overview of Windows Deployment Services
- Implementing Deployment with Windows Deployment Services
- Administering Windows Deployment Services
Module 15: Configuring and Troubleshooting Domain Name System. This module explains how the Domain Name System (DNS) is the foundation name service in Windows Server 2012. It provides name resolution, and enables DNS clients to locate network services, such as AD DS domain controllers, global catalog servers, and messaging servers. If you configure your DNS infrastructure poorly, or it is not working correctly, these important network services will be inaccessible to your network servers and clients. Consequently, it is vital that you understand how to deploy, configure, manage, and troubleshoot this critical service.

Lessons

- Installing the DNS Server Role
- Configuring the DNS Server Role
- Configuring DNS Zones
- Configuring DNS Zone Transfers
- Managing and Troubleshooting DNS

Module 16: Maintaining Active Directory Domain Services. This module explains the new features, such as virtualized domain controller cloning, recent features like read-only domain controllers (RODCs), and a host of other features and tools that you can use in the AD DS environment.

Lessons

- Overview of AD DS
- Implementing Virtualized Domain Controllers
- Implementing RODC
- Administering AD DS
- Managing the AD DS Database

Module 17: Managing User and Service Accounts. This module explains how to manage large groups of user accounts, explain the different options available for providing adequate password security for accounts in your environment, and show you how to configure accounts to provide authentication for system services and background processes.

Lessons

- Automating User Account Management
- Configuring Password-Policy and User-Account Lockout Settings
- Configuring Managed Service Accounts

Module 18: Implementing a Group Policy Infrastructure. This module explains Group Policy is, how it works, and how best to implement it in your organization.

Lessons

- Introducing Group Policy
- Implementing and Administering Group Policy Objects (GPOs)
- Group Policy Scope and Group Policy Processing
Troubleshooting the Application of GPOs

Module 19: Managing User Desktops with Group Policy. This module explains how to configure Administrative Templates.

Lessons

- Implementing Administrative Templates
- Configuring Folder Redirection and Scripts
- Configuring Group Policy Preferences
- Managing Software with Group Policy

Module 20: Configuring and Troubleshooting Remote Access. This module explains how to configure and secure your remote access clients by using network.

Lessons

- Configuring Network Access
- Configuring Virtual Private Network (VPN) Access
- Overview of Network Policies
- Troubleshooting Routing and Remote Access
- Configuring DirectAccess

Module 21: Installing, Configuring, and Troubleshooting the Network Policy Server Role. This module explains how to install, configure, and troubleshoot Network Policy Server (NPS).

Lessons

- Installing and Configuring a NPS
- Configuring Remote Authentication Dial-In User Service (RADIUS) Clients and Servers
- NPS Authentication Methods
- Monitoring and Troubleshooting a NPS

Module 22: Implementing Network Access Protection. This module explains how to create customized health requirement policies to validate computer health before allowing access or communication with NAP.

Lessons

- Overview of Network Access Protection
- Overview of NAP Enforcement Processes
- Configuring NAP
- Monitoring and Troubleshooting NAP

Module 23: Optimizing File Services. This module explains how to use File Server Resource Manager (FSRM) to place quotas on storage volumes, screen files and folders, generate comprehensive storage reports, control the file classification infrastructure, and use file management tasks to perform scheduled actions on sets of files.
Lessons

- Overview of FSRM
- Using FSRM to Manage Quotas, File Screens, and Storage Reports
- Implementing Classification and File Management Tasks
- Overview of Distributed File System (DFS)
- Configuring DFS Namespaces
- Configuring and Troubleshooting Distributed File System Replication (DFS-R)

**Module 24: Configuring Encryption and Advanced Auditing.** This module describes how to use Windows Server 2012 tools to help you to provide increased file system security on your servers.

Lessons

- Encrypting Files by Using Encrypting File System
- Configuring Advanced Auditing

**Module 25: Implementing Update Management.** This module introduces key features of the Windows Server Update Services (WSUS) server role.

Lessons

- Overview of WSUS
- Deploying Updates with WSUS

**Module 26: Monitoring Windows Server 2012.** This module explains how to improve performance using performance monitoring tools to identify components that require additional tuning and troubleshooting.

Lessons

- Monitoring Tools
- Using Performance Monitor
- Monitoring Event Logs

**Module 27: Implementing Advanced Network Services.** This module describes how to configure advanced features in the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) with Windows Server 2012, and it covers IP Address Management (IPAM).

Lessons

- Configuring Advanced DHCP Features
- Configuring Advanced DNS Settings
- Implementing IPAM
Module 28: Implementing Advanced File Services. This module describes how to configure and manage iSCSI and BranchCache, and how to implement Windows 2012 features that optimize storage utilization, such as File Server Resource Manager, file classification, and data duplication.

Lessons

- Configuring iSCSI Storage
- Configuring BranchCache
- Optimizing Storage Usage

Module 29: Implementing Dynamic Access Control. This module describes how to plan and implement Dynamic Access Control.

Lessons

- Overview of Dynamic Access Control
- Planning for Dynamic Access Control
- Deploying Dynamic Access Control

Module 30: Implementing Distributed Active Directory Domain Services Deployments. This module describes the components of a highly complex AD DS deployment, which includes implementing a distributed AD DS deployment and configuring AD DS forest trusts.

Lessons

- Overview of Distributed AD DS Deployments
- Deploying a Distributed AD DS Environment
- Configuring AD DS Trusts

Module 31: Implementing Active Directory Domain Services Sites and Replication. This module describes how replication works in a Windows Server 2012 AD DS environment, including how to configure AD DS sites so that you can optimize AD DS network traffic and how to configure and monitor AD DS replication.

Lessons

- Overview of AD DS Replication
- Configuring AD DS Sites
- Configuring and Monitoring AD DS Replication

Module 32: Implementing Active Directory Certificate Services. This module describes the Public Key Infrastructure (PKI) components and concepts. It covers implementing a certification authority infrastructure, planning and implementing a certificate template deployment using an AD CS certification authority, and planning and implementing certificate distribution and revocation.

Lessons

PKI Overview
Module 33: Implementing Active Directory Rights Management Services. This module describes the AD RMS features and functionality. It explains how to use AD RMS to configure content protection, and deploy and manage an AD RMS infrastructure.

Lessons

- AD RMS Overview
- Deploying and Managing an AD RMS Infrastructure
- Configuring AD RMS Content Protection
- Configuring External Access to AD RMS

Module 34: Implementing Active Directory Federation Services. This module provides identity federation business scenarios, and it describes how to use AD FS to address such scenarios. It explains how to configure AD FS prerequisites, deploy AD FS services, enable single sign-on (SSO) for an organization, and enable SSO between federated business partners.

Lessons

- Overview of AD FS
- Deploying AD FS
- Implementing AD FS for a Single Organization
- Deploying AD FS in a B2B Federation Scenario

Module 35: Implementing Network Load Balancing. This module describes how to plan and implement NLB. It will cover managing and configuring an NLB cluster and validating high availability for an NLB cluster.

Lessons

- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Module 36: Implementing Failover Clustering. This module describes the failover clustering features in Windows Server 2012. It explains how to implement a failover cluster, configure highly available applications and services on a failover cluster, maintain a failover cluster, and use new maintenance features such as Cluster Aware Updating (CAU). It will also cover how to implement multi-site failover clustering.

Lessons

- Overview of Failover Clustering
- Implementing a Failover Cluster
- Configuring Highly Available Applications and Services on a Failover Cluster
- Maintaining a Failover Cluster
- Implementing a Multi-Site Failover Cluster

**Module 37: Implementing Failover Clustering with Hyper-V.** This module describes the options for making virtual machines highly available. It explains how to implement virtual machines in a failover cluster that was deployed on a host and how you can move a virtual machine or its storage. In addition, it provides a high-level overview of System Center Virtual Machine Manager (SCVMM) 2012.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering
- Implementing Hyper-V Virtual Machines on Failover Clusters
- Implementing Hyper-V Virtual Machine Movement
- Managing Hyper-V Virtual Environments by Using VMM

**Module 38: Implementing Disaster Recovery.** This module describes considerations for implementing a disaster recovery solution, and how to plan and implement a backup solution for Windows Server 2012. In addition, it explains how to plan and implement server and data recovery using Windows Server backup and Microsoft Online backup.

Lessons

- Overview of Disaster Recovery
- Implementing Windows Server Backup
- Implementing Server and Data Recovery

**Module 39: Planning a Server Upgrade and Migration.** This module explains how to plan a server upgrade and migration strategy.

Lessons

- Upgrade and Migration Considerations
- Creating a Server Upgrade and Migration Plan
- Planning for Virtualization

**Module 40: Planning and Implementing a Server Deployment Infrastructure.** This module explains how to design an automated server installation strategy and plan and implement a server deployment infrastructure strategy.

Lessons

- Selecting an Appropriate Server Imaging Strategy
- Selecting a Deployment Automation Strategy
- Implementing an Automated Deployment Strategy
Module 41: Designing and Maintaining an IP Configuration and Address Management Solution. This module explains how to design and maintain IP address management (IPAM) and a Dynamic Host Configuration Protocol (DHCP) strategy.

Lessons

- Designing and Implementing DHCP
- Planning and Implementing DHCP Scopes
- Planning and Implementing an IPAM Provisioning Strategy

Module 42: Designing and Implementing Name Resolution. This module explains how to design a name resolution solution strategy.

Lessons

- Designing a Domain Name System (DNS) Server Implementation Strategy
- Designing the DNS Namespace
- Designing and Implementing DNS Zones
- Designing and Configuring DNS Zone Replication and Delegation
- Optimizing DNS Servers
- Designing DNS for High Availability and Security

Module 43: Designing and Implementing an Active Directory Domain Services Forest and Domain Infrastructure. This module explains how to design and implement an Active Directory Domain Services (AD DS) forest and domain strategy.

Lessons

- Designing an AD DS Forest
- Designing and Implementing AD DS Forest Trusts
- Designing and Implementing AD DS Domains
- Designing DNS Namespaces in AD DS Environments
- Designing AD DS Domain Trusts

Module 44: Designing and Implementing an Active Directory Organizational Unit Infrastructure. This module explains how to design and implement an organizational unit (OU) infrastructure and AD DS permissions strategy.

Lessons

- Planning the Active Directory Administrative Tasks Delegation Model
- Designing the OU Structure
- Designing and Implementing an Active Directory Group Strategy

Module 45: Designing and Implementing a Group Policy Object Strategy. This module explains how to design and implement a Group Policy Object (GPO).
Lessons

- Gathering the Information Required for a GPO Design
- Designing and Implementing GPOs
- Designing GPO Processing
- Planning Group Policy Management

Module 46: Designing and Implementing an Active Directory Domain Services Topology. This module explains how to design an AD DS sites topology and a domain controller placement strategy.

