Microsoft®

6433A

Planning and Implementing Windows Server® 2008

Companion Content

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Module 1

Planning Server Deployment and Upgrade

Contents:

Lesson 1

Developing a Deployment Strategy

Contents:

Question and Answers

The Importance of Developing a Deployment Strategy

Question: In your organization, how do you propose to deploy Windows Server 2008?

Answer: Answers will vary.

Additional Reading

Windows Server 2008 R2 Editions

- [New and Updated Features in Windows Server 2008 R2](#)

- [Edition Comparison by Technical Specification](#)

- [Edition Comparison by Server Roles](#)

Upgrading to Windows Server 2008

- [Upgrading Windows Server 2008 R2 without media](#)

Windows Server 2008 Licensing

- [Licensing](#)

Microsoft Assessment and Planning (MAP) Toolkit

- [Microsoft Assessment and Planning (MAP) Toolkit for Microsoft Office 2010 & Office 365](#)

Lesson 2

Virtualization Considerations

Contents:

Question and Answers

Discussion: Choosing Between Virtual and Physical Deployments

Question: How will virtualization help A Datum resolve the issues in its current computing environment?

Answer: Server virtualization will help A Datum resolve the server utilization issues. By running multiple virtual machines on a single physical server, the organization will be able to increase server utilization significantly.

The organization may consider several options for resolving the server issue in its branch offices, including the use of server virtualization to simplify and standardize deployment in each branch office.

Question: What server workloads could you virtualize in your organization? How will you make the decisions about what to virtualize?

Answer: Most organizations begin by virtualizing test and development servers, because these servers typically do not have the same availability and performance requirements that production servers have. The first servers that organizations typically virtualize in production are those that are used lightly, such as Web servers. In many organizations, virtualization has become the default configuration. This means that the organization virtualizes all servers, unless there is a good reason not to virtualize a specific server.

Additional Reading

Considerations for Virtual Deployment

- [Microsoft server software and supported virtualization environments](#)

What Virtual Licenses Are Included?

- [Licensing FAQ](#)

- [About Licensing](#)

Designing Virtual Machines for Applications

- [Running Domain Controllers in Hyper-V](#)

- [Running SQL Server 2008 in a Hyper-V Environment - Best Practices and Performance Recommendations](#)

- [Performance and capacity requirements for Hyper-V](#)

Lesson 3

Selecting a Deployment Automation Strategy

Contents:

Question and Answers

Discussion: What Is Your Deployment Strategy?

Question: How do you currently deploy operating systems within your organization?

Answer: Answers will vary, but most organizations implement some sort of imaging strategy and many use infrastructure services to distribute images.

Question: What are the advantages and disadvantages of your chosen deployment strategy?

Answer: Answers will vary. Use the discussion to direct students to the benefits of deployment strategies for various scenarios. For example:

- Branch offices with no local IT skills

- Many servers to deploy throughout the organization

- Similar server configurations throughout the organization

Detailed Demonstration Steps

Demonstration: How to Capture Images

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator**, with the password of **Pa$$w0rd**.

▶ **Create a folder for captured images.**

1. Switch to NYC-DC1.

2. Click **Start**, click **Computer**, and then double-click **Allfiles (D:)**.

3. In Windows Explorer, on the **menu**, click **New folder**.

4. Type **images** and then press Enter.

5. Right-click **images**, and then click **Properties**.

6. In the **images Properties** dialog box, click the **Sharing** tab.

7. Click **Advanced Sharing**, select the **Share this folder** check box, and then click **Permissions**.

8. In the **Permissions for images** dialog box, select the **Full Control Allow** check box, click **OK**, and in the **Advanced Sharing** dialog box, click **OK**.

9. In the **images Properties** dialog box, click the **Security** tab, and then click **Edit**.

10. In the **Permissions for images** dialog box, in the **Group or user names** list, click **Users(CONTOSO\Users)**.

11. In the **Permissions for Users** list, select the **Full control Allow** check box, and then click **OK**.

12. In the **images Properties** dialog box, click **Close**.

▶ **Prepare the source computer.**

1. Switch to NYC-SVR1.

2. Click **Start**, and in the **Search** box, type **C:\windows\system32\sysprep\Sysprep.exe**, and then press Enter.

3. In the **System Preparation Tool 3.14** dialog box, in the **Shutdown Options** list, click **Shutdown**.

4. Click **OK**. Sysprep begins to prepares the system and then the computer is shutdown.

▶ **Mount a customized Windows PE image.**

1. On the host computer, in the **6433A-NYC-SVR1 on localhost – Virtual Machine Connection** window, on the menu, click **Media**.

2. Point to **DVD Drive**, and then click **Insert Disk**.

3. In the **Open** dialog box, in the **File name** box, type **C:\Program Files\Microsoft Learning\6433\Drives\winpe_amd64.iso**, and then click **Open**.

4. On the **menu**, click **Action**, and then click **Start**.

5. In the virtual machine window, press any key to boot from CD or DVD.

▶ **Capture the source computer as an image.**

1. At the command prompt, type the following command, and then press Enter.

```
Net use I: \\nyc-dc1\images /user:contoso\administrator *
```

2. At the Command Prompt, type the following command, and then press Enter.

```
Pa$$w0rd
```

3. At the Command Prompt, type the following command, and then press Enter.

```
G:\imagex /capture f:\ i:\Contoso.wim "Contoso Server Image"
```

📝 **Note**   The capture process in this demonstration can be time-consuming. You do not need to complete this process as an image is available for the next demonstration in the D:\Labfiles folder on NYC-DC1.

4. When the process is completed, on the host computer, in the **6433A-NYC-SVR1 on localhost –** Virtual Machine Connection window, on the **menu**, click **Action**, and then click **Turn Off.**

📝 **Note**   Leave all virtual machines in their current state for the subsequent demonstration.

Demonstration: How to Edit Images

Detailed demonstration steps

📝 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. They should still be running from the previous demonstration.

▶ **Examine an existing WIM image file.**

1. Switch to NYC-DC1.

2. Click Start, point to All Programs, click Microsoft Windows AIK, and then click Deployment Tools Command Prompt.

3. At the command prompt, type the following command, and then press Enter.

```
D:
```

4. At the command prompt, type the following command, and then press Enter.

```
Cd\labfiles\Mod01\Images
```

5. At the command prompt, type the following command, and then press Enter.

```
Dir
```

6. At the command prompt, type the following command, and then press Enter.

```
Dism /get-wiminfo /wimfile:D:\labfiles\Mod01\images\Contoso.wim
```

▶ **Mount the existing image.**

1. At the command prompt, type the following command, and then press Enter.

```
Dir D:\labfiles\mod01\servicing
```

2. At the command prompt, type the following command, and then press Enter.

```
Dism /mount-wim /wimfile:D:\labfiles\Mod01\images\Contoso.wim /index:1
/mountdir:D:\labfiles\Mod01\servicing
```

3. At the command prompt, type the following command, and then press Enter.

```
Dism /get-mountedwiminfo
```

4. At the command prompt, type the following command, and then press Enter.

```
Dir D:\labfiles\Mod01\servicing
```

5. At the command prompt, type the following command, and then press Enter.

```
Dism /image:D:\Labfiles\Mod01\servicing /?
```

▶ **Add drivers to the image.**

1. At the command prompt, type the following command, and then press Enter.

```
Dism /image:D:\Labfiles\Mod01\servicing /get-drivers
```

2. At the command prompt, type the following command, and then press Enter.

```
Dism /image:D:\Labfiles\Mod01\servicing /add-driver
/driver:D:\labfiles\Mod01\Drivers\itype\setup64\files\driver\type64\type64.inf
```

3. At the command prompt, type the following command, and then press Enter.

```
Dism /image:D:\Labfiles\Mod01\servicing /get-drivers
```

4. At the command prompt, type the following command, and then press Enter.

```
Dism /unmount-wim /mountdir:D:\labfiles\Mod01\servicing /commit
```

📋 **Note**   Revert all virtual machines.

Lesson 4

Implementing a Deployment Automation Strategy

Contents:

Question and Answers

High-Touch Retail Media Deployments

Question: What do you see as the key limitations in the preceding deployment method?

Answer: Answers will vary, but might include the following:

- IT professionals are required to initiate interactive installations.

- USB memory sticks with individual answer files are inefficient.

- Multiple copies of the retail media are required.

- The method does not scale well, but suits small, one-off deployments.

High-Touch Standard Image Deployments

Question: How does this deployment method address your comments regarding the high-touch retail media deployment method?

Answer: Although you still need a technician to initiate the installation, you do not require multiple copies of the retail media. The solution still does not scale well because of the interaction required.

Discussion: Choosing a Deployment Topology

Question: How would you use Windows Deployment Services to aid deployment?

Answer: Answers may vary, but important points to consider are:

- Use answer files to automate the image selection process during deployment.

- Use answer files to automate the responses during setup, including domain-joining.

- Create a custom image.

- Capture the image and upload to Windows Deployment Services.

- Distribute the image to the servers across the network.

Question: Which elements in your current infrastructure support Lite-Touch Installations?

Answer: LTI requires minimal infrastructure. In this scenario, you already have the required infrastructure to deploy Windows Server 2008 R2 by using LTI, in terms of file servers and a managed network. In addition, your corporate head office has already prepared a standardized image, so you do not need to create a custom image of Windows Server 2008 R2. You only need to focus on how to deploy this image efficiently and effectively.

Question: Which deployment method would you choose for the three offices?

Answer: You need to deploy to three offices. For deployment to the Rome and Paris office, you can use Windows Deployment Services to initiate the destination computer and install the image from the deployment share. You can install Windows Server 2008 R2 on the other available server, and configure the Windows Deployment Services server role. This is because the server is located in the Rome office, and the Paris office has a high-speed connection to the Rome office.

For the London office, use the LTI deployment media. You can prepare this media at your office and ship it to the London office, or ask the IT support in London to download it from your file server. The IT support in London can then use this LTI deployment media to start the deployment process and install Windows Server 2008 R2 to the server computers in the London office.

Module Reviews and Takeaways

Review questions

Question: From which version of Windows Server can you upgrade to Windows Server 2008 R2 Enterprise Server Core?

Answer: Server Core installation of Windows Server 2008 Standard with or without SP2 or Server Core installation of Windows Server 2008 Enterprise with or without SP2.

Question: Which command-line tool can be used on all editions of Windows Server 2008 R2, both Server Core and Full, to install additional server roles from the command line?

Answer: Dism.exe.

Question: Which volume activation method is best suited for network environments that have in excess of 30 computers?

Answer: KMS.

Question: Your organization has different server builds; none are identical. You have chosen to use customized images to aid deployment. Should you think about using thick or thin images?

Answer: Thin would be most appropriate; use Group Policy and scripts to automate application deployment after the servers are deployed. Thick images contain too much customization for this scenario.

Question: To automate high-touch, retail media deployments, what tools do you need?

Answer: Retail media, Windows AIK, and removable media.

Question: How is Windows AIK useful with Windows Deployment Services deployments?

Answer: Windows AIK provides tools such as ImageX.exe, Sysprep.exe, and Windows SIM that enable you to manage images for use by Windows Deployment Services. For example, you can use Windows SIM to create and configure answer files to automate Windows Deployment Services deployments; you can use Sysprep to generalize a capture image for Windows Deployment Services; additionally, Windows AIK provides a number of Windows PE images and management tools.

Question: Your organization wants to implement a lite-touch deployment strategy. Besides using MDT 2010, what tools would be useful in helping you to perform lite-touch deployments?

Answer:

- MAP Toolkit
- ACT Toolkit
- Volume-licensed media
- Microsoft Deployment Toolkit
- Windows AIK
- Installation media or Windows Deployment Services to start the client computers during deployment

Best Practices Related to Windows Server 2008 Deployment

Supplement or modify the following best practices for your own work situations:

- Remember to consider CALs when upgrading to Windows Server 2008 R2.

- In virtualized environments, consider using Windows Server 2008 R2 Datacenter to simplify server licensing.

- When deploying Windows Server 2008 R2 to multiple computers, consider the use of automated deployment.

Tools

Tool	Use for	Where to find it
Microsoft Solution Accelerators	Obtaining tools and guidance for deploying Microsoft technologies	On the Microsoft TechNet website
Microsoft Assessment and Planning Toolkit	Identifying whether your organization is ready to deploy Windows Server 2008	On the Microsoft Assessment and Planning Toolkit page on the Microsoft TechNet website
Windows Automated Installation Kit	Automating the installation of Windows Server 2008	On the Automated Installation Kit (AIK) for Windows Vista SP1 and Windows Server 2008 page on the Microsoft website
Windows Deployment Services	Centrally creating and deploying Windows Server 2008 images	A server role in Windows Server 2008
Microsoft Deployment Toolkit	Planning and performing automated installations of Windows Server 2008	On the Microsoft Deployment Toolkit page on the Microsoft TechNet website
WDSUtil.exe	Command-line management of Windows Deployment Services	Part of Windows Deployment Services
Dism.exe	Offline and online servicing of images	Part of Windows AIK

Lab Review Questions and Answers

Question: In the lab, the servers in the branch offices at Contoso ran Windows Server 2003. What difference would the fact that they were running Windows 2000 Server have made, if any?

Answer: In-place upgrades are not supported from Windows 2000 Server, so a migration strategy would need to have been developed.

Question: In the lab, the fact that some servers and clients are isolated from the Internet presented you with a specific issue. What was it?

Answer: Activation from servers (and client workstations) that are isolated from the Internet must be performed manually with activation keys, or by using KMS or MAK.

Module 2

Planning Server Management and Delegated Administration

Contents:

Lesson 1

Remote Server Management Tools

Contents:

Question and Answers

Benefits of Remote Administration

Question: How are you using remote management tools in your current environment?

Answer: This question is designed to initiate discussion amongst your students regarding remote management tools. There is no right or wrong answer. Guide the discussion to allow for each student to share his or her experiences with the class. Provide references from your experiences to add to the discussion, where applicable.

Remote MMC Consoles

Question: What advantages does connecting remotely by using Server Manager have over connecting remotely by using MMCs for individual server components?

Answer: The Server Manager console is already pre-populated with the MMC snap-ins for installed server roles and server features. If connecting by using the individual consoles, you need to know what server roles and features are installed on the remote server. Also, Server Manager provides a single, comprehensive management tool, compared to multiple individual MMC.

Detailed Demonstration Steps

Demonstration: Remote Management of a Windows Server

Detailed demonstration steps

> **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-CL1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator**, with the password,**Pa$$w0rd**.

▶ **Enable WinRM on NYC-CL1 and NYC-DC1.**

1. Switch to NYC-DC1.

2. On NYC-DC1, click **Start**, type **cmd** in the Start Menu Search field, and then press Enter.

3. In the Command Prompt window, type the following, and then press Enter.

```
Winrm qc
```

4. At the **Make these changes [y/n]** prompt, type **Y**, and then press Enter.

5. Repeat steps 2 to 4 for NYC-CL1.

▶ **Use winrs.exe to view the operating system version for NYC-DC1 remotely from NYC-CL1.**

1. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter.

```
winrs –r:NYC-DC1 "ver"
```

▶ **Establish a Windows PowerShell session from NYC-CL1 with a remote server.**

1. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter.

```
powershell
```

2. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter.

```
Enter-PSSession –computername NYC-DC1
```

▶ **Import the ServerManager module for Windows PowerShell.**

1. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter. This command will import the ServerManager module into the PowerShell environment on NYC-DC1.

```
Import-Module ServerManager
```

▶ **Install the Telnet Server feature on NYC-DC1 using Windows PowerShell.**

1. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter. This command will list all available Windows features beginning with "Tel" Notice that both features are not installed.

```
Get-WindowsFeature Tel*
```

2. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter.

```
Add-WindowsFeature Telnet-Server
```

3. On NYC-CL1, in the Command Prompt window, type the following, and then press Enter. Notice that the Telnet Server feature is now installed.

```
Get-WindowsFeature Tel*
```

Lesson 2

Decentralizing Systems Administration

Contents:

Question and Answers

Benefits of Role-Based Access Control

Question: Are you currently implementing any RBAC permission delegation in your organization?

Answer: This is a discussion question by design. It is intended to allow students to relate their experience with RBAC, and discuss the merits or drawbacks to their implementation. Guide the discussion accordingly.

Discussion: Planning Role-Based Access Control

Question: Are sound RBAC principles being applied in Scenario 1?

Answer: No. The Domain Admins group is a powerful group with wide-reaching permissions in the domain. Role groups should be created in AD DS that represent the key administrative tasks in the environment. Required permissions should be assigned to these groups for the necessary Active Directory objects. If a staff member is responsible for performing one of these roles, their user account should be assigned to the job role groups and modified when roles are rotated. This way, each staff member has only the privileges they need to perform their job.

Question: How can the permissions in Scenario 2 be assigned by using RBAC?

Answer: A group called Research Account Management should be created. This group should be delegated permission to modify user accounts in the Research OU (this could be done by using the Delegation of Authority wizard). The Research manager's account (or the Research Manager group, if one exists) should be made a member of this new Research Account Management group. This allows the Research manager to be assigned the necessary permissions. In addition, these permissions can be assigned to other users if necessary by simply modifying membership to the Research Account Management group.

Question: How can RBAC be applied in Scenario 3?

Answer: Create a new group called Miami AD DS Admins and place the Miami IT staff user accounts into this group. Delegate full control over the Miami Site to this new group in Active Directory Sites and Services.

Detailed Demonstration Steps

Demonstration: Delegating Control of Active Directory Objects

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 virtual machine to complete this demonstration. Log on to the virtual machine as **Contoso\Administrator**, with the password,**Pa$$w0rd**.

1. Switch to NYC-DC1.

2. On NYC-DC1, click **Start**, click **Administrative Tools**, and then click **Active Directory Users and Computers**.

3. In the **Active Directory Users and Computers** window, right-click the **Contoso.com** domain node, and then click **Delegate Control**.

4. In the **Delegation of Control Wizard** window, click **Next**.

5. On the **Users or Groups** page, click the **Add** button.

6. In the **Select Users, Computers, or Groups** window, type **IT** into the **Enter the object names to select** field, click the **Check Names** button, and then click **OK**.

7. On the **Users or Groups** page, click **Next**.

8. Show the students the list of common tasks.

9. On the **Tasks to Delegate** page, select **Create a custom task to delegate,** and then click **Next**.

10. On the **Active Directory Object Type** page, ensure that **This folder, existing objects in this folder, and creation of new objects in this folder** is selected, and then click **Next**.

11. On the **Permissions** page, select the check box next to **Full Control**, and then click **Next**.

12. On the **Completing the Delegation of Control Wizard** page, click **Finish**.

13. Close the **Active Directory Users and Computers** window.

Module Reviews and Takeaways

Review questions

Question: What additional considerations need to be taken into account when managing servers remotely by using Windows PowerShell in a workgroup environment?

Answer: The remote server will need to be added to the list of TrustedHosts in the WinRM service on the client. Proper Administrative credentials will need to be used to connect to the remote server as well.

Question: Which versions of Windows natively support remote management, using Windows PowerShell?

Answer: Windows Server 2008 R2 and Windows 7.

Question: Why should the Domain Admins built-in group not typically be part of a typical role-based access control group structure?

Answer: The permissions assigned to Domain Admins are too far reaching and broad in scope to apply to a specific role. Use of accounts with membership in this group should be limited to specific administrative situations.

Question: Which three Windows components combine to provide auditing of Active Directory objects?

Answer: Security Access Control Lists, Group Policy and the Windows Security Log.

Windows Server 2008 R2 Features Introduced in this Module

Windows Server 2008 R2 feature	Description
Remote Desktop Services (RDS)	RDS is the renamed version of Terminal services.
Windows PowerShell Remote Administration Features	PowerShell 2.0 includes several cmdlets that allow for remote execution of Windows Powershell code on remote computers.
Remote management of Server Core installation by using Server Manager	Windows Server 208 R2 allows you to remotely manage Server Core installations by using the Server Manager console.

Tools

Tool	Use for	Where to find it
Remote Desktop Connection	Connecting remotely to Windows computers	On the Start menu, under Accessories
Remote Desktops console	Connecting remotely to Windows computers	MMC and as part of RSAT
Remote Server Administration Tools (RSAT)	Remotely managing Windows Server 2008 from other Windows computers	http://go.microsoft.com/fwlink/?LinkID=224545

Tool	Use for	Where to find it
Winrm.exe	Managing the Windows Remote Management service	The command-line
Winrs.exe	Running remote commands on other Windows computers	The command-line
Windows PowerShell 2.0	Performing remote management tasks	On the Start menu in Windows Server 2008 R2 and Windows 7
Windows Management Framework Core Package (PowerShell 2.0 and WinRM 2.0).	Allowing remote PowerShell functionality on Windows operating systems prior to Windows Server 2008 R2 and Windows 7	http://go.microsoft.com/fwlink/?LinkID=224546
Server Manager	Managing server configuration, both locally and remotely	On the Start menu in Windows Server 2008 or as part of RSAT
Delegation of Control Wizard	Delegating permissions in Active Directory	In Active Directory Users and Computers

Module 3

Planning Network Addressing and Name Resolution

Contents:

Lesson 1

Provisioning IPv4 Addresses on Enterprise Networks

Contents:

Question and Answers

Discussion: Planning an IP Addressing Scheme

Question: How many subnets do you think this region will require?

Answer: There are 300 computers in the region. The specification states that around 50 computers should be deployed in each subnet. You also need to plan for growth of around 25 percent Six subnets are required in the region to host computers, but an additional subnet for each location should be planned for to host the growth in computers. This is a total of nine subnets.

Question: How many hosts will you deploy in each subnet?

Answer: The specification states that you must deploy a maximum of 50 host computers for each subnet.

Question: What subnet mask will you use for each branch?

Answer: The current network address for the region is 172.16.16.0/20. This leaves 12 bits to allocate to subnets and hosts. To express 9 subnets, you would require 4 bits, since 3 bits only provides for 8 subnets. Four bits actually provides for 16 subnets, which is plenty. This is a decimal mask of 255.255.255.0.

Question: What are the subnet addresses for each branch?

Answer:

Branch 1:

172.16.16.0/24

172.16.17.0/24

172.16.18.0/24

Branch 2:

172.16.19.0/24

172.16.20.0/24

172.16.21.0/24

Branch 3:

172.16.22.0/24

172.16.23.0/24

172.16.24.0/24

Question: What range of host addresses are in each branch?

Answer:

Branch 1:

172.16.16.1 > 172.16.16.254

172.16.17.1 > 172.16.17.254

172.16.18.1 > 172.16.18.254

Branch 2:

172.16.19.1 > 172.16.19.254

172.16.20.1 > 172.16.20.254

172.16.21.1 > 172.16.21.254

Branch 3:

172.16.22.1 > 172.16.22.254

172.16.23.1 > 172.16.23.254

172.16.24.1 > 172.16.24.254

Question: Are public IP addresses required for this scenario?

Answer: No. All communications occurs within the corporate intranet.

Question: What are the other private IP addresses you could use?

Answer: Private address ranges are shown in the following table.

Class	Mask	Range
A	10.0.0.0/8	10.0.0.0-10.255.255.255
B	172.16.0.0/12	172.16.0.0-172.31.255.255
C	192.168.0.0/16	192.168.0.0-192.168.255.255

Question: What other recommendations would you make regarding the allocation of IP addresses?

Answer:

- Allocate manual IP addresses sparingly.

- When you do so, allocate the same range in each subnet.

- Always assign the same subnet address to the same device – for example, assign the router the .1 address, the DC the .2 address. This makes life easier for installers and troubleshooting.

Benefits of Using DHCP

Question: What are the benefits of using an automatic IP address allocation system? Discuss possible benefits with the class.

Answer: Possible benefits include:

- Easing the administrative burden

- Simplifying the address allocation scheme

- Helping to reduce configuration errors

- Centralization of network configuration helps make network reconfigurations easier and simpler to achieve

Additional Reading

Planning Scopes

- [Microsoft TechNet: Setting Up Scopes](#)

Planning DHCP Server Placement

- [Technet: Configuring Scopes](#)

- [Technet: DHCP Best Practices](#)

Lesson 2

Provisioning IPv6 Addresses on Enterprise Networks

Contents:

Detailed Demonstration Steps

Demonstration: How to Allocate IPv6 Addresses with DHCP

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-CL1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd.**

▶ **Configure a DHCP Scope for IPv6 Clients**

1. Switch to NYC-DC1.

2. Click **Start**, and in the **Search** box, type **network and sharing center** and then press ENTER.

3. In Network and Sharing Center, click **Change adapter settings.**

4. In Network Connections, right-click **Local Area Connection 2** and then click **Properties**.

5. In the **Local Area Connection 2 Properties** dialog box, double-click **Internet Protocol Version 6 (TCP/IPv6)**.

6. In the **Internet Protocol Version 6 (TCP/IPv6) Properties** dialog box, click **Use the following IPv6 address**.

7. In the **IPv6 address** box, type **2001:db8:0:1:1a81:f438:3222:e1a2.**

8. In the **Subnet prefix length** box, type **64**.

9. In the **Preferred DNS server** box, type ::**1** and then click **OK**.

10. In the **Local Area Connection 2 Properties** dialog box, click **OK**.

11. Click **Start**, point to **Administrative Tools,** and then click **DHCP**.

12. In DHCP, in the navigation pane, expand **nyc-dc1.contoso.com** and then click **IPv6**.

13. Right-click **IPv6** and then click **New Scope.**

14. In the **New Scope Wizard**, click **Next**.

15. On the **Scope Name** page, in the **Name** box, type **Contoso IPv6 Scope** and then click **Next**.

16. On the **Scope Prefix** page, in the **Prefix** box, type **2001:db8:0:1**:: and then click **Next**.

17. On the **Add Exclusions** page, click **Next**.

18. On the **Scope Lease** page, click **Next**.

19. On the **Completing the New Scope Wizard** page, click **Finish**.

20. In the navigation pane, click **Server Options** and then double-click **00023 DNS Recursive Name Server IPV6 Address List**.