Lessons

- Designing and Implementing AD DS Sites
- Designing AD DS Replication
- Designing the Placement of Domain Controllers
- Virtualization Considerations for Domain Controllers
- Designing Highly Available Domain Controllers

Module 47: Planning and Implementing Storage. This module explains how to plan and implement storage.

Lessons

- Storage Considerations
- Planning and Implementing iSCSI SANs
- Storage Spaces in Windows Server 2012

Module 48: Planning and Implementing File Services. This module explains how to plan and implement file services.

Lessons

- Planning and Implementing DFS
- Planning and Implementing BranchCache
- Planning and Implementing Dynamic Access Control

Module 49: Designing and Implementing Network Access Services. This module explains how to design and implement network access services.

Lessons

- Designing and Implementing Remote Access Services
- Designing RADIUS Authentication by Using NPS
- Designing a Perimeter Network
- Planning and Implementing DirectAccess
Module 50: Designing and Implementing Network Protection. This module explains how to design and implement network protection.

Lessons

- Overview of Network Security Design
- Identifying and Mitigating Common Network Security Threats
- Designing and Implementing a Windows Firewall Strategy
- Designing and Implementing a NAP Infrastructure

Module 51: Overview of Management in an Enterprise Data Center. This module describes some of the changes and new requirements that organizations are experiencing in their data centers. The module then describes how you can use System Center 2012 to manage this environment.

Lessons

- Overview of the Enterprise Data Center
- Overview of the Microsoft System Center 2012 Components
- Considerations for Implementing an Enterprise Data Center

Module 52: Planning and Implementing a Server Virtualization Strategy. This module introduces the Microsoft System Center 2012 components. You will see how they can integrate to enable you to configure, deploy, and manage a server virtualization environment. Later, you will review the planning steps and considerations for a Microsoft System Center 2012 - Virtual Machine Manager (VMM) deployment.

Lessons

- Planning a VMM Deployment
- Planning and Implementing a Server Virtualization Host Environment
- Planning and Implementing a Network Infrastructure for Virtualization

Module 53: Planning and Implementing Networks and Storage for Virtualization. This module describes the factors that you must consider when you are planning the storage and network infrastructure for your virtual environment, and details on how to deploy these components in Windows Server 2012 Hyper-V and VMM.

Lessons

- Planning a Storage Infrastructure for Virtualization
- Implementing a Storage Infrastructure for Virtualization
- Planning and Implementing a Network Infrastructure for Virtualization

Module 54: Planning and Deploying Virtual Machines. In this module, you will learn how to configure virtual machines, reusable profiles, and templates to aid in deployment. You also will review application specific workloads, and learn about the options for physical and virtual machine migrations.

Lessons
Module 55: Planning and Implementing a Virtualization Administration Solution. This module will prepare you for designing an administrative model that you can use to manage virtualization using System Center 2012. You will see and use VMM, Microsoft System Center 2012 – Orchestrator (Orchestrator) and Microsoft System Center 2012 – App Controller (App Controller). Use these components to delegate administrative functions, plan for basic self-service, design and implement automation. The skills gained in this module are the foundation for the basic building blocks used to operate an IT infrastructure that is similar or equal to that of cloud computing.

Lessons

- Planning and Implementing Automation with System Center 2012
- Planning and Implementing System Center 2012 Administration
- Planning and Implementing Self-Service Options in System Center 2012

Module 56: Planning and Implementing a Server Monitoring Strategy. This module explains how to use the monitoring tools included in Windows Server 2012 and Microsoft System Center 2012 – Operations Manager (Operations Manager).

Lessons

- Planning Monitoring in Windows Server 2012
- Overview of System Center Operations Manager
- Planning and Configuring Management Packs
- Planning and Configuration Notifications and Reporting
- Configuring Integration with VMM

Module 57: Planning and Implementing High Availability for File Services and Applications. This module explains how to plan and implement high availability for file services and applications.

Lessons

- Planning and Implementing Storage Spaces
- Planning and Implementing Distributed File System (DFS)
- Planning and Implementing Network Load Balancing (NLB)

Module 58: Planning and Implementing a High Availability Infrastructure Using Failover Clustering. This module explains how to plan and implement failover clustering.

Lessons

- Planning an Infrastructure for Failover Clustering
- Implementing Failover Clustering
- Integrating Failover Clustering with Server Virtualization
Planning a Multisite Failover Cluster

Module 59: Planning and Implementing Server Update Infrastructure. This module explains how to plan and implement server update infrastructure by using Windows Server Update Service (WSUS), Configuration Manager, and VMM.

Lessons

- Planning and Implementing a WSUS Deployment
- Planning Software Updates with System Center 2012 Configuration Manager
- Planning and Implementing Updates in a Server Virtualization Infrastructure
- Planning and Implementing Virtual Machine Backup and Recovery

Module 60: Planning and Implementing a Business Continuity Strategy. This module explains how to plan and implement a business-continuity strategy for your organization, and how to plan and implement backup and recovery strategies, including virtual-machine backup and recovery.

Lessons

- Overview of Business Continuity Planning
- Planning and Implementing Backup Strategies
- Planning and Implementing Recovery
- Planning and Implementing Backup and Recovery of Virtual Machines

Module 61: Planning and Implementing an Public Key Infrastructure. This module explains how to plan and implement the various aspects of a PKI, and build an internal PKI by using AD CS.

Lessons

- Planning and Implementing Deployment of a Certification Authority
- Planning and Implementing Certificate Templates
- Planning and Implementing Certificate Distribution and Revocation
- Planning and Implementing Key Archival and Recovery

Module 62: Planning and Implementing an Identity Federation Infrastructure. This module describes how to plan and implement an identity federation infrastructure.

Lessons

- Planning and Implementing an Active Directory Federation Services (AD FS) Server Infrastructure
- Planning and Implementing AD FS Claims Providers and Relying Parties
- Planning and Implementing AD FS Claims and Claim Rules

Module 63: Planning and Implementing an Information Rights Management Infrastructure. This module explains how to plan and implement an Active Directory Rights Management Services (AD RMS) deployment to protect content.
Lessons

- Planning and Implementing an AD RMS Cluster
- Planning and Implementing AD RMS Templates and Policies
- Planning and Implementing External Access to AD RMS Services
- Planning and Implementing AD RMS Integration with Dynamic Access Control (DAC)
This course will provide you with the knowledge and skills to plan, deploy, manage, secure, and support Microsoft Exchange Server 2013. This course will teach you how to configure Exchange Server 2013 and supply you with the information you will need to monitor, maintain, and troubleshoot Exchange Server 2013. This course will also provide guidelines, best practices, and considerations that will help you optimize performance and minimize errors and security threats in Exchange Server 2013.

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. They are not expected to have experience with previous Exchange Server versions.

At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Server 2013.
- Plan for disaster mitigation, implement backup up and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solutions, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Module 1: Deploying and Managing Microsoft Exchange Server 2013

This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.
Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

Module 2: Planning and Configuring Mailbox Servers.
This module describes how to plan and configure the Mailbox server role.

Lessons

- Overview of the Mailbox Server Role
- Planning the Mailbox Server Deployment
- Configuring the Mailbox Servers

Module 3: Managing Recipient Objects,
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

- Managing Exchange Server 2013 Mailboxes
- Managing Other Exchange Recipients
- Planning and Implementing Public Folder Mailboxes
- Managing Address Lists and Policies

Module 4: Planning and Deploying Client Access Servers.
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

- Planning Client Access Server Deployment
- Configuring the Client Access Server Role
- Managing Client Access Services

Module 5: Planning and Configuring Messaging Client Connectivity.
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

- Client Connectivity to the Client Access Server
- Configuring Outlook Web App
- Planning and Configuring Mobile Messaging
- Configuring Secure Internet Access for Client Access Server
Module 6: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Module 7: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 8: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 9: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 10: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
• Configuring Audit Logging

**Module 11: Monitoring and Troubleshooting Microsoft Exchange Server 2013.**
This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

**Lessons**

- Monitoring Exchange Server 2013
- Maintaining Exchange Server 2013
- Troubleshooting Exchange Server 2013
About this Course

This course will provide you with the knowledge and skills to plan, deploy, manage, secure, and support Microsoft Exchange Server 2013. This course will teach you how to configure Exchange Server 2013 and supply you with the information you will need to monitor, maintain, and troubleshoot Exchange Server 2013. This course will also provide guidelines, best practices, and considerations that will help you optimize performance and minimize errors and security threats in Exchange Server 2013.

MCSE Candidate Profile

This course is intended for people aspiring to be enterprise-level messaging administrators. Others who may take this course include IT generalists and help desk professionals who want to learn about Exchange Server 2013. People coming into the course are expected to have at least 3 years of experience working in the IT field—typically in the areas of network administration, help desk, or system administration. They are not expected to have experience with previous Exchange Server versions.

At Course Completion

After completing this course, students will be able to:

- Deploy and manage Exchange Server 2013.
- Plan and configure the Mailbox server role.
- Manage recipient objects, address policies, and address lists in Exchange Server 2013.
- Plan and implement the Client Access server role in Exchange Server 2013.
- Securely plan and configure Microsoft Outlook Web App and mobile messaging using the Client Access server.
- Understand and manage highly available Client Access servers in Exchange Server 2013.
- Plan for disaster mitigation, implement back up and recovery for Exchange Server 2013.
- Plan and configure message transport in an Exchange Server 2013 organization.
- Plan message security options, implement an antivirus solutions, and implement an anti-spam solution.
- Configure permissions and secure Exchange Server 2013.
- Monitor, maintain, and troubleshoot an Exchange Server 2013 environment.

Module 1: Deploying and Managing Microsoft Exchange Server 2013

This module describes Exchange Server 2013 prerequisites and requirements, deployment and management.
Lessons

- Exchange Server 2013 Prerequisites and Requirements
- Exchange Server 2013 Deployment
- Managing Exchange Server 2013

**Module 2: Planning and Configuring Mailbox Servers.**
This module describes how to plan and configure the Mailbox server role.

Lessons

- Overview of the Mailbox Server Role
- Planning the Mailbox Server Deployment
- Configuring the Mailbox Servers

**Module 3: Managing Recipient Objects,**
This module explains how to manage recipient objects, address policies, and address lists in Exchange Server 2013.

Lessons

- Managing Exchange Server 2013 Mailboxes
- Managing Other Exchange Recipients
- Planning and Implementing Public Folder Mailboxes
- Managing Address Lists and Policies

**Module 4: Planning and Deploying Client Access Servers.**
This module explains how to plan and implement the Client Access server role in Exchange Server 2013.

Lessons

- Planning Client Access Server Deployment
- Configuring the Client Access Server Role
- Managing Client Access Services

**Module 5: Planning and Configuring Messaging Client Connectivity.**
This module explains how to plan and configure Microsoft Outlook Web App and mobile messaging in Exchange Server 2013.

Lessons

- Client Connectivity to the Client Access Server
- Configuring Outlook Web App
- Planning and Configuring Mobile Messaging
- Configuring Secure Internet Access for Client Access Server
Module 6: Planning and Implementing High Availability.
This module explains the high-availability technology built into Exchange Server 2013, and some of the outside factors that affect highly available solutions.

Lessons

- High Availability on Exchange Server 2013
- Configuring Highly Available Mailbox Databases
- Configuring Highly Available Client Access Servers

Module 7: Planning and Implementing Disaster Recovery
This module explains how to plan, implement disaster mitigation, and recovery in Exchange Server 2013.

Lessons

- Planning for Disaster Mitigation
- Planning and Implementing Exchange Server 2013 Backup
- Planning and Implementing Exchange Server 2013 Recovery

Module 8: Planning and Configuring Message Transport.
This module explains how to plan and configure message transport in an Exchange Server 2013 organization.

Lessons

- Overview of Message Transport and Routing
- Planning and Configuring Message Transport
- Managing Transport Rules

Module 9: Planning and Configuring Message Hygiene
This module explains how to plan messaging security, implement an antivirus and anti-spam solution for Exchange Server 2013.

Lessons

- Planning Messaging Security
- Implementing an Antivirus Solution for Exchange Server 2013
- Implementing an Anti-Spam Solution for Exchange Server 2013

Module 10: Planning and Configuring Administrative Security and Auditing
This module explains how to configure role-based access control (RBAC) permissions and configure audit logging.

Lessons

- Configuring Role-Based Access Control
• Configuring Audit Logging

This module explains how to monitor, maintain, and troubleshoot your Exchange Server 2013 environment.

Lessons

• Monitoring Exchange Server 2013
• Maintaining Exchange Server 2013
• Troubleshooting Exchange Server 2013
Advanced Solutions of Microsoft Exchange Server 2013
Course 20342

About this Course

This course will provide you with the knowledge and skills to configure and manage a Microsoft Exchange Server 2013 messaging environment. This course will teach you how to configure Exchange Server 2013, and it will provide guidelines, best practices, and considerations that will help you optimize your Exchange Server deployment.

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At Course Completion

After completing this course, students will be able to:

- Design and implement site resiliency for Exchange Server 2013.
- Plan a virtualization strategy for Exchange Server 2013 roles.
- Design and implement message transport security.
- Design and implement message retention in Exchange Server 2013.
- Design and implement messaging compliance.
- Design and implement administrative security in an Exchange Server 2013 environment.
- Use the Windows PowerShell 3.0 command-line interface to manage Exchange Server 2013.
- Design and implement integration with Exchange Online.
- Design and implement messaging coexistence.
- Design and implement Exchange Server migrations from non-Exchange messaging systems, and upgrades from previous Exchange Server versions.

Course Outline

Module 1: Designing and Implementing Site Resilience.
This module explains how to design and implement site resilience for Exchange Server 2013.
Lessons

- Site Resilience and High Availability in Exchange Server 2013
- Planning a Site Resilient Implementation
- Implementing Site Resilience

**Module 2: Planning Virtualization for Microsoft Exchange Server 2013.**
This module explains how to plan a virtualization strategy for Exchange Server 2013 roles.

Lessons

- Planning a Hyper-V Deployment to Exchange Server 2013
- Virtualizing Exchange Server 2013 Server Roles

**Module 3: Overview of Exchange Server 2013 Unified Messaging.**
This module explains the basic concept of Unified Messaging in Exchange Server 2013.

Lessons

- Overview of Telephony Technologies
- Unified Messaging in Exchange Server 2013
- Unified Messaging Components

**Module 4: Designing and Implementing Exchange Server 2013 Unified Messaging.**
This module explains how to design and implement Exchange Server 2013 Unified Messaging.

Lessons

- Designing a Unified Messaging Deployment
- Deploying and Configuring Unified Messaging Components
- Designing and Implementing Exchange Server 2013 UM Integration with Lync Server 2013

**Module 5: Designing and Implementing Message Transport Security.**
This module explains how to design and implement message transport security.

Lessons

- Overview of Messaging Policy and Compliance Requirements
- Designing and Implementing Transport Compliance
- Designing and Implementing Active Directory Rights Management Services (AD RMS) Integration with Exchange Server 2013

**Module 6: Designing and Implementing Message Retention.**
This module explains how to design and implement message retention in Exchange Server 2013.

Lessons
• Overview of Messaging Records Management and Archiving
• Designing In-Place Archiving
• Designing and Implementing Message Retention

**Module 7: Designing and Implementing Messaging Compliance.**
This module explains how to design and implement messaging compliance.

**Lessons**

• Designing and Implementing Data Loss Prevention
• Designing and Implementing In-Place Hold
• Designing and Implementing In-Place eDiscovery

**Module 8: Designing and Implementing Administrative Security and Auditing.**
This module explains how to design and implement administrative security in an Exchange Server 2013 environment.

**Lessons**

• Designing and Implementing Role-Based Access Control (RBAC)
• Designing and Implementing Split Permissions
• Planning and Implementing Audit Logging

**Module 9: Managing Exchange Server 2013 with Exchange Management Shell.**
This module explains how to use Windows PowerShell 3.0 to manage Exchange Server 2013.

**Lessons**

• Overview of Windows PowerShell 3.0
• Managing Exchange Server Recipients by Using the Exchange Management Shell
• Using Windows PowerShell to Manage Exchange Server

**Module 10: Designing and Implementing Integration with Microsoft Exchange Online.**
This module explains how to design and implement integration with Exchange Online.

**Lessons**

• Planning for Exchange Online
• Planning and Implementing the Migration to Exchange Online
• Planning to Coexist with Exchange Online

**Module 11: Designing and Implementing Messaging Coexistence.**
This module explains how to design and implement messaging coexistence.

**Lessons**
• Designing and Implementing Federation
• Designing Coexistence Between Exchange Server Organizations
• Designing and Implementing Cross-Forest Mailbox Moves

**Module 12: Designing and Implementing Exchange Server Upgrades.**
This module explains how to design and implement upgrades from previous Exchange Server versions.

**Lessons**

• Planning the Upgrade from Previous Exchange Server Versions
• Implementing the Upgrade from Previous Exchange Versions
Advanced Solutions of Microsoft Exchange Server 2013
Course 20342

Length: 5 days
Audience: IT Professionals
Technology: Microsoft Exchange Server
Delivery Method: Instructor-Led Classroom

About this Course

This course will provide you with the knowledge and skills to configure and manage a Microsoft Exchange Server 2013 messaging environment. This course will teach you how to configure Exchange Server 2013, and it will provide guidelines, best practices, and considerations that will help you optimize your Exchange Server deployment.

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- Plan a virtualization strategy for Exchange Server 2013 roles.
- Design and implement message transport security.
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- Design and implement messaging compliance.
- Design and implement administrative security in an Exchange Server 2013 environment.
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This module explains how to design and implement site resilience for Exchange Server 2013.
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This module explains how to design and implement Exchange Server 2013 Unified Messaging.

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- Designing a Unified Messaging Deployment
- Deploying and Configuring Unified Messaging Components
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This module explains how to design and implement message transport security.

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**Lessons**

• Planning the Upgrade from Previous Exchange Server Versions
• Implementing the Upgrade from Previous Exchange Versions
Object-Oriented Analysis and Design Using UML

About this Course

This Object-Oriented Analysis and Design Using UML training teaches you how to effectively use object-oriented technologies and software modeling as applied to a software development process. Expert Oracle University instructors present one practical, complete, object-oriented analysis and design (OOAD) road map from requirements gathering to system design.

Audience Profile

System architects, software engineers, systems analysts and designers responsible for the conception and creation of object-oriented software applications will find the most value in taking this course. Architects responsible for the conception and creation of object-oriented software applications can also benefit from this educational investment.

At Course Completion

After completing this course, students will be able to:

- Describe the object-oriented software development process, including object-oriented methodologies and workflows
- Gather system requirements through interviews with stakeholders
- Analyze system requirements to determine the use cases and domain model of the problem domain (the Requirements model)
- Create a system architecture (the Architecture model) supporting the nonfunctional requirements (NFRs) and development constraints
- Create a system design (the Solution model) supporting the functional requirements (FRs)

Prerequisites

- Understand object-oriented concepts and methodology
- Demonstrate a general understanding of programming, preferably using the Java programming language
- Understand the fundamentals of the systems development process

Course Outline

Examining Object-Oriented Concepts and Terminology

- Describe the important object-oriented (OO) concepts
- Describe the fundamental OO terminology

Introducing Modeling and the Software Development Process

- Describe the Object-Oriented Software Development (OOSD) process
- Describe how modeling supports the OOSD process
• Describe the benefits of modeling software
• Explain the purpose, activities, and artifacts of the following OOSD workflows (disciplines): Requirements Gathering, Requirements Analysis, Architecture, Design, Implementation, Testing & Deployment

Creating Use Case Diagrams
• Justify the need for a Use Case diagram
• Identify and describe the essential elements in a UML Use Case diagram
• Develop a Use Case diagram for a software system based on the goals of the business owner
• Develop elaborated Use Case diagrams based on the goals of all the stakeholders
• Recognize and document use case dependencies using UML notation for extends, includes, and generalization
• Describe how to manage the complexity of Use Case diagrams by creating UML packaged views

Creating Use Case Scenarios and Forms
• Identify and document scenarios for a use case
• Create a Use Case form describing a summary of the scenarios in the main and alternate flows
• Describe how to reference included and extending use cases.
• Identify and document non-functional requirements (NFRs), business rules, risks, and priorities for a use case
• Identify the purpose of a Supplementary Specification Document

Determining the Key Abstractions
• Identify a set of candidate key abstractions
• Identify the key abstractions using CRC analysis

Constructing the Problem Domain Model
• Identify the essential elements in a UML Class diagram
• Construct a Domain model using a Class diagram
• Identify the essential elements in a UML Object diagram
• Validate the Domain model with one or more Object diagrams

Transitioning from Analysis to Design using Interaction Diagrams
• Explain the purpose and elements of the Design model
• Identify the essential elements of a UML Communication diagram
• Create a Communication diagram view of the Design model
• Identify the essential elements of a UML Sequence diagram
• Create a Sequence diagram view of the Design model

Modeling Object State Using State Machine Diagrams
• Model object state
• Describe the essential elements of a UML State Machine diagram

Applying Design Patterns to the Design Model
• Define the essential elements of a software pattern
• Describe the Composite pattern
• Describe the Strategy pattern
• Describe the Observer pattern
• Describe the Abstract Factory pattern

Creating Activity Diagrams
• Identify the essential elements in an Activity diagram
• Model a Use Case flow of events using an Activity diagram
Introducing Architectural Concepts and Diagrams

- Distinguish between architecture and design
- Describe tiers, layers, and systemic qualities
- Describe the Architecture workflow
- Describe the diagrams of the key architecture views
- Select the Architecture type
- Create the Architecture workflow artifacts

Introducing the Architectural Tiers

- Describe the concepts of the Client and Presentation tiers
- Describe the concepts of the Business tier
- Describe the concepts of the Resource and Integration tiers
- Describe the concepts of the Solution model

Refining the Class Design Model

- Refine the attributes of the Domain model
- Refine the relationships of the Domain model
- Refine the methods of the Domain model
- Declare the constructors of the Domain model
- Annotate method behavior
- Create components with interfaces

Overview of Software Development Processes

- Explain the best practices for OOSD methodologies
- Describe the features of several common methodologies
- Choose a methodology that best suits your project
- Develop an iteration plan

Overview of Frameworks

- Define a framework
- Describe the advantages and disadvantages of using frameworks
- Identify several common frameworks
- Understand the concept of creating your own business domain frameworks

Course Review

- Review the key features of object orientation
- Review the key UML diagrams
- Review the Requirements Analysis (Analysis) and Design workflows
Oracle Database 11g: Administration Workshop I

Course#: ORCL-1102
Exams: 1Z0-052

Length: 5 Days
Audience: Database Administrators, Developers
Type: Course
Delivery Method: Instructor-Led (Classroom)

About this Course

This Oracle Database 11g: Administration Workshop I course explores the fundamentals of basic database administration. Our expert instructors will reinforce topics with structured hands-on practices that will prepare you for the corresponding Oracle Certified Associate exam.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

You will also learn how to create an operational database and properly manage the various structures in an effective and efficient manner. This includes performance monitoring, database security, user management and backup/recovery techniques.