21. In the **Server Options** dialog box, click **Remove** twice.

22. In the **New IPv6** address box, type **2001:db8:0:1:1a81:f438:3222:e1a2**, click **Add**, and then click **OK**.

▶ Configure the client computer

1. Switch to NYC-CL1.

2. Click **Start**, and in the **Search** box, type **network and sharing center** and then press ENTER.

3. In Network and Sharing Center, click **Change adapter settings**.

4. In Network Connections, right-click **Local Area Connection 3** and then click **Properties**.

5. In the **Local Area Connection 3 Properties** dialog box, clear the **Internet Protocol Version 4 (TCP/IPv4)** check box and then click **OK**.

6. Click **Start**, and in the **Search** box, type **cmd.exe** and then press ENTER.

7. At the command prompt, type **ipconfig.exe** and then press ENTER.

📋 **Note** Leave all virtual machines in their current state for the subsequent demonstration.

Additional Reading

Address Autoconfiguration for IPv6

- [Introduction to IP Version 6](#)

Lesson 3

Transitioning to IPv6

Contents:

Question and Answers

Discussion: What Must You Consider When Planning to Migrate to IPv6?

Question: How is your organization planning to implement IPv6? Discuss with the class.

Answer: Answer will vary.

Question: When migrating from IPv4 to IPv6, what must you consider? Discuss with the class.

Answer:

Applications

Because some application might hard-code data objects, such as IP address length or IP address validation, running the application using IPv6 may not be possible. An example is an application that uses a classic IPv4 configuration field, rather than a name field, to configure server connectivity.

Infrastructure and Device Upgrades

Devices in the network must support IPv6, including routers that you must configure to route IPv6 traffic and manage multiple IPv6 subnets, and network printers, which often have hardwired IP implementations that you cannot upgrade to support IPv6 communications.

Discussion: Choosing a Transition Technology

Question: Which transition technology do you propose?

Answer: ISATAP is indicated. ISATAP is designed to provide IPv4 to IPv6 connectivity across an IPv4 intranet, which is the situation at Contoso.

You can implement ISATAP without needing to make configuration changes to the hosts as the ISATAP routers can advertise the required configuration information.

DHCP servers are not affected.

6to4 would not be suitable; it is a technology used to provide IPv6 connectivity between IPv6 sites and hosts across the IPv4 Internet.

Teredo would be unsuitable; it enables you to tunnel IPv6 across the Internet when the clients are behind an IPv4 NAT.

Question: What configuration changes must you make to implement this transition?

Answer: You must configure the routers in Contoso to support ISATAP and to advertise the IPv6 configuration to the branch offices. You must also create a DNS record for the ISATAP router.

Additional Reading

IPv4 and IPv6 Coexistence

- [IPv6 Transition Technologies](#)

Discussion: What Must You Consider When Planning to Migrate to IPv6?

- [IPv6 Transition Technologies](#)

Process of Transitioning to IPv6

- [IPv6 Transition Technologies](#)

What Is Teredo?

- [IPv6 Transition Technologies](#)

What Is IP-HTTPS?

- [3 Protocol Details](#)

Lesson 4

Provisioning DNS Services on Enterprise Networks

Contents:

Detailed Demonstration Steps

Demonstration: How to Delegate a DNS Domain

Detailed demonstration steps

📝 **Note**   You require the 6433A-NYC-DC1, 6433A-NYC-SVR1, and 6433A-NYC-CL1 virtual machines to complete this demonstration. 6433A-NYC-DC1 and 6433A-NYC-CL1 are both running from the previous demonstration. Now start 6433A-NYC-SVR1 and log on to the virtual machine as **Contoso\Administrator** with the password of **Pa$$w0rd.**

▶ **Configure the DNS suffix for NYC-SVR1**

1. Switch to NYC-SVR1.

2. Click **Start**, right-click **Computer** and then click **Properties**.

3. In System, click **Advanced system settings**.

4. In the **System Properties** dialog box, click the **Computer Name** tab, and then click **Change**.

5. In the **Computer Name/Domain Changes** dialog box, click **More**.

6. In the **DNS Suffix and NetBIOS Computer Name** dialog box, in the **Primary DNS suffix of this computer** box, type **south.contoso.com**.

7. Clear the **Change primary DNS suffix when the domain membership changes** check box and then click **OK**.

8. In the **Computer Name/Domain Changes** dialog box, click **OK**.

9. In the **Computer Name/Domain Changes** prompt, click **OK**.

10. In the **System Properties** dialog box, click the **Close**.

11. In the **Microsoft Windows** dialog box, click **Restart Now**.

12. When the computer has restarted, log on with the following credentials:

    *   User name: **Administrator**

    *   Password: **Pa$$w0rd**

    *   Domain: **Contoso**

▶ **Install the DNS Server role on NYC-SVR1**

1. On the **Taskbar**, click **Server Manager**.

2. In Server Manager, in the navigation pane, click **Roles**.

3. In the Results pane, click **Add Roles.**

4. In the Add Roles Wizard, click **Next**.

5. On the **Select Server Roles** page, select the **DNS Server** check box, and then click **Next**.

6. On the **DNS Server** page, click **Next**.

7. On the **Confirm Installation Selections** page, click **Install**.

8. On the **Installation Results** page, click **Close**.

9. Close Server Manager.

▶ **Configure the south.contoso.com DNS domain**

1. Switch to NYC-DC1 and close all open windows.

2. Click **Start**, point to **Administrative Tools** and then click **DNS**.

3. In DNS Manager, in the navigation pane, expand **NYC-DC1**, expand **Forward Lookup Zones**, expand **Contoso.com** and then click **south**. You should be able to see a Host (A) record for NYC-SVR1.

4. Switch to NYC-SVR1.

5. Click **Start**, point to **Administrative Tools** and then click **DNS**.

6. In the navigation pane, expand **NYC-SVR1**, and then click **Forward Lookup Zones**.

7. Right-click **Forward Lookup Zones**, and then click **New Zone.**

8. In the **New Zone Wizard**, click **Next**.

9. On the **Zone Type** page, click **Primary zone** and then click **Next**.

10. On the **Zone Name** page, in the **Zone name** box, type **south.contoso.com** and then click **Next**.

11. On the **Zone File** page, click **Next**.

12. On the **Dynamic Update** page, click **Allow both nonsecure and secure dynamic updates** and then click **Next**.

13. On the **Completing the New Zone Wizard** page, click **Finish**.

14. In the navigation pane, click **south.contoso.com.**

15. Switch to NYC-DC1.

16. In DNS Manager, in the navigation pane, click **Contoso.com**, right-click **south** and then click **Delete**.

17. In the **DNS** dialog box, click **Yes**.

18. Right-click **Contoso.com** and then click **New Delegation**.

19. In the New Delegation Wizard, click **Next**.

20. On the **Delegated Domain Name** page, in the **Delegated domain** box, type **south** and then click **Next**.

21. On the **Name Servers** page, click **Add**.

22. In the **New Name Server Record** dialog box, in the **Server fully qualified domain name (FQDN)** box, type **NYC-SVR1.south.contoso.com.**

23. In the **IP Address** list, type **10.10.0.24** and then press **ENTER**.

24. Click **OK**.

25. On the **Name Servers** page, click **Next**.

26. On the **Completing the New Delegation Wizard** page, click **Finish**.

📋 **Note** Revert all virtual machines.

Additional Reading

Planning Zone Transfers

- [Microsoft TechNet: Understanding zones and zone transfer](#)

Planning DNS Forwarding

- [Microsoft TechNet: Understanding Forwarders](#)

Name Resolution with WINS

- [DNS Server GlobalNames Zone Deployment documentation from Microsoft](#)

Module Reviews and Takeaways

Review questions

Question: You have two subnets in your organization and want to use DHCP to allocate addresses to client computers in both subnets. You do not want to deploy two DHCP Servers. What factors must you consider?

Answer: The router that interconnects the two subnets must support DHCP relaying, or else you must place a relay on the subnet that does not host the DHCP server. Additionally, you should consider the impact on service availability if your single DHCP server fails.

Question: What is the difference between a subdomain in a DNS zone, and a delegated zone?

Answer: The former has no name servers of its own, while the latter has authoritative name servers of its own.

Question: What are the advantages of Active Directory integrated zones?

Answer: Zone transfers are automatic, handled by the Active Directory replication process. These transfers are more secure than traditional zone transfers.

Question: What kind of IP address does every IPv6 client automatically assign itself?

Answer: A link-local IP address.

Question: What is the main purpose of a Teredo tunnel?

Answer: A Teredo tunnel provides the ability for IPv6 to communicate across IPv4 NATs.

Question: Your organization has grown and your IPv4 scope has almost run out of addresses. What could you do?

Answer: Implement a superscope by combining the existing scope and a new scope.

Tools

Tool	Use for	Where to find it
IPConfig.exe	IPConfig.exe	IPConfig.exe
Netsh.exe	Configuring both client and server-side IP settings, including those for DHCP Server role	Command-line
DHCPLoc.exe	Locate DHCP servers on the local subnet	Command-line

Windows Server 2008 R2 Features Introduced in this Module

Windows Server 2008 R2 feature	Description
IP-HTTPS	Tunnels IPv6 packets inside an IPv4-based secure HTTPS session.
Teredo Server and Relay	Teredo server functionality for IPv6 communication over the Internet.

Module 4

Planning and Provisioning Active Directory Domain Services

Contents:

Lesson 1

Deploying Domain Controllers in Enterprise Organizations

Contents:

Question and Answers

Discussion: Implementing Multiple Forests

Question: Which scenarios would lead to the implementation of multiple Active Directory Domain Services forests?

Answer: Multiple schemas. Everything in the forest shares a common schema. Conflicts between applications or administration of the schema can introduce the need for an additional forest.

Resource forests. Some organizations may require multiple forests for isolation reasons, but need to share a common resource, for example, Microsoft Exchange Server 2000 and later. A separate forest can be created to host the shared resources, and forest-level trusts can be used to provide the authentication and authorization paths. A test environment canbe created as a resource forest.

Forest administrator distrust. Some organizations have an internal structure that includes more than one information technology (IT) team. When each IT team wants to control the forest while denying the other IT staff control, implementing multiple forests are a means to that end. This is a common scenario when companies merge, in government agencies, and at universities.

Legal regulations or geo-political reasons for application and/or data access. All domains in a single forest have automatic, two-way Kerberos trusts so that data and applications can be accessed easily. When working with some countries or regions, legal requirements may dictate the separation of data and applications. Multiple forests provide this separation.

Discussion: Implementing Multiple Domains and Domain Trees

Question: Which deployment scenarios might benefit from multiple Active Directory Domain Services domains?

Answer: In environments that consist of a large number of user or computer objects (100,000 or more), tests should be performed in the lab to ensure that the replication load does not overwhelm the replication topology for the domain. Multiple domains may be required to reduce the overall domain replication load.

A domain may be used to define security boundaries.

If Active Directory Domain Services has a large number of frequently changing attributes, it may be useful to break the environment into multiple domains to control the replication within the domains. Testing should be done in a lab to determine if multiple domains reduce the replication traffic in a significant way.

The compression algorithm used to replicate directory service changes across slow links is highly efficient. However, if slow links still cause issues for replication, a separate domain might be necessary. This scenario can be challenging when there are numerous changes occurring to directory service objects on a regular basis.

An existing Microsoft directory, running on an earlier operating system level, may need to be preserved. To do so, the environment can be separated into its own domain.

Question: Which deployment scenarios might benefit from multiple Active Directory Domain Services domain trees?