Course Objectives

- Install Oracle Grid Infrastructure
- Install and configure Oracle Database 11g
- Configure Oracle Net services
- Monitor and administer undo data
- Manage the database storage structures
- Create and administer user accounts
- Perform basic backup and recovery of a database
- Manage data concurrency
- Monitor performance
- Describe Oracle Database Architecture

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant
- Java Developer
### Prerequisite

Oracle Introduction to SQL course or equivalent experience

### At Course Completion

After completing this course, students will be able to:

- Install Oracle Grid Infrastructure.
- Create and manage users.
- Install and configure an Oracle Database.
- Create and manage storage structures.
- Administer the Oracle Database.
- Understand the Oracle database architecture and how its components work and interact with one another.
- Perform backup and recovery.

### Course Outline

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- Storage Structures
- How Table Data Is Stored
- Anatomy of a Database Block
- Space Management in Tablespaces
- Tablespaces in the Preconfigured Database
- Actions with Tablespaces
- Oracle Managed Files (OMF)

Managing Data Concurrency

- Data Concurrency
- Enqueue Mechanism
- Resolving Lock Conflicts
- Deadlocks

Managing Undo Data

- Data Manipulation
- Transactions and Undo Data
- Undo Data Versus Redo Data
- Configuring Undo Retention

Implementing Oracle Database Auditing

- Describe DBA responsibilities for security
- Enable standard database auditing
- Specify audit options
- Review audit information
- Maintain the audit trail

Administrating User Security

- Database User Accounts
- Predefined Administrative Accounts
- Benefits of Roles
- Predefined Roles
- Implementing Profiles

Performance Management

- Performance Monitoring
- Managing Memory Components
- Enabling Automatic Memory Management (AMM)
- Automatic Shared Memory Advisor
- Using Memory Advisors
- Dynamic Performance Statistics
- Troubleshooting and Tuning Views
- Invalid and Unusable Objects

Backup and Recovery Concepts

- Part of Your Job
- Statement Failure
- User Error
- Understanding Instance Recovery
- Phases of Instance Recovery
- Using the MTTR Advisor
- Media Failure
- Archive Log Files

Performing Database Backups

- Backup Solutions: Overview
- Oracle Secure Backup
- User-Managed Backup
- Terminology
- Recovery Manager (RMAN)
- Configuring Backup Settings
- Backing Up the Control File to a Trace File
- Monitoring the Flash Recovery Area

Performing Database Recovery

- Opening a Database
- Data Recovery Advisor
- Loss of a Control File
- Loss of a Redo Log File
- Data Recovery Advisor
- Data Failures
• Listing Data Failures
• Data Recovery Advisor Views

Moving Data

• Describe ways to move data
• Create and use directory objects
• Use SQL*Loader to move data
• Use external tables to move data
• General architecture of Oracle Data Pump
• Use Data Pump export and import to move data

Working with Support

• Use the Enterprise Manager Support Workbench
• Work with Oracle Support
• Log service requests (SR)
• Manage patches
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- Set up initialization parameter files for ASM instance
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- Using the DBCA to Create a Database
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- Using the DBCA to Delete a Database

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- Data Concurrency
- Enqueue Mechanism
- Resolving Lock Conflicts
- Deadlocks

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- Transactions and Undo Data
- Undo Data Versus Redo Data
- Configuring Undo Retention

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- Describe DBA responsibilities for security
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- Review audit information
- Maintain the audit trail

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- Benefits of Roles
- Predefined Roles
- Implementing Profiles

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- Loss of a Control File
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Database Maintenance

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- Manage the Automatic Workload Repository (AWR)
- Use the Automatic Database Diagnostic Monitor (ADDM)
• Listing Data Failures
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• Describe ways to move data
• Create and use directory objects
• Use SQL*Loader to move data
• Use external tables to move data
• General architecture of Oracle Data Pump
• Use Data Pump export and import to move data

Working with Support

• Use the Enterprise Manager Support Workbench
• Work with Oracle Support
• Log service requests (SR)
• Manage patches
About this Course

This Oracle Database 11g: Administration Workshop II training takes the database administrator beyond the basic tasks covered in the first workshop. You'll begin by gaining a deep understanding of the most important responsibilities a DBA has: performing backup and recovery.

Benefits to You

Ensure fast, reliable, secure and easy to manage performance. Optimize database workloads, lower IT costs and deliver a higher quality of service by enabling smooth and rapid consolidation within your Datacenter.

Course Objectives

- Back and recover a database (and its parts) with RMAN (command-line and Enterprise Manager)
- Use flashback technology to view past states of data and to revert either objects or the entire database back to a past state
- Use an appropriate and flexible memory configuration for your database
- Identify burdensome database sessions and poorly performing SQL
- Configure the Oracle Database for optimal recovery
- Configure the database instance such that resources are appropriately allocated among sessions and tasks
- Schedule jobs to run inside or outside of the database
- Use compression to optimize database storage and duplicate a database

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Technical Administrator
- Support Engineer
- Technical Consultant

Prerequisite

Oracle Introduction to SQL course or equivalent experience

Oracle Database 11G Administration Workshop I
### At Course Completion

After completing this course, students will be able to:

- Diagnose and repair data failures with Flashback technology.
- Manage space to optimize database storage so you can respond to growing space requirements.
- Monitor and manage major database components, including memory, performance and resources.
- Secure the availability of your database through appropriate backup and recovery strategies.
- Automate DBA tasks with the Scheduler.

### Course Outline

#### Core Concepts and Tools of the Oracle Database

- The Oracle Database Architecture: Overview
- ASM Storage Concepts
- Connecting to the Database and the ASM Instance
- DBA Tools Overview

#### Configuring for Recoverability

- Purpose of Backup and Recovery (B&R), Typical Tasks and Terminology
- Using the Recovery Manager (RMAN)
- Configuring your Database for B&R Operations
- Configuring Archivelog Mode
- Configuring Backup Retention
- Configuring and Using a Flash Recovery Area (FRA)

#### Creating Backups with RMAN

- RMAN backup types
- Creating and Using the following:
  - Backup Sets and Image Copies
  - Whole Database Backup
  - Fast Incremental Backup
  - Configure Backup Destinations
  - Duplexed Backup Sets
  - Archival Backups

#### Using the RMAN Recovery Catalog

- Tracking and Storing Backup Information
- Setting up a Recovery Catalog
- Recording Backups
- Using RMAN Stored Scripts
- Managing the Recovery Catalog (Backup, Export, Import, Upgrade, Drop and Virtual Private Catalog)

#### Configuring Backup Settings

- Configuring and Managing Persistent Settings for RMAN

- Configuring Autobackup of Control File
- Backup optimization
- Advanced Configuration Settings: Compressing Backups
- Configuring Backup and Restore for Very Large Files (Multisection)

#### Restore and Recovery Task

- Restoring and Recovering
- Causes of File Loss
- Automatic Tempfile Recovery
- Recovering from the Loss of a Redo Log Group
- Recovering from a Lost Index Tablespace
- Re-creating a Password Authentication File
- Complete and Incomplete Recovery
- Other Recovery Operations

#### Using RMAN to Perform Recovery

- Complete Recovery after Loss of a Critical or Noncritical Data File
• Recovering Image Copies and Switching Files
• Restore and Recovery of a Database in NOARCHIVELOG Mode
• Incomplete Recovery
• Performing Recovery with a Backup Control File
• Restoring from Autobackup: Server Parameter File and Control File
• Restoring and Recovering the Database on a New Host

Monitoring and Tuning RMAN

• Monitoring RMAN Jobs
• Balance Between Speed of Backup Versus Speed of Recovery
• RMAN Multiplexing
• Synchronous and Asynchronous I/O
• Explaining Performance Impact of MAXPIECESIZE, FILESPERSET, MAXOPENFILES and BACKUP DURATION

Diagnosing the Database

• Data Recovery Advisor (DRA)
• Block Corruption
• Automatic Diagnostic Repository (ADR)
• Health Monitor
• The ADR Command-Line Tool, ADRCI

Using Flashback Technology I

• Flashback Technology: Overview and Setup
• Using Flashback Technology to Query Data
• Flashback Table
• Flashback Transaction Query
• Performing Flashback Transaction Backout

Using Flashback Technology II

• Oracle Total Recall
• Flashback Drop and the Recycle Bin

Performing Flashback Database

• Configuring Flashback Database
• Performing Flashback Database Operations
• Monitoring Flashback Database

Managing Memory

• Oracle Memory Structures
• Oracle Database Memory Parameters
• Using Automatic Memory Management
• Automatic Shared Memory Management
• Using Memory Advisors
• Using Data Dictionary Views

Managing Database Performance

• Tuning Activities
• Using Statistic Preferences
• Optimizer Statistics Collection
• Monitor the Performance of Sessions and Services
• Automatic Workload Repository (AWR)
• Describing the Benefits of Database Replay

Managing Performance by SQL Tuning

• SQL Tuning and SQL Advisors
• Using SQL Tuning Advisor
• SQL Access Advisor
• SQL Performance Analyzer Overview

Managing Resources

• Database Resource Manager: Overview and Concepts
• Accessing and Creating Resource Plans
• Creating Consumer Group
• Specifying Resource Plan Directives, including:
  - Limiting CPU Utilization at the Database Level
  - Instance Caging
• Activating a Resource Plan
• Monitoring the Resource Manager

Automating Tasks with the Scheduler

• Simplifying Management Tasks
• Creating a Job, Program, and Schedule
• Using Time-Based, Event-Based, and Complex Schedules
• Describing the Use of Windows, Window Groups, Job Classes, and Consumer Groups
• Multi-Destination Jobs

Managing Space in Blocks

• Free Space Management
• Monitoring Space
• Compressing Data

Managing Space in Segments

• Segment Creation on Demand
• Additional Automatic Space-Saving Functionality
• Shrinking Segments
• Segment Advisor
• Managing Resumable Space Allocation

Managing Space for the Database

• Using 4 KB-Sector Disks
• Transporting Tablespaces
• Transporting Databases

Duplicating a Database

• Purpose and Methods of Cloning a Database
• Using RMAN to Create a Duplicate Database
• Cloning a Database from a Backup
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- Using 4 KB-Sector Disks
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- Purpose and Methods of Cloning a Database
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- Targetless Duplicating a Database
Toad for Oracle
Course#: ORCL-11053

Length: 5 Days
Audience: Database Administrators, Developers
Type: Course
Delivery Method: Instructor-Led (Classroom)

About this Course

This course offers students an introduction to Oracle Database 11g database technology. In this class students learn the concepts of relational databases and the SQL programming language. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, create database objects, and query meta data.