Answer: A domain tree may be used when partner domains require an over-arching security structure. In this case, a root domain could be created to define the parent, security-governing domain. Child domains could be created from the root domain for each organization.

Organizations requiring specific naming conventions or DNS structures could usethe domain naming structure of a domain tree.

Organizations requiring definitive security boundaries between departments or business sections could implement a domain tree reflecting the authoritative hierarchy of the organization.

Discussion: Designing a Forest

Question: What are your initial thoughts about a forest topology?

Answer: There is nothing to indicate that more than one forest would be necessary in this scenario.

Question: How many domains do you envisage using?

Answer: Four domains, one for each region and an empty forest root domain for Fabrikam.

Question: How many sites do you imagine will be required?

Answer: A specific number cannot be defined without knowing more about the branch and national office, but generally, one site should be configured for each physical location.

Question: Do you think that more than one tree is indicated?

Answer: There are no details in the scenario that indicate a requirement for multiple domain trees.

Question: How many forests do you envisage?

Answer: It appears likely that two forests are required; the existing Contoso forest and the new forest for Fabrikam. It is possible that objects from the Contoso forest could be migrated to a new domain in the Fabrikam forest at a later stage. It is probably undesirable to use the Contoso forest and add a new tree for Fabrikam, as the forest root would not be located in the Fabrikam worldwide headquarters.

Question: How does implementing Exchange Server affect your plans?

Answer: Exchange Server 2010 is deployed as a forest-level application; this means that only one Exchange Server organization can reside within a single forest. You would need to conduct research to determine if there was any reason to imagine that each region required a different Exchange Server organization. Also bear in mind that Exchange Server requires significant modifications to the Active Directory schema. Whenever you plan to deploy an application that requires schema changes shortly after deploying Active Directory, plan to make the schema changes with the initial Active Directory deployment.

Detailed Demonstration Steps

Demonstration: Seizing FSMO Roles

Detailed demonstration steps

📝 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to NYC-DC1 and NYC-SVR1 as **Contoso\Administrator**, with the password,**Pa$$w0rd**. Ensure that NYC-DC1 is fully started before starting NYC-SVR1.

▶ **Promote NYC-SVR1 to a domain controller (these steps should be performed prior to the demonstration).**

1. Switch to NYC-SVR1.

2. On NYC-SVR1, click **Start**, type **dcpromo** into the Start menu search field, and then press Enter.

3. In the **Active Directory Domain Services Installation Wizard** window, click **Next**.

4. On the **Operating System Compatibility** screen, click **Next**.

5. On the **Choose a Deployment Configuration** screen, click the radio button to select **Existing forest**, and then click **Next**.

6. On the **Network Credentials** screen, click **Next.**

7. On the **Select a Domain** screen, click **Next**.

8. On the **Select a Site** screen, click **Next**.

9. On the **Additional Domain Controller Options** screen, click to de-select both **DNS server** and **Global catalog,** and then click **Next**.

10. In the Infrastructure Master Configuration Conflict window, click **Do not transfer the Infrastructure master role to this domain controller. I will correct the configuration later**.

11. Onthe **Location for Database, Log Files, and SYSVOL** screen, click **Next**.

12. Onthe **Directory Services Restore Mode Administrator Password** screen, enter **Pa$$w0rd** into both the **Password** and **Confirm password** fields, and then click **Next**.

13. On the **Summary** screen, click **Next**.

14. On the **Completing the Active Directory Domain Services Installation Wizard** screen, click **Finish**.

15. In the **Active Directory Domain Services Installation Wizard** pop-up window, click **Restart Now**.

16. Log on to NYC-SVR1 as **Contoso\Administrator**, with the password,**Pa$$w0rd**.

▶ **Transfer the operations master role to another domain controller.**

1. On NYC-SVR1, click **Start**, click **Administrative Tools,** and then click **Active Directory Users and Computers**.

2. In the **Active Directory Users and Computers** window, in the console pane, right-click **Active Directory Users and Computers**, click **All Tasks,** and then click **Operations Masters**.

3. In the **Operations Masters** window, click the **PDC** tab, and then click the **Change** button.

4.   In the **Active Directory Domain Services** window, click **Yes**.

5.   In the **Active Directory Domain Services** window, click **OK**.

6.   Revert and shut down NYC-SVR1.

▶ **Seize an operations master role from another domain controller.**

1.   On NYC-DC1, click **Start**, click **Administrative Tools,** and then click **Active Directory Users and Computers**.

2.   In the **Active Directory Users and Computers** window, in the left pane, right-click **Active Directory Users and Computers**, click **All Tasks,** and then click **Operations Masters**.

3.   In the **Operations Masters** window, click the PDC tab. An error is reported that the current operations master is offline. Click the **Change** button.

4.   In the **Active Directory Domain Services** window, click **Yes**.

5.   In the **Active Directory Domain Services** window, click **Yes** to attempt a forced transfer.

6.   Click **OK**, and then click **Close**.

7.   Close the Active Directory Users and Computers window.

Note   Revert the virtual machines.

Additional Reading

Planning Forest and Domain Functional Levels

- [Active Directory Functional Levels Technical Reference](#)

Lesson 2

Planning Administrative and Management Structures for AD DS

Contents:

Question and Answers

Discussion: Organizational Unit Considerations

Question: What are some typical models for OU structure design?

Answer: Models may include Departmental, Geographic, or Object-based. The OU design can also be modeled onspecific line-of-business aspects.

Question: Which considerations should be taken into account when designing an OU structure?

Answer: Considerations may include any of thefollowing:How many objects exist in your Active Directory Domain Services environment?How will your Active Directory Domain Services environment be managed?How will your organization use Group Policy?How will administration be structured or how will Active Directory Domain Services objects be stored and replicated?In general, two levels of OUs are commonly implemented. A higher level of OUs to split the domain into units of delegation and a lower level designed to assign Group Policy objects.

Lesson 3

Planning a Maintenance Strategy for AD DS

Contents:

Question and Answers

Discussion: Maintaining AD DS

Question: What problems might occur in your Active Directory Domain Services environment that require maintenance?

Answer: Students will provide a variety of answers that may include database fragmentation, sprawl, performance degradation, replication issues, or defunct or corrupt objects.

Additional Reading

Configuring Active Directory Recycle Bin

- [Active Directory Recycle Bin Step-by-Step Guide](#)

Module Reviews and Takeaways

Review questions

Question: What advantages does separating two departments in an organization using Active Directory Domain Services domains have over using OUs within the same domain?

Answer: A domain provides a stronger security boundary and allows for more granular Active Directory Domain Services feature configuration for each separate domain. Additionally, the disadvantage is that another domain requires significantly more administrative and infrastructure overhead.

Question: What circumstances would lead you to configure cached passwords on a read-only domain controller in a remote branch?

Answer: If the RODC has an unstable or extremely slow WAN link to the closest domain controller, passwords would likely be cached. Also, if the RODC is handling more authentication requests than what the WAN link to the nearest DC can handle, password caching should be considered.

Question: When planning your organization's Group Policy structure, which set of Active Directory Domain Services objects are the most important to consider and implement properly?

Answer: Organizational Units, because they are the most granular and most common Active Directory Domain Services object that a GPO can be linked to.

Question: Why is baseline measurement and reporting so important for domain controllers?

Answer: Baselining gives you an idea of what "normal" looks like. Performance monitoring results compared with baseline results can identify even small changes in the Active Directory Domain Services environment that may indicate a larger problem.

Tools

Tool	Use for	Where to find it
Active Directory Users and Computers console	Seizing FSMO roles and Active Directory Domain Services object management	Administrative Tools
Performance Monitor	Monitoring server and Active Directory Domain Services specific performance counters	Start menu search dialog-type perfmon
Reliability Monitor	Monitoring general server health and consistency	Start menu search dialog–type reliability
Ntdsutil.exe	Managing and manipulating Active Directory Domain Services structure	Start menu search dialog–type Ntdsutil
Windows Server Backup console	Backing up and restoring Windows Server 2008 data	Install the Windows Server Backup feature
Dsamain.exe	Making an LDAP-readable copy of the Active	Start menu search dialog–type Dsamain.exe

Tool	Use for	Where to find it
	Directory Domain Services database	

Module 5
Planning Group Policy Strategy

Contents:

Lesson 1

Planning Group Policy Settings

Contents:

Question and Answers

Discussion: How Do You Use Group Policy?

Question: How does your organization implement GPOs?

Consider this question and be prepared to discuss your answers with the class.

Answer: Answer will vary, but may include:

- Distribute applications.

- Configure desktop and start menu settings.

- Configure security settings on client and server computers.

- Configure application settings.

- Run startup and logon scripts.

Group Policy Preferences

Question: When would you use Preferences, instead of Administrative Templates?

Answer: Answers will vary. Key decisions relate to the fact that GPO Administrative Templates are enforced, whereas Preferences are optional.

Detailed Demonstration Steps

Demonstration: How to Use Group Policy Preferences

Detailed demonstration steps

📄 **Note**   You require the 6433A-NYC-DC1 virtual machine to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator**, with the password, **Pa$$w0rd**.

▶ **Open Group Policy Management.**

1. Click **Start**, point to **Administrative Tools**, and then click **Group Policy Management**.

2. In Group Policy Management, expand **Forest: Contoso.com**, expand **Domains**, expand **Contoso.com**, and then click **Default Domain Policy**.

3. In the Group Policy Management Console dialog box, click **OK**.

▶ **Edit the Default Domain Policy.**

1. Right-click **Default Domain Policy**, and then click **Edit**.

2. In Group Policy Management Editor, under **User Configuration**, expand **Preferences**, expand **Windows Settings**, and then click **Drive Maps**.

▶ **Enable a drive mapping with a Group Policy preference.**

1. In the navigation pane, right-click **Drive Maps**, point to **New**, and then click **Mapped Drive**.

2. In the **New Drive Properties** dialog box, in the **Location** box, type **\\nyc-dc1\netlogon**.

3. In the **Drive Letter** list, click **N**, and then click the **Common** tab.

▶ **Configure Targeting for the preference.**

1. Select the **Item-level targeting** check box, and then click **Targeting**.

2. In the **Targeting Editor** dialog box, click **New Item**, and in the list, click **Security Group**.

3. In the **Group** box, type **Marketing**, and then click **OK**.

4. In the **New Drive Properties** dialog box, click **OK**.

5. Close all open windows.

📄 **Note**   Revert all virtual machines.

Lesson 2

Planning the Assignment of Group Policies

Contents:

Question and Answers

Discussion: Planning Group Policies (1)

Question: In general, is it better to implement fewer, large GPOs that combine different settings or more, than smaller GPOs that are focused on a different aspect of client computer management?

Answer: There is no right answer here. The more GPOs there are, the more is the client-side processing that occurs during computer startup and user logon. Therefore, you should aim to minimize the number of GPOs. However, if a GPO contains many diverse settings, it can be difficult to administer the GPOs because a change may affect a large section of the user population.

Question: To strike the right balance, what would you recommend?

Answer: Where possible:

- Bundle similar settings together in a GPO. For example, create a GPO that focuses on security settings and another that focuses on user desktop settings.

- Try to group settings that can easily be applied to high-level containers so that you can rely on inheritance to propagate the settings.

- Disable the User/Computer element in a policy where appropriate. Even non-configured settings are processed.

Lesson 3

Planning the Management of Group Policy Objects

Contents:

Question and Answers

Discussion: Managing Group Policy

Question: Who is responsible for managing Group Policy in your organization?

Answer: Many smaller organizations will have users with Domain Admins membership responsible for this. Ask whether delegation could be used by their organization. Larger organizations have often delegated this task.

Question: Does your organization back up GPOs?

Answer: Many smaller organizations perform only a full back up. Larger organizations may have a formal process for backing up Group Policy. Ensure that students understand why they would want to back up GPOs separately.

Question: Does your organization have a need to standardize GPOs by using starter policies?

Answer: Most smaller organizations will have a limited number of GPOs and consequently no need for starter GPOs. Larger organizations may use starter GPOs for different departments or locations.

Additional Reading

Considerations for Administering Group Policy Objects

- [Windows PowerShell Cmdlets for Group Policy](#)

Module Reviews and Takeaways

Review questions

Question: What are some of the ways you can speed up Group Policy processing?

Answer: You can speed up Group Policy processing by limiting the number of GPOs that are processed. Also, you should disable portions of a GPO that are not used. For example, disable the user portion of a GPO that only contains computer settings.

Question: You have configured a kiosk with an application for controlling manufacturing equipment. You would like all users on the kiosk to have the same configuration, regardless of the organizational unit that their user object resides in. How will you accomplish this?

Answer: You can use loopback processing to apply user settings from a GPO that applies to a computer. In this case, the user settings in a GPO that applies to the kiosk computer object will replace the user settings that apply to the user's object.

Question: How can you modify how Group Policy is processed and applied?

Answer: You can modify how Group Policy is processed and applied by using enforcement, blocking inheritance, and by using loopback.

Question: Is it possible to delegate Group Policy management for just an OU?

Answer: Yes, you can delegate the ability to create GPO links to a single OU. However, GPOs are created in a separate container and granting permission to create GPOs will be for the entire domain. If you need to tightly control GPO creation, the GPO can be created by a central administrator and then permission to edit the GPO can be delegated.

Question: In the past, you have created customized ADM templates and they were automatically included with the GPO on SYSVOL. This allowed the GPO to be properly edited from any location. You have now created a customized ADMX template and realize that it is stored locally. Others will not be able to edit the GPO. How can you resolve this?

Answer: Create a central store for ADMX templates by using GPMC. Then place the customized ADMX template in the central store. The central store is replicated to all domain controllers and will be available for anyone editing the GPO.

Question: Your organization has no formal plan in place for backing up GPOs. Only a full backup, including system state, is being performed each day. How can you improve this?

Answer: It is very difficult to recover GPOs from the system state of a domain controller. You can manually back up GPOs by using the GPMC. Alternatively, you can schedule backups to run daily or weekly by using the BackupAllGPOs.wsf script in C:\Program Files\GPMC\Scripts.

Best Practices Related to a Particular Technology Area in this Module

Supplement or modify the following best practices for your own work situations:

- Use Group Policy to manage settings on computers, rather than manually configuring each computer.

- Disable unnecessary parts of GPOs to increase processing speed.

- Plan your Active Directory OU structure with Group Policy in mind.

- Use security filtering and WMI filtering for more flexible GPO applications.

- Use loopback processing for special use computers such as kiosks and Remote Desktop Servers.

- Use starter GPOs to simplify the creation of new GPOs with similar settings.

- Back up GPOs before modifying them.

- Delegate the management of GPOs to OU administrators that are affected by them. For example, delegate the management of GPOs for a region to an administrator for that region. This can include linking and modifying the GPOs.

- Redirect folders to a server to simplify recovery if a client computer fails.

Lab Review Questions and Answers

Question: In the lab, you implemented a drive mapping by using preferences. How else could this have been achieved?

Answer: You could use a logon script.

Question: What would the difference to the users be?

Answer: Settings applied by policies are enforced, while those applied by preferences can be overridden by users.

Question: In the lab, you enforced the settings on the Enforced Security GPO. This GPO applied to the domain. Aside from using Security group filtering, how else could you have prevented the policy applying to computers in the training lab?

Answer: Apply the GPO more selectively to a container that does not contain the training lab computers.

Module 6

Planning Active Directory Certificate Services

Contents:

Lesson 1

Enterprise PKI Deployment and Administration

Contents:

Detailed Demonstration Steps

Demonstration: Create a Stand-Alone CA

Detailed demonstration steps

1. Switch to NYC-CA1.

2. Click **Start**, right-click **Computer,** and then click **Properties**.

3. On the **Computer Name** tab of Advanced system settings, set the Primary DNS Suffix of this computer enter contoso.com

4. Restart the computer.

5. In **Server Manager**, click **Roles**, and click **Add Roles**.

6. Choose the following options:

   - Select **the Active Directory Certificate Services** role.

   - Only select the **Certification Authority** role service.

   - Select the **Stand-alone** setup type.

   - Set the **Root CA** type.

   - Create a new Private Key.

   - Choose the **ECDSA_P521#Microsoft Software Key Storage Provider**

   - Select the **SHA512** hash algorithm

   - Set common name to **NYC-CA1-CA**

   - Set Validity to 5 years

7. When installation completes, start the **Certification Authority** console. Notice that the Certificate Templates node is not present on a stand-alone CA.

Demonstration: Enterprise Subordinate

Detailed demonstration steps

1. On **NYC-SVR1**, open the Server Manager console, click **Roles**, and then click **Add Roles**.

2. On the **Select Server Roles** page, select **Active Directory Certificate Services**.

3. On the **Specify Setup Type** page, select **Enterprise**.

4. On the **Specify CA Type** page, select **Subordinate CA**.

5. On the **Set Up Private Key** page, select **Create a new private key**.

6. On the **Request Certificate from a Parent CA** page, click **Browse**, and then click **ContosoCA**. Click **OK**, click **Next** twice, and then click **Install**.

Additional Reading

Certificate Services as an Infrastructure Role

- Active Directory Certificate Services Step-by-Step Guide

- Core Network Companion Guide: Deploying Computer and User Certificates

Windows Server 2008 R2 AD CS Features

- Active Directory Certificate Services Role

- What's New in Active Directory Certificate Services (2008 R2)

Enterprise and Stand-alone Certification Authority

- Build and Deploy the Root Certification Authority

Offline Root Certification Authority

- Checklist: Creating a certification hierarchy with an offline root certification authority

Enterprise Subordinate CA

- Setting up a Certification Authority

- Certification authority hierarchies

- Install an enterprise subordinate certification authority

Certification Authority Management

- Implement Role Based Administration

Planning CA Deployment

- Active Directory Certificate Services Resources

Lesson 2

Managing Certificate Templates

Contents:

Detailed Demonstration Steps

Demonstration: Creating a New Template

Detailed demonstration steps

1. On **NYC-SVR1**, right-click the **Certificate Templates** node in the **Certification Authority** console, and then click **Manage**.

2. Right-click the **Basic EFS** certificate template, and click **Duplicate Template**.

3. On the **Duplicate Template** dialog box, click **Windows Server 2008 Enterprise**, and click **OK**.

4. In the **Properties of New Template** dialog box, set the **Template Display Name** to **Advanced EFS**.

5. On the **Request Handling** tab, click **Archive subject's encryption private key**, and click **OK**.

6. On the **Security tab**, enable the **Autoenroll** permission for the **Authenticated Users group**.

7. On the **Cryptography** tab, set the **Algorithm name** to **ECDH_P521** and set the **Request hash** to **SHA512**

8. Click **OK** to close the **Certificate Templates** console.

9. Right-click the **Certificate Templates** node, click **New**, and then click **Certificate Template to Issue**.

10. Click **Advanced EFS**.

Demonstration: Enable Key Archiving

Detailed demonstration steps

1. Open the **Certification Authority** console.

2. Right-click the **Certificate Templates** node and click **Manage**.

3. Right-click the **Key Recovery Agent** template and click **Properties**.

4. Ensure that **Publish Certificate in Active Directory** is selected, and then click **OK**.

5. In the **Certification Authority** console, right-click the **Certificate Templates** node, click **New**, and then click **Certificate Template to Issue**.

6. Select the **Key Recovery Agent** template.

7. Add the **Certificates Snap-In**, focused to **My User Account** to a custom MMC

8. Right-click **Personal**, click **All Tasks**, and then click **Request New Certificate**.

9. Select **Key Recovery Agent**, click **Enroll**, and then click **Finish**.

10. In the **Certification Authority** console, approve the certificate request.

11. Right-click **Contoso-NYC-SVR1-CA**, and then click **Properties**.

12. On the **Recovery Agents** tab, select **Archive the key**, and then click **Add**.

13. In the **Key Recovery Agent Selection** dialog box, click **OK**. Click **Apply**.

14. When prompted to restart **Active Directory Certificate Services**, click **Yes**.

15. Click the **Issued Certificates** node. Right-click the listed certificate, click **All Tasks**, and then click **Export Binary Data**.

16. Select **Save binary data to a file**, and then click **OK**.

17. Save the file as **Recovery_Agent.cer** on the Desktop

18. In the **Certificates** console, right-click the **Personal** node, and then click **Import**.

19. Select **Recovery_Agent.cer** on the **Desktop** and then click **Open**.

Additional Reading

Introduction to Certificate Templates

- [Administering Certificate Templates](#)

Certificate Template Properties

- [Managing Certificate Templates](#)

Certificate Template Types

- [Administering Certificate Templates](#)

Certificate Template Permissions

- [Administering Certificate Templates](#)

Create New and Update Existing Templates

- [Create a New Certificate Template](#)

Key Archiving and Recovery

- [Manage Key Archival and Recovery](#)

When to Modify Certificate Templates

- [Create a New Certificate Template](#)

Lesson 3

Planning Certificate Enrollment and Revocation

Contents:

Question and Answers

Discussion: Certificate Services Deployment

Question: How can you ensure that the newly hired administrator responsible for managing the CA cannot recover everyone's EFS private keys?

Answer: Use administrative role separation to separate the CA Administrator role from the Certificate Manager role. Also ensure that the systems administrator is not configured as a Key Recovery Agent. You can even go as far as to export the KRA private certificate and put it in a safe.

Question: What steps can be taken to maximize the security of the root CA?

Answer: Use an offline root CA. These can be deployed as virtual machines on removable media, stored offline on a BitLocker encrypted drive until needed for certificate issuance.

Question: What aspects should you consider when developing or modifying the existing Computer certificate template?

Answer: As Computer templates are version one and you want to implement Suite B cryptographic algorithms, it will be necessary to use a version 3 duplicate template, suitably modified to also allow autoenrollment and key archiving.

Question: What factors should you take into account when deciding whether to use Data Recovery Agents or Key Recovery Agents?

Answer: Answers will vary depending on the organization. KRA will allow recovery of individual private certificates, which accomplishes the goal but requires more effort. DRA allows recovery of all encrypted data and hence poses a security risk.

Additional Reading

Enrollment Options

- [Basic Enrollment Process Using the Windows Server 2008 Certificate Enrollment Control](#)

Autoenrollment and Renewal

- [Configure Certificate Autoenrollment](#)

Certificate Revocation

- [Configuring Certificate Revocation](#)

- [Manage Certificate Revocation](#)

Planning for CRL Distribution Points

- [Specify CRL Distribution Points](#)

Online Certificate Status Protocol Arrays

- [Online Responder](#)

Revocation Configuration

- [Online Responder](#)

Module Reviews and Takeaways

Review questions

Question: In what situations should you deploy and Enterprise Root CA rather than a stand-alone root CA?

Answer: Organizations that only want to deploy a single CA should deploy an Enterprise Root CA. Bigger organizations can deploy more complex AD CS infrastructures.

Question: What steps do you need to take when preparing an offline root CA?

Answer: Reconfigure the CDP settings, publish CA cert and CRL, standalone root CA, not member of domain.

Question: What are the advantages of OCSP over traditional CRLs?

Answer: Minimizes bandwidth and scales well.

Question: How do you create a new certificate template?

Answer: Duplicate an existing template

What's new in Windows Server 2008 R2

- Certificate Enrollment Web Service

- Cross forest enrollment

Module 7

Planning and Provisioning Application Servers

Contents:

Lesson 1

Planning and Provisioning Web Services

Contents:

Question and Answers

Discussion: Web Services in the Organization

Question: What is your experience with delivering or managing web services in your environment? Have you encountered any challenges relating to implementing or deploying web services?

Answer: This discussion question is intended to have students share their experiences and potential issues or frustration with previous versions of IIS in Windows and how they addressed those issues. Potential issues may include web application reliability, administering web applications with unmanaged code and content, providing redundancy and consistency for web applications in a larger environment.

Detailed Demonstration Steps

Demonstration: Improving Web Services Reliability

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

▶ **Configure Application Pool recycling**

1. Switch to NYC-SVR1.

2. On NYC-SVR1, click **Start**, click **Administrative Tools**, and then click **Internet Information Services (IIS) Manager.**

3. In the **Internet Information Services (IIS) Manager** window, expand the **NYC-SVR1 (Contoso\Administrator)** node, and then click **Application Pools** in the navigation pane.

4. In the Application Pools pane, right-click **DefaultAppPool,** and then click **Recycling.**

5. In **Edit Application Pool Recycling Settings**, examine the configuration options available for Application Pool recycling settings and then click **Next**.

6. On the **Recycling Events to Log** screen, examine the available options and then click **Finish**.

7. Close the **Internet Information Services (IIS) Manager** window.

▶ **Identify IIS-related services**

1. Switch to NYC-SVR1.

2. On NYC-SVR1, right-click the Windows taskbar and then click **Start Task Manager**.

3. In the **Windows Task Manager** window, click on the **Services** tab and then click on the **Group** column header to sort by Group.

4. In the **Group** column, locate the **iissvcs** entries. Examine the two services listed, identifying them as IIS-related services (**WAS** and **W3SVC**).