In addition, the advanced features of SQL needed to query and manipulate data within the database are taught. Schema objects that are useful for data warehousing and other application areas are discussed in detail. Students learn about manipulating large data sets and storing and retrieving dates according to different time zones.

Audience Profile

This course is designed for the following audiences:

- Database Administrators
- Forms Developers
- Portal Developers
- Business Intelligence Developers
- End Users
- Application Developers
- PL/SQL Developers

At Course Completion

After completing this course students will be able to:

- Retrieve row and column data from tables with the SELECT statement.
- Employ SQL functions to generate and retrieve customized data.
- Run data manipulation statements (DML) to update data in the Oracle Database 11g.
- Control user access and manage schema objects
- Search data using advanced sub queries

Prerequisites

Before attending this course, students must have:

- Familiarity with data processing concepts and techniques.
- Ability to use a graphical user interface (GUI).

Course Outline
Introducing Oracle Database 11g
• List the features of Oracle Database 11g
• Discuss the basic design, theoretical and physical aspects of a relational database
• Categorize the different types of SQL statements
• Describe the data set used by the course
• Log onto the database using the SQL Developer environment
• Save queries to files and use script files in SQL Developer

Retrieving Data Using the SQL SELECT Statement
• List the capabilities of SQL SELECT statements
• Generate a report of data from the output of a basic SELECT statement
• Select All Columns
• Select Specific Columns
• Use Column Heading Defaults
• Use Arithmetic Operators
• Understand Operator Precedence
• Learn the DESCRIBE command to display the table structure

Restricting and Sorting Data
• Write queries that contain a WHERE clause to limit the output retrieved
• List the comparison operators and logical operators that are used in a WHERE clause
• Describe the rules of precedence for comparison and logical operators
• Use character string literals in the WHERE clause
• Write queries that contain an ORDER BY clause sort the output of a SELECT statement
• Sort output in descending and ascending order

Using Single-Row Functions to Customize Output
• Describe the differences between single row and multiple row functions
• Manipulate strings with character function in the SELECT and WHERE clauses

• Manipulate numbers with the ROUND, TRUNC and MOD functions
• Perform arithmetic with date data
• Manipulate dates with the date functions

Using Conversion Functions and Conditional Expressions
• Describe implicit and explicit data type conversion
• Use the TO_CHAR, TO_NUMBER, and TO_DATE conversion functions
• Nest multiple functions
• Apply the NVL, NULLIF, and COALESCE functions to data
• Use conditional IF THEN ELSE logic in a SELECT statement

Reporting Aggregated Data Using the Group Functions
• Use the aggregation functions in SELECT statements to produce meaningful reports
• Create queries that divide the data in groups by using the GROUP BY clause
• Create queries that exclude groups of date by using the HAVING clause

Displaying Data From Multiple Tables
• Write SELECT statements to access data from more than one table
• View data that generally does not meet a join condition by using outer joins
• Join a table by using a self join

Using Sub-queries to Solve Queries
• Describe the types of problem that sub-queries can solve
• Define sub-queries
• List the types of sub-queries
• Write single-row and multiple-row sub-queries

Using the SET Operators
• Describe the SET operators
• Use a SET operator to combine multiple queries into a single query
• Control the order of rows returned when using the SET operators

Manipulating Data
• Describe each DML statement
• Insert rows into a table with the INSERT statement
• Use the UPDATE statement to change rows in a table
• Delete rows from a table with the DELETE statement
• Save and discard changes with the COMMIT and ROLLBACK statements
• Explain read consistency
• Using DDL Statements to Create and Manage Tables
  • Categorize the main database objects
  • Review the table structure
  • List the data types available for columns
  • Create a simple table
  • Decipher how constraints can be created at table creation
  • Describe how schema objects work

Creating Other Schema Objects
• Create a simple and complex view
• Retrieve data from views
• Create, maintain, and use sequences
• Create and maintain indexes
• Create private and public synonyms

Controlling User Access
• Differentiate system privileges from object privileges
• Grant privileges on tables
• View privileges in the data dictionary
• Grant roles
• Distinguish between privileges and roles

Managing Schema Objects
• Add constraints
• Create indexes
• Create indexes using the CREATE TABLE statement
• Create function-based indexes
• Drop columns and set column UNUSED
• Perform FLASHBACK operations
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Managing Objects with Data Dictionary Views
• Explain the data dictionary
• Find table information
• Report on column information
• View constraint information
• Find view information
• Verify sequence information
• Understand synonyms
• Add comments

Managing Large Data Sets
• Manipulate data using sub-queries
• Describe the features of multi-table inserts
• Use the different types of multi-table inserts
• Merge rows in a table
• Track the changes to data over a period of time

Managing Data in Different Time Zones
• Use data types similar to DATE that store fractional seconds and track time zones
• Use data types that store the difference between two date-time values
• Practice using the multiple data-time functions for globalize applications

Retrieving Data Using Sub-queries
• Write a multiple-column sub-query
• Use scalar sub-queries in SQL
• Solve problems with correlated sub-queries
• Update and delete rows using correlated sub-queries
• Use the EXISTS and NOT EXISTS operators
• Use the WITH clause

Regular Expression Support
• List the benefits of using regular expressions
• Use regular expressions to search for, match, and replace strings
Oracle Database 11g: Introduction to SQL

Course#: ORCL-1101
Exams: 1Z0-051

Length: Evenings - 4 Weeks
Audience: Database Administrators, Developers
Type: Course
Delivery Method: Instructor-Led (Classroom)

About this Course

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Project Management Essentials

Course Specifications

Course length: 3.0 day(s)

Course Description

Course Objective: You will identify and apply generally recognized practices in project management.

Target Student: The target student for this course is any individual who may need to perform project management activities in their job role on either a formal or informal basis, or any project team members who want to enhance their knowledge of project management in order to interact more productively with a project manager and perform more effectively on a project team.

Prerequisites: Basic working knowledge of office productivity tools is required.

Course Objectives

Upon successful completion of this course, students will be able to:

- identify the basic concepts and terminology of professional project management.
- launch a project.
- estimate project work.
- create a project schedule.
- plan project costs.
- plan for project risks.
- plan for project quality and compliance.
- manage human resources for your project.
- manage project procurements.
- plan for change management and monitor the project scope.
- monitor and optimize project schedule and cost.
- monitor quality of project work and the risks involved.
- plan communication strategies and manage stakeholder relationships.
- perform project closure.

Course Content

Lesson 1: Getting Started with Project Management

Topic 1A: Project Management Basics
Topic 1B: Factors Influencing a Project

Lesson 2: Launching Projects

Topic 2A: How Organizations Choose the Right Project
Topic 2B: Identify Project Stakeholders and Their Expectations
Topic 2C: Identify the Project Scope
Topic 2D: Prepare a SOW
Topic 2E: Formally Authorize a Project

Lesson 3: Estimating Project Work
Topic 3A: Estimate Project Effort and Resources Using Top-Down Estimation
Topic 3B: Estimate Project Effort and Resources Using Bottom-Up Estimation
Topic 3C: Reduce Risks in Project Estimates

Lesson 4: Creating a Project Schedule

Topic 4A: Illustrate Project Flow
Topic 4B: Identify Activity Resources
Topic 4C: Schedule Project Work

Lesson 5: Planning Project Costs

Topic 5A: Estimate Project Costs
Topic 5B: Establish the Cost Baseline
Topic 5C: Reconcile Funding and Costs

Lesson 6: Planning for Risks

Topic 6A: Create a Risk Management Plan
Topic 6B: Identify Risks and Their Causes
Topic 6C: Analyze Risks
Topic 6D: Develop a Risk Response Plan

Lesson 7: Planning for Quality and Compliance

Topic 7A: Deliver the Desired Project Results
Topic 7B: Verify Compliance Requirements

Lesson 8: Managing Human Resources

Topic 8A: Plan Your Dream Team
Topic 8B: Put the Team Together
Topic 8C: Build the Team
Topic 8D: Manage the Team

Lesson 9: Managing Project Procurements

Topic 9A: Plan for Project Procurements
Topic 9B: Obtain Responses from Vendors
Topic 9C: Choose the Right Vendor
Topic 9D: Manage Vendors and Procurements

Lesson 10: Managing Change During Project Execution

Topic 10A: Gear Up for Project Execution
Topic 10B: Manage Project Changes
Topic 10C: Monitor the Project Scope

Lesson 11: Monitoring and Controlling Project Schedule and Cost

Topic 11A: Monitor and Control the Project Schedule
Topic 11B: Optimize the Project Schedule
Topic 11C: Monitor and Control Project Costs

Lesson 12: Monitoring Risk and Quality

Topic 12A: Monitor and Control Risks
Topic 12B: Put Quality Plans into Action
Topic 12C: Control Project Quality

Lesson 13: Communicating and Reporting

Topic 13A: Communicate in a Project
Topic 13B: Distribute Project Information
Topic 13C: Manage Stakeholder Relationships and Expectations
Topic 13D: Report on Project Performance
Lesson 14: Closing the Project

**Topic 14A:** Hand Off the Project  
**Topic 14B:** Close Project Procurements  
**Topic 14C:** Wrap Up a Project

Appendix A: Project Management Templates
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- **Topic 2C:** Identify the Project Scope
- **Topic 2D:** Prepare a SOW
- **Topic 2E:** Formally Authorize a Project

**Lesson 3: Estimating Project Work**

- **Topic 3A:** Estimate Project Effort and Resources Using Top-Down Estimation
- **Topic 3B:** Estimate Project Effort and Resources Using Bottom-Up Estimation
- **Topic 3C:** Reduce Risks in Project Estimates

**Lesson 4: Creating a Project Schedule**

- **Topic 4A:** Illustrate Project Flow
- **Topic 4B:** Identify Activity Resources
- **Topic 4C:** Schedule Project Work

**Lesson 5: Planning Project Costs**

- **Topic 5A:** Estimate Project Costs
- **Topic 5B:** Establish the Cost Baseline
- **Topic 5C:** Reconcile Funding and Costs

**Lesson 6: Planning for Risks**

- **Topic 6A:** Create a Risk Management Plan
- **Topic 6B:** Identify Risks and Their Causes
- **Topic 6C:** Analyze Risks
- **Topic 6D:** Develop a Risk Response Plan

**Lesson 7: Planning for Quality and Compliance**

- **Topic 7A:** Deliver the Desired Project Results
- **Topic 7B:** Verify Compliance Requirements

**Lesson 8: Managing Human Resources**

- **Topic 8A:** Plan Your Dream Team
- **Topic 8B:** Put the Team Together
- **Topic 8C:** Build the Team
- **Topic 8D:** Manage the Team

**Lesson 9: Managing Project Procurements**

- **Topic 9A:** Plan for Project Procurements
- **Topic 9B:** Obtain Responses from Vendors
- **Topic 9C:** Choose the Right Vendor
- **Topic 9D:** Manage Vendors and Procurements

**Lesson 10: Managing Change During Project Execution**

- **Topic 10A:** Gear Up for Project Execution
- **Topic 10B:** Manage Project Changes
- **Topic 10C:** Monitor the Project Scope
Lesson 11: Monitoring and Controlling Project Schedule and Cost

Topic 11A: Monitor and Control the Project Schedule
Topic 11B: Optimize the Project Schedule
Topic 11C: Monitor and Control Project Costs

Lesson 13: Communicating and Reporting

Topic 13A: Communicate in a Project
Topic 13B: Distribute Project Information
Topic 13C: Manage Stakeholder Relationships and Expectations
Topic 13D: Report on Project Performance

Lesson 12: Monitoring Risk and Quality

Topic 12A: Monitor and Control Risks
Topic 12B: Put Quality Plans into Action
Topic 12C: Control Project Quality

Lesson 14: Closing the Project

Topic 14A: Hand off the Project
Topic 14B: Close Project Procurements
Topic 14C: Wrap Up a Project
Project Management Professional (PMP)

About this Course

This course is designed for persons who have on the job experience performing project management tasks, whether or not project manager is their formal job role, who are not certified project management professionals, and who might or might not have received formal project management training. The course is appropriate for these persons if they wish to develop professionally, increase their project management skills, apply a formalized and standards-based approach to project management as well as seeking career advancement by moving into a formal project manager job role.

At the course completion

Upon successful completion of this course, students will be able to:

- Describe professional project management.
- Initiate a project.
- Plan project work.
- Develop project schedules.
- Develop cost estimates and budgets.
- Plan project quality, staffing, and communications.
- Analyze risks and plan risk responses.
- Plan project procurements.
- Execute project work.
- Manage project procurement.
- Monitor and control project work.
- Monitor and control project schedule and costs.
- Monitor and control project performance and quality.
- Monitor and control project risks and procurements.
- Close the project.

Prerequisites

Familiarity with project management concepts and some working experience with project management are required. Experience with a specific project management software tool is not required.

- Microsoft Word Level 1 is required.
- Project Management Fundamentals is recommended.
Lesson 1: Examining Professional Project Management
- Identify Project Management Processes
- Identify Professional and Social Responsibilities
- Identify the Interpersonal Skills Required for a Project Manager

Lesson 2: Initiating a Project
- Examine the Project Management Context
- Examine Project Selection
- Prepare a Project Statement of Work
- Create a Project Charter
- Identify Project Stakeholders

Lesson 3: Planning Project Work
- Identify the Elements of a Project Management Plan
- Document Stakeholder Requirements
- Create a Scope Statement
- Develop a Work Breakdown Structure

Lesson 4: Developing Project Schedules
- Create an Activity List
- Create a Project Schedule Network Diagram
- Estimate Activity Resources
- Estimate Duration for Project Activities
- Develop a Project Schedule
- Identify the Critical Path
- Optimize the Project Schedule
- Establish a Schedule Baseline

Lesson 5: Developing Cost Estimates and Budgets
- Estimate Project Costs
- Estimate the Cost Baseline
- Reconcile Funding and Costs

Lesson 6: Planning Project Quality, Staffing, and Communications
- Create a Quality Management Plan
- Document the Project Roles, Responsibilities, and Reporting Relationships
- Create a Communications Management Plan

Lesson 7: Analyzing Risks and Planning Risk Responses
- Examine a Risk Management Plan
- Identify Project Risks and Triggers
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Develop a Risk Response Plan

Lesson 8: Planning Project Procurements
- Plan Project Procurements
- Prepare a Procurement Statement of Work
- Prepare a Procurement Document

Lesson 9: Executing Project Work
- Identify the Direct and Manage Project Execution Process
- Execute a Quality Assurance Plan
- Acquire the Project Team
- Develop the Project Team
- Manage the Project Team
- Distribute Project Information
- Manage Stakeholder Relationships and Expectations

Lesson 10: Managing Project Procurement
- Examine the Conduct Procurements Process
- Obtain Responses from Sellers
- Determine Project Sellers

Lesson 11: Monitoring and Controlling Project Work
- Identify the Monitor and Control Project Work Process
- Develop an Integrated Change Control System
- Utilize the Integrated Change Control System
- Review Deliverables and Work Results
- Control the Project Scope

Lesson 12: Monitoring and Controlling Project Schedule and Costs
- Control the Project Schedule
- Control Project Costs

Lesson 13: Monitoring and Controlling Project Performance and Quality
- Perform Quality Control
- Report on Project Performance

Lesson 14: Monitoring and Controlling Project Risks and Procurements
- Monitor and Control Project Risks
- Administer Project Procurements
Lesson 15: Closing the Project

- Close Project Procurements
- Close the Project or Phase Administratively
This cutting-edge course teaches you how SIP provides a highly-scalable and cost-effective way to offer new and exciting telecommunication feature sets, helping you design your “next generation” network and develop new applications and software stacks. Other key topics include SIP as a key component in the Internet multimedia conferencing architecture, request and response messages, devices in a typical network, types of servers, SIP headers, comparisons with existing signaling protocols including H.323, related protocols SDP (Session Description Protocol) and RTP (Real-time Transport Protocol), and the future direction of SIP.

1 SIP and the Internet

1.1 Signaling Protocols
1.2 Internet Multimedia Protocol Stack
  1.2.1 Physical Layer
  1.2.2 Data/Link Layer
  1.2.3 Network Layer
  1.2.4 Transport Layer
  1.2.5 Application Layer
  1.2.6 Utility Applications
  1.2.7 Multicast
1.3 Internet Names
1.4 URLs, URIs, and URNs
1.5 Domain Name Service
  1.5.1 DNS Resource Records
  1.5.2 Address Resource Records (A or AAAA)
  1.5.3 Service Resource Records (SRV)
  1.5.4 Naming Authority Pointer Resource Records (NAPTR)
  1.5.5 DNS Resolvers
1.6 Global Open Standards
1.7 Internet Standards Process
1.8 A Brief History of SIP
1.9 Conclusion

2 Introduction to SIP
2.1 A Simple Session Establishment Example
2.2 SIP Call with a Proxy Server
2.3 SIP Registration Example
2.4 SIP Presence and Instant Message Example
2.5 Message Transport
2.5.1 UDP Transport
2.5.2 TCP Transport
2.5.3 TLS Transport
2.5.4 SCTP Transport
2.6 Transport Protocol Selection
2.7 Conclusion

3 SIP Clients and Servers
3.1 SIP User Agents
3.2 Presence Agents
3.3 Back-to-Back User Agents
3.4 SIP Gateways
3.5 SIP Servers
3.5.1 Proxy Servers
3.5.2 Redirect Servers
3.5.3 Registrar Servers
3.6 Uniform Resource Indicators
3.7 Acknowledgment of Messages
3.8 Reliability
3.9 Multicast Support
3.10 Conclusion

4 SIP Request Messages
4.1 Methods
4.1.1 INVITE
4.1.2 REGISTER
4.1.3 BYE
4.1.4 ACK
4.1.5 CANCEL
4.1.6 OPTIONS
4.1.7 SUBSCRIBE
4.1.8 NOTIFY
4.1.9 PUBLISH
4.1.10 REFER
4.1.11 MESSAGE
4.1.12 INFO
4.1.13 PRACK
4.1.14 UPDATE

4.2 URI and URL Schemes Used by SIP
4.2.1 SIP and SIPS URIs
4.2.2 Telephone URLs
4.2.3 Presence and Instant Messaging URLs

4.3 Tags
4.4 Message Bodies
4.5 Conclusion

5 SIP Response Messages
5.1 Informational
5.1.1 100 Trying
5.1.2 180 Ringing

x SIP: Understanding the Session Initiation Protocol
5.1.3 181 Call is Being Forwarded
5.1.4 182 Call Queued
5.1.5 183 Session Progress

5.2 Success
5.2.1 200 OK
5.2.2 202 Accepted
5.2.3 204 No Notification

5.3 Redirection
5.3.1 300 Multiple Choices
5.3.2 301 Moved Permanently
5.3.3 302 Moved Temporarily
5.3.4 305 Use Proxy
5.3.5 380 Alternative Service

5.4 Client Error
5.4.1 400 Bad Request
5.4.2 401 Unauthorized
5.4.3 402 Payment Required
5.4.4 403 Forbidden
5.4.5 404 Not Found
5.4.6 405 Method Not Allowed
5.4.7 406 Not Acceptable
5.4.8 407 Proxy Authentication Required
5.4.9 408 Request Timeout
5.4.10 409 Conflict
5.4.11 410 Gone
5.4.12 411 Length Required
5.4.13 412 Conditional Request Failed
5.4.14 413 Request Entity Too Large
5.4.15 414 Request-URI Too Long
5.4.16 415 Unsupported Media Type
5.4.17 416 Unsupported URI Scheme
5.4.18 417 Unknown Resource Priority
5.4.19 420 Bad Extension
5.4.20 421 Extension Required
5.4.21 422 Session Timer Interval Too Small
5.4.22 423 Interval Too Brief
5.4.23 428 Use Identity Header
5.4.24 429 Provide Referer Identity
5.4.25 430 Flow Failed
5.4.26 433 Anonymity Disallowed
5.4.27 436 Bad Identity-Info Header
5.4.28 437 Unsupported Certificate
5.4.29 438 Invalid Identity Header
5.4.30 439 First Hop Lacks Outbound Support
5.4.31 440 Max-Breadth Exceeded
5.4.32 470 Consent Needed
5.4.33 480 Temporarily Unavailable
5.4.34 481 Dialog/Transaction Does Not Exist
5.4.35 482 Loop Detected
5.4.36 483 Too Many Hops
5.4.37 484 Address Incomplete
5.4.38 485 Ambiguous
5.4.39 486 Busy Here
5.4.40 487 Request Terminated
5.4.41 488 Not Acceptable Here
5.4.42 489 Bad Event
5.4.43 491 Request Pending
5.4.44 493 Request Undecipherable
5.4.45 494 Security Agreement Required
5.5 Server Error
5.5.1 500 Server Internal Error
5.5.2 501 Not Implemented
5.5.3 502 Bad Gateway
5.5.4 503 Service Unavailable
5.5.5 504 Gateway Timeout
5.5.6 505 Version Not Supported
5.5.7 513 Message Too Large
5.5.8 580 Preconditions Failure
5.6 Global Error
5.6.1 600 Busy Everywhere
5.6.2 603 Decline
5.6.3 604 Does Not Exist Anywhere
xii SIP: Understanding the Session Initiation Protocol
5.6.4 606 Not Acceptable
5.7 Questions