5. Close the **Windows Task Manager** window.

▶ **Configure service recovery options for IIS-related services**

1. Switch to NYC-SVR1.

2. On NYC-SVR1, click **Start**, click **Administrative Tools**, and then click **Services.**

3. In the **Services** window, right-click **World Wide Web Publishing Service**, and then click **Properties.**

4. In the **World Wide Web Publishing Service Properties (Local Computer)** window, click the **Recovery** tab.

5. Identify the options available for configuring service failure recovery options for the World Wide Web Publishing Service and then click Cancel.

6. Close the **Services** window.

Lesson 2

Planning and Provisioning Presentation Virtualization

Contents:

Additional Reading

Presentation Virtualization Components

- [Remote Desktop Services](#)

Remote Desktop Services Reliability

- [Remote Desktop Connection Broker](#)

Configuring Remote Desktop Services Policies

- [Group Policy Settings for Remote Desktop Services in Windows Server 2008 R2](#)

Lesson 3

Planning and Provisioning Application Virtualization and Deployment

Contents:

Additional Reading

What Is Application Virtualization?

- [Application Virtualization](#)

Considerations for Implementing Application Virtualization

- [TechNet article, "Overview of Application Virtualization"](#)

Module Reviews and Takeaways

Review questions

Question: What benefits does a Remote Desktop Connection Broker Server provide in a presentation virtualization implementation?

Answer: The RD Connection Broker provides connection state retention and intelligent reconnection ability for multiple RD Session Host servers in a server farm. If configured, it can also act as a single, load balancing node to which presentation virtualization clients can connect to and be redirected to one or multiple RD Session Host servers in a server farm for load balancing and redundancy purposes.

Question: In a rapid-deploy situation, what advantages does presentation virtualization have over application virtualization?

Answer: Presentation virtualization infrastructure is easier to configure and is included with Windows Server 2008. Presentation virtualization implementation requires no direct modification of client computers to immediately deploy applications.

Tools

Tool	Use for	Where to find it
IIS Manager	Managing IIS	Administrative Tools
Web Deploy	Deploying IIS web applications	http://www.iis.net/download/webdeploy
WSRM	Manage resources in Windows Server 2008 applications and processes	Administrative Tools (must install first)

Lab Review Questions and Answers

Question: What other application implementation method could be used to fulfill the requirements of Exercise 1?

Answer: App-V could also fulfill the requirements of the exercise. However, more infrastructure and client management would be required than would likely be justifiable for one application.

Question: Why are IIS web applications more susceptible to errors or application failures that other application servers?

Answer: IIS web applications typically have their source code change more frequently than traditional desktop applications, which can cause problems with the application execution engine; IIS.

Question: What are the best methods available to mitigate these errors?

Answer: Application Pool Recovery and Service Recovery implementation, as configured in Exercise 3, should provide sufficient a sufficient recovery environment for most web applications.

Module 8

Planning File and Print Services

Contents:

Lesson 1

Provisioning File Services

Contents:

Question and Answers

Offline Data Access

Question: Do you enable offline access for users within your organization?

Answer: Answers will vary.

Lesson 2

Provisioning and Managing Storage

Contents:

Detailed Demonstration Steps

Demonstration: How to Use FSRM to Manage Storage

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-CL1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator**, with the password of **Pa$$w0rd**.

▶ **Install the FSRM role service.**

1. Switch to NYC-DC1.

2. On the **Taskbar**, click **Server Manager**.

3. In Server Manager, in the navigation pane, click **Roles**.

4. In the results pane, scroll down to the **File Services** section, and then click **Add Role Services**.

5. On the **Select Role Services** page, select the **File Server Resource Manager** check box, and then click **Next.**

6. On the **Configure Storage Usage Monitoring** page, in the **Volumes (NTFS volumes only):**list, select the **Allfiles (D:)** check box, and then click **Next**.

7. On the **Set Report Options** page, click **Next.**

8. On the **Confirm Installation Selections** page, click **Install**.

9. On the **Installation Results** page, click **Close**.

▶ **Configure storage quotas.**

1. On the Taskbar, click **Windows Explorer**.

2. In Windows Explorer, in the navigation pane, click **Allfiles (D:)**.

3. On the menu, click **New folder**, type **Data**, and then press Enter.

4. Click **Start**, and in the **Search** box, type **network and sharing**, and then press Enter.

5. In Network and Sharing Center, click **Change advanced sharing settings**.

6. In **Advanced sharing settings**, in the **Change sharing options for different network profiles** list, click **Turn on network discovery,** and then click **Save changes**.

7. Close Network and Sharing Center.

8. In Windows Explorer, in the results pane, right-click **Data**, and then click **Properties.**

9. In the **Data Properties** dialog box, click the **Sharing** tab.

10. Click **Advanced Sharing**.

11. In the **Advanced Sharing** dialog box, select the **Share this folder** check box.

12. Click **Permissions**, and in the **Permissions for Data** dialog box, select the **Allow Full Control** check box, and then click **OK**.

13. In the **Advanced Sharing** dialog box, click **OK**, and in the **Data Properties** dialog box, click the **Security** tab.

14. Click **Advanced**, and in the **Advanced Security Settings for Data** dialog box, click **Change Permissions**.

15. Clear the **Include inheritable permissions from this object's parent** check box, and in the **Windows Security** dialog box, click **Add**, and then click **OK**.

16. In the **Advanced Security Settings for Data** dialog box, click **OK**.

17. In the **Data Properties** dialog box, click **Edit**, and in the **Permissions for Data** dialog box, in the **Group or user names** list, click **Users (CONTOSO\Users)**.

18. In the **Permissions for Users** list, select the **Allow Full Control** check box, and then click **OK**.

19. In the **Data Properties** dialog box, click **Close**.

20. Click **Start,** point to **Administrative Tools**, and then click **File Service Resource Manager**.

21. In **File Server Resource Manager**, in the navigation pane, expand **Quota Management**, and then click **Quotas.**

22. Right-click **Quotas**, and then click **Create Quota**.

23. In the **Create Quota** dialog box, in the **Quota path** box, type **D:\Data**.

24. Click **Auto apply template and create quotas on existing and new subfolders.**

25. Under **How do you want to configure quota properties?,** in the **Derive properties from this quota template (recommended)** list, click **100 MB Limit**, and then click **Create**.

▶ Configure file screens.

1. In File Server Resource Manager, in the navigation pane, expand **File Screening Management**, and then click **File Screens**.

2. Right-click **File Screens**, and then click **Create File Screen**.

3. In the **Create File Screen** dialog box, in the **File screen path** box, type **D:\Data**.

4. Under **How do you want to configure file screen properties?,** in the **Derive properties from this file screen template (recommended)** list, click **Block Executable Files**, and then click **Create**.

5. In the navigation pane, right-click **File Server Resource Manager (Local)**, and then click **Configure Options.**

6. In the **File Server Resource Manager Options** dialog box, click the **File Screen Audit** tab.

7. Select the **Record file screening activity in the auditing database** check box, and then click **OK**.

▶ Test quotas and file screens.

1. Switch to NYC-CL1.

2. Click **Start**, and in the **Search** box, type **cmd.exe,** and press Enter.

3. At the command prompt, type the following command, and then press Enter.

```
fsutil file createnew c:\bigfile 20971520
```

4. Log off and then log on by using the following credentials:

- User name: **Adam**
- Password: **Pa$$w0rd**
- Domain: **CONTOSO**

5. Click **Start**, right-click **Computer,** and then click **Map network drive**.

6. In the **Map Network Drive** dialog box, in the **folder** box, type **\\nyc-dc1\data,** and then click **Finish**.

7. Click **Start**, and in the **Search** box, type **cmd.exe,** and press Enter.

8. At the command prompt, type the following command, and then press Enter.

```
copy c:\bigfile z:
```

9. Switch to Windows Explorer.

10. Click **bigfile**, and then press Ctrl+ C.

11. Press Ctrl+ V five times.

12. Click **Start**, and in the **Search** box, type **C:\Windows**, and then press **Enter**.

13. Right-click **notepad**, and then click **Copy**.

14. Switch to the data window. Press Ctrl+ V.

15. In the **Destination Folder Access Denied** dialog box, click **Cancel**.

▶ Generate storage reports.

1. Switch to NYC-DC1.

2. In File Server Resource Manager, in the navigation pane, click **Storage Reports Management**.

3. Right-click **Storage Reports Management**, and then click **Generate Reports** Now.

4. In the **Storage Reports Task Properties** dialog box, click **Add.**

5. In the **Browse For Folder** dialog box, expand **Allfiles (D:),** click **Data**, and then click **OK**.

6. Select the **File Screening Audit** check box, select the **Files by Owner** check box, and then click **OK**.

7. In the **Generate Storage Reports** dialog box, click **OK**.

8. Examine the File Screen Auditing Report.

9. Examine the Files by Owner Report.

10. Close all open windows.

📋   **Note**   Leave virtual machines in their current state for the subsequent demonstration.

Additional Reading

Planning File Screens

- [File Screening Management](#)

Using Reports to Manage Storage

- [Storage Reports](#)

Lesson 3

Provisioning and Managing Network Print Services

Contents:

Detailed Demonstration Steps

Demonstration: How to Publish Printers

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 virtual machine to complete this demonstration. This should still be running from the preceding demonstration.

▶ Install the Print and Document Services role.

1. Switch to NYC-DC1.

2. On the **Taskbar**, click **Server Manager**.

3. In Server Manager, in the navigation pane, click **Roles.**

4. In the results pane, click **Add Roles**.

5. In the Add Roles Wizard, click **Next**.

6. On the **Select Server Roles** page, select the **Print and Document Services** check box, and then click **Next.**

7. On the **Print and Document Services** page, click **Next**.

8. On the **Select Role Services** page, click **Next.**

9. On the **Confirm Installation Selections** page, click **Install**.

10. On the **Installation Results** page, click **Close**.

11. Close Server Manager.

▶ Share a printer.

1. Click **Start,** and then click **Devices and Printers**.

2. In Devices and Printers, click **Add a printer**.

3. In the **Add Printer** wizard, on the **What type of printer do you want to install** page, click **Add a local printer**.

4. On the **Choose a printer port** page, click **Next.**

5. On the **Install the printer driver** page, in the **Manufacturer** list, click **HP**.

6. In the **Printers** list, click **HP Color LaserJet 2700 Series PCL6**, and then click **Next.**

7. On the **Type a printer name** page, in the **Printer name** box, type **Color Laser**, and then click **Next.**

8. On the **Printer Sharing** page, click **Next.**

9. On the **You've successfully added Color Laser** page, click **Finish**.

▶ List the printer in AD DS.

1. In Devices and Printers, right-click **Color Laser**, and then click **Printer properties**.

2. In the **Color Laser Properties** dialog box, click the **Sharing** tab.

3. Select the **List in the directory** check box, and then click **OK**.

📝   **Note**   Revert all virtual machines.

Lesson 4

Migrating File and Print Services

Contents:

Question and Answers

Discussion: Why Migrate File Services to Windows Server 2008 R2?

Question: What are some of problems that the Fabrikam administrator can encounter when managing and maintaining this infrastructure?

Answer: Answers should include items such as:

- Inability to centrally manage shared file and folders, create limits, and block users from saving specific types of files.

- Lack of Integration: Windows 2000 Server and Windows Server 2003 R2 do not integrate easily with non-Windows environments.

- Inability to scale the infrastructure easily and difficulty in managing the utilization of the existing hardware to its maximum.

Discussion: Why Migrate Print Services to Windows Server 2008 R2?

Question: What are the main problems administrators can face before upgrading?

Answer: Answers will vary but may include 64-bit drivers, old printer compatibility, or migrating printer settings from Windows 2000 Server.

Question: Which tools can the administrator use to migrate printers from the old servers?

Answer: The Printer Migration Wizard and Printbrm.exe.

Question: Which new feature of Windows Server 2008 R2 Print Services will help reduce bandwith use on the company network?

Answer: Client-side rendering.

Module Reviews and Takeaways

Review questions

Question: Which File Services server role supports UNIX users?

Answer: Services for Network File System.**Question**: Why is using Public folder sharing inappropriate for many organizations?

Answer: It does not provide sufficient administrative control; for example, there are limited folder permissions available.

Question: Do you need to enable network discovery to be able to map network drives

Answer: No. Network discovery enables users to browse the network for servers and shared folders, and other resources, but you can map a network drive at any time if you know its UNC name.

Question: Why would you implement a soft quota limit?

Answer: For reporting purposes. Using soft quota limits enables you to record the storage consumed by users without imposing a hard limit. This might be an approach to consider when you first decide to implement quotas.**Question**: Which notifications can you configure for when users approach their quota thresholds?

Answer: Send e-mail notifications; log an event; run a command or script; generate storage reports.

Question: What is the benefit of using templates for file screens or quotas?

Answer: You can adjust the template and have it update the quotas based upon the template; on-going quota and file screen maintenance is consequently easier.

Tools

Tool	Use for	Where to find it
Fsutil.exe	Managing files from the command line	Command prompt
Server Manager	Adding, removing, and configuring server roles and features	Administrative Tools
Cacls.exe	Managing file system security	Command prompt
File Server Resource Manager	Managing disk quotas, file screens, and storage reports	Administrative Tools
File Server Migration Tool	Migrating files from legacy operating systems	Microsoft Download website: http://go.microsoft.com/fwlink/?LinkID=224579

Windows Server 2008 R2 Features Introduced in this Module

Windows Server 2008 R2 feature	Description
BranchCache	Provides the necessary services that enable computers in branch offices to cache downloaded files from the server

Lab Review Questions and Answers

Question: In the lab, you created a shared printer. If the Research department generated many print jobs, how would you spread the printing load?

Answer: Create a pool of printers by attaching multiple devices to the printer server and enabling printer pooling on the "printer properties".

Question: In the lab, you created a quota for the departmental data folders. If you merely wanted to report on file usage rather than impose restrictions on users, how would you go about that?

Answer: Use soft quotas for reporting-only purposes.

Module 9

Planning Network Access

Contents:

Lesson 1

Planning Network Security

Contents:

Detailed Demonstration Steps

Demonstration: How to Implement Domain Isolation

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1, 6433A-NYC-SVR1, and 6433A-NYC-CL1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

▶ **Open Group Policy Management Editor**

1. Switch to NYC-DC1.

2. Click **Start,** point to **Administrative Tools**, and then click **Active Directory Users and Computers.**

3. In Active Directory Users and Computers, expand **Contoso.com** and then click **Computers**.

4. Right-click **NYC-CL1** and then click **Move**.

5. In the **Move** dialog box, click **Research** and then click **OK**.

6. Right-click **NYC-SVR1** and then click **Move**.

7. In the **Move** dialog box, click **Research** and then click **OK**.

8. Click **Start**, point to **Administrative Tools**, and then click **Group Policy Management**.

9. In Group Policy Management, in the navigation pane, expand **Forest: Contoso.com**, expand **Domains**, expand **Contoso.com**, right-click **Research** and then click **Create a GPO in this domain, and link it here**.

10. In the **Ne GPO** dialog box, in the **Name** box, type **Domain Isolation** and then click **OK**.

11. In Group Policy Management, expand **Research**, right-click **Domain Isolation** and then click **Edit**.

12. In Group Policy Management Editor, expand **Computer Configuration**, expand **Policies**, expand **Windows Settings**, expand **Security Settings**, expand **Windows Firewall with Advanced Security**, expand **Windows Firewall with Advanced Security {GUID}**, and then click **Connection Security Rules**.

▶ **Configure the Connection Security Rule**

1. Right-click **Connection Security Rules** and then click **New Rule**.

2. In the **New Connection Security Rule Wizard**, on the **Rule Type** page, click **Isolation** and then click **Next**.

3. On the **Requirements** page, click **Require authentication for inbound connections and request authentication for outbound connections** and then click **Next**.

4. On the **Authentication Method** page, click **Computer (Kerberos V5)** and then click **Next**.

5. On the **Profile** page, clear both the **Private** and **Public** check boxes and then click **Next**.

6. On the **Name** page, in the **Name** box, type **Research Isolation** and then click **Finish**.

▶ **Refresh the GPO on all computers**

1. Switch to NYC-SVR1.

2. Restart the computer and then logon as **Contoso\Administrator** with the password **Pa$$w0rd**.

3. Click **Start**, in the **Search** box, type **cmd.exe** and then press ENTER.

4. At the Command Prompt, type **gpupdate /force** and then press ENTER.

5. Switch to NYC-CL1.

6. Restart the computer and then logon as **Contoso\Administrator** with the password **Pa$$w0rd**.

7. Click **Start**, in the **Search** box, type **cmd.exe** and then press ENTER.

8. At the Command Prompt, type **gpupdate /force** and then press ENTER.

▶ **Test domain isolation**

1. Click **Start**, and in the **Search** box, type **Windows Firewall** and then press ENTER.

2. In Windows Firewall with Advanced Security, in the navigation pane, expand **Monitoring**, expand **Security Associations**, and then click **Quick Mode**.

3. Click **Start,** and in the **Search** box, type **\\NYC-SVR1\wsuscontent** and then press ENTER.

4. Switch back to **Windows Firewall with Advanced Security**.

5. Click **Main Mode**.

Note   Revert all virtual machines.

Additional Reading

Protecting Network Traffic with IPSec

- [Determining Your IPSec Needs](#)

Lesson 3

Planning Network Access Protection

Contents:

Question and Answers

Discussion: Implementing NAP

Question: Contoso is planning to implement NAP as part of its overall security infrastructure. They want an enforcement method that will be applicable to all network clients, irrespective of how they connect. A PKI is in-place in Contoso. What enforcement method(s) would you recommend?

Answer: IPsec enforcement would be suitable, as would 802.1x enforcement depending on whether the switches and access points support 802.1x authentication. DHCP enforcement would be unsuitable because clients with a manually assigned IP configuration can bypass NAP. VPN enforcement would be unsuitable because not all clients are connecting by VPN.

Question: Tailspin Toys wants to implement IPsec NAP enforcement. What infrastructure components need to be in-place to support this method?

Answer: Aside from the general requirements for NAP, IPsec also requires the deployment of a Health Registration Authority and a PKI for health certificates.

Question: What server roles must you deploy in order to support NAP?

Answer: The Network Policy Server role and, where required, Active Directory Certificate Services (AD CS). If you are implementing DHCP enforcement, you will need to deploy a DHCP server. VPN enforcement requires the Routing and Remote Access role service (part of the NPS role).

Question: Do you envisage your organization implementing NAP? Which enforcement method would you select and why?

Answer: Answers will vary.

Module Reviews and Takeaways

Review questions

Question: What is a RADIUS client?

Answer: Wireless access points, 802.1X authenticating switches, dial-up servers, and VPN servers are examples of RADIUS clients.

Question: Why might you select IKEv2 as your preferred VPN tunneling protocol over PPTP?

Answer: IKEv2 is more secure than PPTP, and supports VPN Reconnect – which may prove especially useful for mobile users.

Question: The IT manager at your organization is concerned about opening too many firewall ports to facilitate remote access from users who are working from home through a VPN. How could you meet the expectations of your remote users while allaying your manager's concerns?

Answer: Implement SSTP as the tunneling protocol. This implements a connection by using HTTPS; this protocol relies on TCP port 443, a port that is typically already open on corporate firewalls to facilitate connections to other applications and services; for example, Outlook Web App and Web services.

Question: You have a VPN server with two configured network policies. The first has a condition that grants access to members of the Contoso group, to which everyone in your organization belongs, but has a constraint of Day and time restrictions for office hours only. The second policy had a condition of membership of the Domain Admins group and no constraints. Why are administrators being refused connections out of office hours and what can you do about it?

Answer: Administrators are also members of the Contoso group, and therefore the first policy condition is met. The second policy is not processed. The solution is either to remove the administrators from the Contoso group or else change the policy order so that the administrator policy is first in the list.

Question: On a client computer, what steps must you perform to ensure that it can be assessed for health?

Answer: Enable the NAP enforcement client. Enable the Security Center. Start the NAP agent service.

Tools

Tool	Use for	Where to find it
Services.msc	Managing Windows services	Administrative Tools, or else launch from Run
Gpedit.msc	Editing the Local Group Policy	Launch from Run
Mmc.exe	Management Console creation and management	Launch from Run
Napclcfg.msc	Manage client computer NAP enforcement settings	Launch from Run

Tool	Use for	Where to find it
Network Policy Server	Managing and creating Network Policy	Network Policy Server on the Administrative Tools menu
Netsh command-line tool	Creating administrative scripts for configuring and managing the Network Policy Server role	From a command window, type netsh –c nps to administer from a command prompt

Windows Server 2008 R2 Features Introduced in this Module

Windows Server 2008 R2 feature	Description
DirectAccess	DirectAccess is a feature in the Windows 7 and Windows Server 2008 R2 operating systems that provides users with a seamless connection to their organization's private network from a computer with an Internet connection.
VPN Reconnect	Although DirectAccess can replace VPN connections as a preferred remote access solution for many organizations, smaller organizations may not meet the infrastructure requirements for DirectAccess. Consequently, Microsoft is improving VPN usability in Windows 7 with VPN Reconnect. VPN Reconnect uses IKEv2 technology to provide seamless and consistent VPN connectivity, automatically re-establishing a VPN when users temporarily lose their Internet connections. This is particular useful for users who implement wireless broadband solutions.

Lab Review Questions and Answers

Question: In the lab, you configured the VPN server to allocate an IP address by using DHCP on the corporate network. What alternative is there?

Answer: You can use a static address pool.

Question: The DHCP NAP enforcement method is the weakest enforcement method in Microsoft Windows Server 2008 R2. What makes it less preferable than other ways?

Answer: It is less preferable because a manually assigned IP address on the client machine circumvents the DHCP NAP enforcement altogether.

Question: Could you use the remote access NAP solution alongside the IPSec NAP solution? What benefit would be realized by using such a scenario?

Answer: Yes. You can use one or all of the NAP solutions in an environment. One benefit is that the communication on the intranet also would be secured with IPSec, not just the tunnel between the Internet host and the Routing and Remote Access server.

Question: Could you have used DHCP NAP enforcement for the client? Give reasons.

Answer: No. It would not have worked, because the IP addresses assigned to the Routing and Remote Access client are coming from a static pool on the Routing and Remote Access server itself.

Module 10

Provisioning Data and Storage

Contents:

Lesson 1

Planning and Implementing Distributed File System

Contents:

Question and Answers

Considerations for Planning a DFS Namespace

Question: In your organization, would you implement a domain-based namespace or a stand-alone namespace?

Answer: Answers will vary.

DFS Data Storage Scenarios

Question: In what ways can you use DFS technologies within your organization?

Answer: Answers will vary.

Detailed Demonstration Steps

Demonstration: How to Deploy DFS

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

▶ Install the DFS role

1. Switch to NYC-DC1.

2. On the task bar, click **Server Manager**.

3. In the console pane, click **Roles**.

4. In the details pane, under **File Services**, click **Add Role Services**.

5. On the **Select Role Services** page, select the check box next to **Distributed File System**. Click **Next**.

6. On the **Create a DFS Namespace page**, select the **Create a namespace later using the DFS Management snap-in in Server Manager** option and then click **Next**.

7. On **the Confirm Installation Selections** page, click **Install**.

8. On **the Installation Results** page, click **Close**.

9. Close **Server Manager**.

10. Switch to NYC-SVR1.

11. On the task bar, click **Server Manager**.

12. In the console pane, click **Roles**.

13. In the details pane, under **File Services**, click **Add Role Services**.

14. On **the Select Role Services** page, select the check box next to **Distributed File System**. Click **Next**.

15. On the **Create a DFS Namespace** page, select the **Create a namespace later using the DFS Management snap-in in Server Manager** option and then click **Next**.

16. On the **Confirm Installation Selections** page, click **Install**.

17. On the **Installation Results** page, click **Close**.

18. Close **Server Manager**.

▶ Create a new namespace

1. Switch to NYC-SVR1.

2. Click **Start**, point to **Administrative Tools**, and then click **DFS Management**.

3. In the **DFS Management** console, in the console pane, click **Namespaces**.

4. Right-click **Namespaces** and then click **New Namespace**. The **New Namespace Wizard** starts.

5. On the **Namespace Server** page, under **Server**, type **NYC-SVR1**. Click **Next**.

6. On the **Namespace Name and Settings** page, under **Name**, type **Research**. Click **Next**.

7. On the **Namespace Type** page, ensure that **Domain-based namespace** is selected. Also, ensure that **Enable Windows Server 2008 mode** is selected and then click **Next**.

8. On the **Review Settings and Create Namespace** page, click **Create**.

9. On the **Confirmation** page, verify that the create namespace task is successful and then click **Close**.

10. In the console pane, expand the **Namespaces** node and then click **\\Contoso.com\Research**. Describe the four tabs in the details pane.

11. In the console pane, right-click **\\Contoso.com\Research**and then click **Properties**. Describe the **General**, **Referrals**, and **Advanced** tab options.