6 SIP Header Fields
6.1 Request and Response Header Fields
6.1.1 Accept
6.1.2 Accept-Encoding
6.1.3 Accept-Language
6.1.4 Alert-Info
6.1.5 Allow
6.1.6 Allow-Events
6.1.7 Answer-Mode
6.1.8 Call-ID
6.1.9 Contact
6.1.10 CSeq
6.1.11 Date
6.1.12 Encryption
6.1.13 Expires
6.1.14 From
6.1.15 History Info
6.1.16 Organization
6.1.17 Path
6.1.18 Priv-Answer-Mode
6.1.19 Record-Route
6.1.20 Recv-Info
6.1.21 Refer-Sub
6.1.22 Retry-After
6.1.23 Subject
6.1.24 Supported
6.1.25 Timestamp
6.1.26 To
6.1.27 User-Agent
6.1.28 Via
6.2 Request Header Fields
6.2.1 Accept-Contact
6.2.2 Authorization
6.2.3 Call-Info
6.2.4 Event
6.2.5 Hide
6.2.6 Identity
6.2.7 Identity-Info
6.2.8 In-Reply-To
6.2.9 Info-Package
6.2.10 Join
6.2.11 Priority
6.2.12 Privacy
6.2.13 Proxy-Authorization
6.2.14 Proxy-Require
6.2.15 P-OSP-Auth-Token
6.2.16 P-Asserted-Identity
6.2.17 P-Preferred-Identity
6.2.18 Max-Breadth
6.2.19 Max-Forwards
6.2.20 Reason
6.2.21 Refer-To
6.2.22 Referred-By
6.2.23 Reply-To
6.2.24 Replaces
6.2.25 Reject-Contact
6.2.26 Request-Disposition
6.2.27 Require
6.2.28 Resource-Priority
6.2.29 Response-Key
6.2.30 Route
6.2.31 RACK
6.2.32 Security-Client
6.2.33 Security-Verify
6.2.34 Session-Expires
6.2.35 SIP-If-Match
6.2.36 Subscription-State
6.2.37 Suppress-If-Match
6.2.38 Target-Dialog
SIP: Understanding the Session Initiation Protocol
6.2.39 Trigger-Consent
6.3 Response Header Fields
6.3.1 Accept-Resource-Priority
6.3.2 Authentication-Info
6.3.3 Error-Info
6.3.4 Flow-Timer
6.3.5 Min-Expires
6.3.6 Min-SE
6.3.7 Permission-Missing
6.3.8 Proxy-Authenticate
6.3.9 Security-Server
6.3.10 Server
6.3.11 Service-Route
6.3.12 SIP-ETag
6.3.13 Unsupported
6.3.14 Warning
6.3.15 WWW-Authenticate
6.3.16 RSeq
6.4 Message Body Header Fields
6.4.1 Content-Encoding
6.4.2 Content-Disposition
6.4.3 Content-Language
6.4.4 Content-Length
6.4.5 Content-Type
6.4.6 MIME-Version

7 Wireless, Mobility, and IMS
7.1 IP Mobility
7.2 SIP Mobility
7.3 IMS and SIP
7.4 IMS Header Fields
7.5 Conclusion

8 Presence and Instant Messaging
8.1 Introduction
8.2 History of IM and Presence
8.3 SIMPLE
8.4 Presence with SIMPLE
8.4.1 SIP Events Framework
8.4.2 Presence Bodies
8.4.3 Resource Lists
8.4.4 Filtering
8.4.5 Conditional Event Notifications and ETags
8.4.6 Partial Publication
8.4.7 Presence Documents Summary
8.5 Instant Messaging with SIMPLE
8.5.1 Page Mode Instant Messaging
8.5.2 Common Profile for Instant Messaging
8.5.3 Instant Messaging Delivery Notification
8.5.4 Message Composition Indication
8.5.5 Multiple Recipient Messages
8.5.6 Session Mode Instant Messaging
8.6 Jabber
8.6.1 Standardization as Extensible Messaging and Presence Protocol
8.6.2 Interworking with SIMPLE
8.6.3 Jingle
8.6.4 Future Standardization of XMPP
8.7 Conclusion

9 Services in SIP
9.1 Gateway Services
9.2 SIP Trunking
9.3 SIP Service Examples
9.4 Voicemail
9.5 SIP Video

xvi SIP: Understanding the Session Initiation Protocol
9.6 Facsimile
9.7 Conferencing
9.7.1 Focus
9.7.2 Mixer
9.7.3 Non-SIP Conference Control
9.8 Application Sequencing
9.9 Other SIP Service Architectures
9.9.1 Service Oriented Architecture
9.9.2 Servlets
9.9.3 Service Delivery Platform
9.10 Conclusion

10 Network Address Translation
10.1 Introduction to NAT
10.2 Advantages of NAT
10.3 Disadvantages of NAT
10.4 How NAT Works
10.5 Types of NAT
10.5.1 Endpoint Independent Mapping NAT
10.5.2 Address Dependent Mapping NAT
10.5.3 Address and Port Dependent Mapping NAT
10.5.4 Hairpinning Support
10.5.5 IP Address Pooling Options
10.5.6 Port Assignment Options
10.5.7 Mapping Refresh
10.5.8 Filtering Modes
10.6 NAT Mapping Examples
10.7 NATs and SIP
10.8 Properties of a Friendly NAT or How a NAT Should BEHAVE
10.9 STUN Protocol
10.10 UNSAF Requirements
10.11 SIP Problems with NAT
10.11.1 Symmetric SIP
10.11.2 Connection Reuse
10.11.3 SIP Outbound
10.12 Media NAT Traversal Solutions
10.12.1 Symmetric RTP
10.12.2 RTCP Attribute
10.12.3 Self-Fixing Approach
10.13 Hole Punching
10.14 TURN: Traversal Using Relays Around NAT
10.15 ICE: Interactive Connectivity Establishment
10.16 Conclusion

11 Related Protocols
11.1 PSTN Protocols
11.1.1 Circuit Associated Signaling
11.1.2 ISDN Signaling
11.1.3 ISUP Signaling
11.2 SIP for Telephones
11.3 Media Gateway Control Protocols
11.4 H.323
11.4.1 Introduction to H.323
11.4.2 Example of H.323
11.4.3 Versions

12 Media Transport
12.1 Real-Time Transport Protocol (RTP)
12.2 RTP Control Protocol (RTCP)
12.2.1 RTCP Reports
12.2.2 RTCP Extended Reports
12.3 Compression
12.4 RTP Audio Video Profiles
12.4.1 Audio Codecs
Understanding the Session Initiation Protocol
12.4.2 Video Codecs
12.5 Conferencing
12.6 ToIP—Conversational Text
12.7 DTMF Transport

13 Negotiating Media Sessions
13.1 Session Description Protocol (SDP)
13.1.1 Protocol Version 291
13.1.2 Origin
13.1.3 Session Name and Information
13.1.4 URI
13.1.5 E-Mail Address and Phone Number
13.1.6 Connection Data
13.1.7 Bandwidth
13.1.8 Time, Repeat Times, and Time Zones
13.1.9 Encryption Keys
13.1.10 Media Announcements
13.1.11 Attributes
13.2 SDP Extensions
13.3 The Offer Answer Model
13.3.1 Rules for Generating an Offer
13.3.2 Rules for Generating an Answer
13.3.3 Rules for Modifying a Session
13.3.4 Special Case—Call Hold
13.4 Static and Dynamic Payloads
13.5 SIP Off er Answer Exchanges
13.6 Conclusion
13.7 Questions

14 SIP Security
14.1 Basic Security Concepts
14.1.1 Encryption
14.1.2 Public Key Cryptography
14.1.3 Diffie-Hellman Cryptography
14.1.4 Message Authentication
14.1.5 Digital Certificates
14.2 Threats
14.3 Security Protocols
14.3.1 IPSec
14.3.2 TLS
14.3.3 DNSSec
14.3.4 Secure MIME
14.4 SIP Security Model
14.4.1 SIP Digest Authentication
14.4.2 SIP Authentication Using TLS
14.4.3 Secure SIP
14.4.4 Identity
14.4.5 Enhanced SIP Identity
14.5 SIP Certificate Service
14.6 Media Security
14.6.1 Non-RTP Media
14.6.2 Secure RTP
14.6.3 Keying SRTP
14.6.4 Best Eff ort Encryption
14.6.5 ZRTP
14.7 Questions

15 Peer-to-Peer SIP
15.1 P2P Properties
15.2 P2P Properties of SIP
15.3 P2P Overlays
15.4 RELOAD
15.5 Host Identity Protocol
15.6 Conclusion

16 Call Flow Examples
16.1 SIP Call with Authentication, Proxies, and Record-Route
16.2 SIP Call with Stateless and Stateful Proxies with Called Party Busy
16.3 SIP to PSTN Call through Gateways
16.4 PSTN to SIP Call through a Gateway
16.5 Parallel Search
16.6 Call Setup with Two Proxies
16.7 SIP Presence and Instant Message Example

17 Future Directions
17.1 Bug Fixes and Clarifications
17.2 More Extensions
17.3 Better Identity
17.4 Interdomain SIP
17.5 Making Features Work Better
17.6 Emergency Calling
17.7 More SIP Trunking
17.8 P2P and HIP
17.9 Improved NAT Traversal
17.10 Security Deployment
17.11 Better Interoperability
TOGAF 9.1 Combined Level 1 & 2 Certification Course

Length: 4 Days
Audience: All Professionals
Level: 1 & 2
Delivery Method: Instructor-led Classroom

About this Course

This course covers the latest TOGAF version, which is a part of the leading Open Group Enterprise Architecture standard. This course is independent of the vertical you work for: bank, manufacturer, retailer, aerospace, and government agency. There is a high demand in today's market for Enterprise Architecture professionals. Join the 25,000+ certified TOGAF® professionals group.

This intensive course covers the entire syllabus for the TOGAF® 9.1 Foundation (Level 1) and Certified (Level 2) levels, preparing candidates for the TOGAF® 9.1 Level 1 and Level 2 examinations. The course is enhanced with case studies that demonstrate how TOGAF is applied in real organizations. Sample questions and answers for Level 1 and Level 2 examinations are given throughout the course to help better prepare students for their TOGAF 9.1 exams.

Prerequisite

There are no prerequisites for the course.

Target Audience

- Enterprise Architects
- Business Architects
- IT Architects
- Information Architects
- Technology Architects
- Application Architects
- System Integrators
- Solution Architects
- Data Architects
- Infrastructure Architects
- Security Architects and Technology Vendors.
- It would also benefit CIOs and CTOs, application portfolio managers, I.T. strategists, senior business analysts, Program Managers, Project Managers, Business Analysts, and others responsible for change programs.

At Course Completion

At the end of this course, you will learn:

- The logic of value-creation within the context of the ITIL Service Lifecycle
- Strategic assets of an organization and their performance potential for serving particular customers or market spaces (internal or external)
- Formal definitions of services suitable for planning and execution across the Service Lifecycle
- Service valuation, demand modeling, service provisioning and analysis, and business impact analysis
- Service Portfolio Management, methods, and processes related to service management and services
- High-level strategies for demand management that can be supported by capabilities across the Service Lifecycle
- How Service Strategy is driven through and informed by other elements of the Service Lifecycle
Course Outline

Architecture Development Method:

• Preliminary Phase

• Phase A – Architecture Vision

• Phase B – Business Architecture

• Phase C – Information Systems Architectures- Overview

• Phase C – Data Architecture

• Phase C – Application Architecture

• Phase D – Technology Architecture

• Phase E – Opportunities and Solutions

• Phase F – Migration Planning

• Phase G – Implementation Governance

• Phase H – Architecture Change Management

• Architecture Requirements Management

• Architecture Partitioning

• Adapting the ADM – Iteration and Levels

• Stakeholder Management

• Architecture Content Framework

• Architecture Benchmarking and Knowledge/Content Management

• Architecture Capability Framework
VMware vSphere V6.0

About this Course

This powerful 5-day class is an intensive introduction to VMware vSphere including VMware 6.0 and vCenter. Assuming no prior virtualization experience, this class starts with the basics and rapidly progresses to advanced topics. With hands-on labs, students learn the skills they need to become effective vSphere administrators.

Labs start with installation and configuration of stand-alone servers and progress to shared storage, networking and centralized management. The class continues to advanced topics including resource balancing, high availability, power management, back up and recovery, performance, vCenter redundancy, VM redundancy. Disaster recovery, rapid deployment, hot migration and workload consolidation are also covered.

This class is unique in its approach; which is to identify and eliminate common IT pain points using vSphere. By the end of the class, attendees will have learned the skills, and best practices of virtualization. Attendees will be able to design, implement, deploy, configure, monitor, manage and troubleshoot vSphere 6.0.

Who Should Attend

This class is suitable for anyone who wants to learn how to extract the maximum benefit from their investment in Virtual Infrastructure, including:

- **System architects** or others who need to design virtual infrastructure
- **Security specialists** responsible for administering, managing, securing Virtual Infrastructure
- **Operators** responsible for day-to-day operation of Virtual Infrastructure
- **Performance analysts** who need to understand, provision, monitor Virtual Infrastructure
- **Business Continuity specialists** responsible for disaster recovery and high availability
- **Storage administrators** who work with Fibre / iSCSI SAN volumes and NAS datastores
- **Managers** who need an unbiased understanding of virtualization before committing their organization to a virtual infrastructure deployment.

Prerequisites

Attendees should have user, operator or administrator experience on common operating systems such as Microsoft Windows®, Linux™, UNIX™, etc. Experience installing, configuring and managing operating systems, storage systems and or networks is useful but not required. We assume that all attendees have a basic familiarity with PC server hardware, disk partitioning, IP addressing, O/S installation, networking, etc.

Course Objectives

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ATG Learning
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At the end of the course, attendees will be able to:

- Explain the many significant benefits of virtualization
- Install ESXi Server according to best practices
- Configure and manage local storage
- Create virtual, distributed virtual, and virtual to physical LAN segments
- Understand and use shared SAN storage including Fibre SAN, iSCSI SAN
- Define and use file share (NAS) datastores
- Install, configure and update the Platform Service Controller and vCenter Server Appliance
- Create and use Content Libraries to manage ISO repositories
- Create virtual machines, install operating systems and applications
- Configure and use hotplug hardware including hot-add vCPUs and Memory
- Add and grow virtual disks including system disks and secondary volumes
- Rapidly deployment of VMs using golden-master templates
- Create clones – one-time copies of virtual machine
- Perform VM cold migrations, hot migrations and Storage VMotion
- Configure, manage, monitor and secure users and groups
- Understand the benefits and tradeoffs of network attached storage and Fibre, iSCSI SANs
- Deploy and use VMware Replication to hot back up and recover critical Virtual Machines
- Create and manage load balanced clusters
- Enable, configure and use Distributed Power Management to reduce electrical power by soft powering off unneeded servers
- Understand, create and manage high availability clusters to protect against VM service loss caused by server failures
- Monitor and tune virtual machine performance
- Patch and update servers using vCenter Update Manager
- Understand how VMware and third party products, including operating systems, are impacted by virtualization
- Understand and use advanced vSwitch settings like NIC Teaming and Security
- Troubleshoot common problems

Course Outline

Chapter 1 – Virtualization Infrastructure Overview

- Virtualization explained
- How VMware virtualization compares to traditional PC deployments
- Common pain points in PC Server management
- How virtualization effectively addresses common IT issues
- VMware vSphere software products

Chapter 2 – How to Install, Configure ESXi 6.0 Installable

- Understanding ESXi
- Selecting, validating and preparing your server
- Storage controllers, disks and partitions
• Software installation and best practices
• Joining ESXi to a Domain
• Local User Management and Policies
• First look at the VMware vSphere Client

Chapter 3 – Virtual and Physical Networking
• vNetwork standard and distributed virtual Switches
• Virtual Switches, Ports and Port Groups
• Creating VMkernel ports
• Creating, sizing and customizing Virtual Switches

Chapter 4 – Content Libraries & NAS Shared Storage
• Benefits Shared Storage offer to Virtual Infrastructure
• Shared Storage options
• NFS Overview
• Configuring ESX to use NFS Shares
• Configuring NFS for performance and redundancy
• NFS Use Cases
• Troubleshooting NFS connections

Chapter 5 – Virtual Hardware and Virtual Machines
• VM virtual hardware, options and limits
• Sizing and creating a new VM
• Assigning, modifying and removing Virtual Hardware
• Working with a VM’s BIOS
• VMware remote console applications
• Installing an OS into a VM
• Driver installation and customization

Chapter 6 – vCenter Server and the Next Generation Web Client
• The need for Identity Source management
• Installing the Platform Service Controller
• Installing and configuring vCenter Server Appliance
• Connecting Single Sign On (SSO) to Active Directory and other identity sources
• vCenter feature overview and components
• Organizing vCenter's inventory views
• Importing ESX hosts into vCenter management
• Installing and Using the vSphere Next Generation Web Client

Chapter 7 – VM Rapid Deployment using Templates, Clones
• Templates – Virtual Machine Golden Master images
• Creating, modifying, updating and working with Templates
• Patching, and refreshing Templates
• Cloning, one time copies of VMs
• Best practices for cloning and templating
• Adding and resizing virtual disks

Chapter 8 – ESXi and vCenter Permission Model
• VMware Security model
• Configuring local users and groups
• Managing local permissions
• vCenter security model
• Local, Domain and Active Directory users and groups
• How permissions are applied

Chapter 9 – Using Fibre and iSCSI Shared Storage
• Fibre SAN overview
• Identifying and using Fibre Host Bus Adapters
• Scanning and Rescanning Fibre SANs
• iSCSI overview
• Virtual and physical iSCSI adapters
• Connecting to iSCSI storage
• Scanning and rescanning iSCSI SANS
• Performance and redundancy considerations and best practices
• Understanding the benefits of VMware VAAI compliant storage

Chapter 10 – VMware File System (VMFS)
• Unique file system properties of VMFS
• Managing shared Volumes
• Creating new VMFS partitions
• Managing VMFS capacity with LUN spanning and LUN expansion
• Native and 3rd party Multipathing with Fibre and iSCSI SANs
• VMFS performance considerations
• VMFS scalability and reliability

Chapter 11 – ESX and vCenter Alarms
• Alarm categories and definitions
• Creating custom alarms and actions
• Reviewing alarms and acknowledging them

Chapter 12 – Resource Management and Resource Pools
• How ESX delivers resources to VMs
• Shares, Reservations and Limits
• CPU resource scheduling
• Memory resource scheduling
• Resource Pools
Chapter 13 – Consolidation with VMware Converter Standalone
- vCenter Converter overview
- Converting physical machines, virtual machines and OS Images
- Cold migrations of physical machines to virtual machines
- Hot migrations of physical machines to virtual machines

Chapter 14 – VM Hot and Cold Migration, Storage VMotion
- Cold Migrations to new ESX hosts, datastores
- Hot Migrations with VMotion
- VMotion requirements and dependencies
- How VMotion works – detailed explanation
- Troubleshooting VMotion
- Storage VMotion for hot VM disk migrations

Chapter 15 – Distributed Resource Scheduling Clusters
- Delegated resource management with Resource Pools
- Resource balanced clusters with VMware Distributed Resource Scheduler
- DRS Cluster configuration and tuning
- Per-VM cluster policy overrides
- Learn the features and benefits of DRS Power Management

Chapter 16 – Failure Recovery with High Availability Clusters
- High Availability options to minimize unplanned downtime
- VMware High Availability clusters
- VMware Fault Tolerance

Chapter 17 – Hot VM Protection with vSphere Replication
- Explain vSphere Replication features and Use Cases
- Import the vSphere Replication virtual appliance
- Configure vSphere Replication including Recovery Point Objectives (RPOs)
- Enable vSphere Replication on a VM
- Recover a VM using vSphere Replication

Chapter 18 – Patch Management with VMware Update Manager
- Configure and enable VMware Update Manager
- Establishing a patch baseline
- Verifying compliance and patching ESXi hosts

Chapter 19 – Managing Scalability and Performance
- VMkernel CPU and memory resource management mechanisms
- Tuning VM storage I/O performance
- Identifying and resolving resource contention
- Monitoring VM and ESX host performance
- Performance and capacity planning strategies

**Chapter 20 – Final Thoughts**
- Consolidation guidelines for VMs and Storage
- Determining which workloads to consolidate
- Other considerations