12. Click **OK** to close the **\\Contoso.com\Research Properties** dialog box.

▶ Create a new folder and folder target

1. Switch to NYC-SVR1.

2. In the DFS Management console, right-click **\\Contoso.com\Research** and then click **New Folder**.

3. In the **New Folder** dialog box, under **Name**, type **Proposals**.

4. In **New Folder** dialog box, under **Folder targets**, click **Add**.

5. In the **Add Folder Target** dialog box, type **\\NYC-SVR1\Proposal_docs** and then click **OK**.

6. In the **Warning** dialog box, click **Yes** to create the shared folder.

7. On the **Create Share** dialog box, configure the following and then click **OK**.

   - Local path of shared folder: **C:\Proposal_docs**

   - Shared folder permissions: **Administrators have full access; other users have read and write permissions**

8. In the **Warning** dialog box, click **Yes** to create the folder.

9. Click **OK** to close the New Folder dialog box.

10. In the console pane, expand **\\Contoso.com\Research**and then click **Proposals**. Explain that currently there is only one Folder Target. To provide redundancy, a second folder target can be added with DFS Replication configured. Also explain that this process would be repeated for each folder that is to be hosted within the namespace.

11. To test the namespace, click **Start**, and in the **Search programs and files** box, type **\\Contoso.com\Research**. Press ENTER. The **Proposals** folder is displayed. Close the research window.

▶ Create a new folder target for replication

1. Switch to NYC-SVR1.

2. In **DFS Management**, right-click the **Proposals** folder and then click **Add Folder Target**.

3. In the **New Folder Target** dialog box, type **\\NYC-DC1\Proposal_docs** and then click **OK**.

4. In the **Warning** dialog box, click **Yes** to create the shared folder.

5. On the **Create Share** dialog box, configure the following and then click **OK**.

   - Local path of shared folder: **C:\Proposal_docs**

- Shared folder permissions: **Administrators have full access; other users have read and write permissions**

6. In the **Warning** dialog box, click **Yes** to create the folder.

7. At the **Replication** dialog box, click **Yes** to create a replication group. The **Replicate Folder Wizard** starts.

▶ Create a new replication group

1. In the **Replicate Folder Wizard**, on the **Replication Group and Replicated Folder Name** page, accept the default entries for **Replication group name** and **Replicated folder name**. Click **Next**.

2. On the **Replication Eligibility** page, take note that NYC-DC1 and NYC-SVR1 are eligible as DFS replication members. Click **Next**.

3. On the **Primary Member** page, select **NYC-SVR1** as the primary member. Click **Next**.

4. On the **Topology Selection** page, leave the default selection of **Full mesh**, which will replicate all data between all members of the replication group. If you had three or more members within the replication group, you can also choose **Hub and spoke**, which allows you to configure a publication scenario where data is replicated from a common hub to the rest of the members. You can also choose **No topology**, which allows you to configure the topology at a later time. Click **Next**.

5. On the **Replication Group Schedule and Bandwidth** page, leave the default selection of Replicate continuously. Then, configure the setting to use Full bandwidth. Note that you can also choose a specific schedule to replicate during specified days and times. Click **Next**.

6. On the **Review Settings and Create Replication Group** page, click **Create**.

7. On the **Confirmation** page, ensure that all tasks are successful and then click **Close**. Take note of the **Replication Delay** warning and then click **OK**.

8. In the console pane, expand **Replication**.

9. Under **Replication**, click **contoso.com\research\proposals**. Click and discuss each of the tabs in the details pane.

📋 **Note**   Leave all virtual machines in their current state for the subsequent demonstration.

Additional Reading

Considerations for Planning DFS Replication

- [Introduction to DFS Replication](#)
- [Staging folders and Conflict and Deleted folders](#)
- [Distributed File System Replication: Frequently Asked Questions](#)

DFS Data Storage Scenarios

- [Overview of the Distributed File System Solution in Microsoft Windows Server 2003 R2](#)

Lesson 2

Planning and Implementing BranchCache

Contents:

Detailed Demonstration Steps

Demonstration: How to Configure BranchCache

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

▶ **Enable BranchCache on a File Server**

1. Switch to NYC-DC1.

2. Click **Start**, point to **Administrative Tools**, and click **Server Manager**.

3. In the left pane, expand **Roles** and click **File Services**.

4. If necessary, scroll down to **Role Services** and click **Add Role Services**.

5. On the **Select Role Services** page, select the **BranchCache for network files** check box and click **Next**.

6. On the **Confirm Installation Selections** page, click **Install**.

7. On the **Installation Results** page, click **Close**.

8. Close Server Manager.

9. Click **Start**, type **gpedit.msc**, and press ENTER.

10. Browse to **Computer Configuration\Administrative Templates\Network\LanmanServer** and double-click **Hash Publication for BranchCache**.

11. In the **Hash Publication for BranchCache** window, click **Enabled**.

12. In the **Options** box, select **Allow hash publication only for shared folders on which BranchCache is enabled** and then click **OK**.

13. Close the Local Group Policy Editor.

14. Open Windows Explorer from the taskbar and browse to C:\.

15. Click **New Folder**, type **Distribution,** and then press ENTER

16. Right-click **Distribution** and click **Properties**.

17. In the **Distribution Properties** window, click the **Sharing** tab and click **Advanced Sharing**.

18. In the **Advanced Sharing** window, click the check box next to **Share this folder**.

19. In the **Advanced Sharing** window, click **Caching**.

20. In the **Offline Settings** window, select the **Enable BranchCache** check box and then click **OK**. Click **OK** to close the **Advanced Sharing** window. Click **Close** to close the **Distribution Properties** dialog box.

21. Close all open windows.

Note   You can revert all virtual machines.

Lesson 3

Provisioning Storage

Contents:

Question and Answers

Considerations for Different Types of Storage

Question: In what way or ways do you currently use SAN storage in your work environment?

Answer: Answer will vary

Discussion: Implementing Storage

Question: How do you implement storage within your organization?

Answer: Answer will vary

Question: Do your servers still implement DAS?

Answer: Answer will vary

Question: Do you have any NAS or SAN-based storage?

Answer: Answer will vary

Detailed Demonstration Steps

Demonstration: How to Implement iSCSI

Detailed demonstration steps

📝 **Note**   You require the 6433A-NYC-DC1, 6433A-NYC-ISCSI, 6433A-NYC-SVR1, and 6433A-NYC-SVR2 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

📝 **Important**   Start NYC-DC1, NYC-SVR1, NYC-ISCSI, and then reconfigure NYC-SVR2 before you start it.

It is advisable to perform the preparation steps before commencing the demonstration.

▶ **Prepare the virtual machine environment**

1. On the host computer, click **Start**, point to **Administrative Tools**, and then click **Hyper-V Manager**.

2. In the Virtual Machines pane, click **6433A-NYC-DC1**, and then in the Actions pane, click **Start**.

3. To connect to the virtual machine, click **6433A-NYC-DC1**, and then in the Actions pane, click **Connect**.

4. Log on using the following credentials:

    - User name: **Administrator**

    - Password: **Pa$$w0rd**

    - Domain: **Contoso**

5. Repeat steps 2 to 4 to start the **6433A-NYC-SVR1** and **6433A-NYC-ISCSI** virtual machines.

6. In Hyper-V Manager, click **6433A-NYC-SVR2**, and in the Actions pane, click **Settings**.

7. In the **Settingsfor6433A-NYC-SVR2** dialog box, in the navigation pane, click **Network Adapter**.

8. In the Results pane, in the **Network** drop down list, click **Private Network** and then click **OK**.

9. In Hyper-V Manager, click **6433A-NYC-SVR2**, and in the Actions pane, click **Start**.

10. In the Actions pane, click **Connect**. Wait until the virtual machine starts.

11. Log on using the following credentials:

    - User name: **Administrator**

    - Password: **Pa$$w0rd**

    - Domain: **Contoso**

12. Click **Start**, and in the **Search** box, type **Network and Sharing** and then press ENTER.

13. In Network and Sharing Center, click **Change adapter settings**.

14. In **Network Connections**, right-click **Local Area Connection 2** and then click **Properties**.

15. In the **Local Area Connection 2 Properties** dialog box, double-click **Internet Protocol Version 4 (TCP/IPv4)**.

16. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box, configure the following properties and then click **OK**:

   - IP address: **10.10.0.25**

   - Subnet mask**: 255.255.0.0**

   - Default gateway: **10.10.0.1**

   - Preferred DNS server: **10.10.0.10**

17. In the **Local Area Connection 2 Properties** dialog box, click **OK**. Close the Network Connections window.

▶ **Create an iSCSI Target**

1. Switch to **NYC-ISCSI**.

2. Click **Start**, point to **Administrative Tools**, and then click **Microsoft iSCSI Software Target**.

3. In the tree pane of the iSCSITarget – [Microsoft iSCSI Software Target\Devices] console, right-click **iSCSI Targets**, and then click **Create iSCSI Target**.

4. On the **Welcome to the Create iSCSI Target Wizard** page, click **Next**.

5. In the **iSCSI target name** box of the **iSCSI Target Identification** page, type **LUN-01**, and then click **Next**.

6. On the **iSCSI Initiators Identifiers** page, click **Advanced**.

7. In the **Advanced Identifiers**dialog box, click **Add**.

8. In the **Identifier Type** box of the **Add/Edit Identifier** dialog box, click **IP Address**, in the **Value** box, type **10.10.0.24**, and then click **OK**.

9. In the **Advanced Identifiers**dialog box, click **Add**.

10. In the **Identifier Type** box of the **Add/Edit Identifier** dialog box, click **IP Address**, in the **Value** box, type **10.10.0.25**, and then click **OK**.

11. In the **Advanced Identifiers**dialog box, click **OK**.

12. On the **iSCSI Initiators Identifiers** page, ensure that the **IQN Identifier** box displays the text Click **Advanced button to view alternate identifiers**, and then click **Next**.

13. On the **Completing the Create iSCSI Target Wizard** page, click **Finish**.

▶ **Create Virtual Disks**

1. In the tree pane of the iSCSITarget – [Microsoft iSCSI Software Target\Devices] console, under **iSCSI Targets**, right-click **Devices**, and then click **Create Virtual Disk**.

2. On the **Welcome to the Create Virtual Disk Wizard** page, click **Next**.

3. In the **File** box of the **File** page, type **C:\Disks\Disk-01.vhd**, and then click **Next**.

4. In the **Size of virtual disk (MB)** box of the **Size** page, type **8000**, and then click **Next**.

5. On the **Description** page, click **Next**.

6. On the **Access** page, click **Add**.

7. In the **Add Target**dialog box, in the **Target Name** list, click **LUN-01**, and then click **OK**.

8. On the **Access** page, click **Next**.

9. On the **Completing the Create Virtual Disk Wizard** page, click **Finish**.

10. In the tree pane of the iSCSITarget – [Microsoft iSCSI Software Target\Devices] console, under **iSCSI Targets**, right-click **Devices**, and then click **Create Virtual Disk**.

11. On the **Welcome to the Create Virtual Disk Wizard** click **Next**.

12. In the **File** box of the **File** page, type **C:\Disks\Disk-02.vhd**, and then click **Next**.

13. In the **Size of virtual disk (MB)** box of the **Size** page, type **20000**, and then click **Next**.

14. On the **Description** page, click **Next**.

15. On the **Access** page, click **Add**.

16. In the **Add Target**dialog box, in the **Target Name** list, click **LUN-01**, and then click **OK**.

17. On the **Access** page, click **Next**.

18. On the **Completing the Create Virtual Disk Wizard** page, click **Finish**.

▶ Configure Firewall Rules to enable iSCSI communications

1. To open the proper ports on Windows Firewall in order to allow iSCSI communication from clients to the server, open a command prompt and enter the following commands, and press ENTER after each command:

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-TCP-
3260" dir=in action=allow protocol=TCP localport=3260
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-TCP-135"
dir=in action=allow protocol=TCP localport=135
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-UDP-138"
dir=in action=allow protocol=UDP localport=138
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service" dir=in
action=allow program="%SystemRoot%\System32\WinTarget.exe" enable=yes
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service Status
Proxy" dir=in action=allow program="%SystemRoot%\System32\WTStatusProxy.exe" enable=yes
```

▶ Configure the iSCSI target software on NYC-SVR1

1. Switch to **NYC-SVR1**.

2. Click **Start**, point to **Administrative Tools**, and then click **iSCSI Initiator**.

3. In the **Microsoft iSCSI** dialog box, click **Yes**.

4. On the **Targets** tab of the **iSCSI Initiator Properties** dialog box, in the **Target** box, type **10.10.0.30**, and then click **Quick Connect**.

5. In the **Quick Connect** dialog box, ensure that the status of **iqn.1991-05.com.microsoft:NYC-ISCSI-lun-01-target** is **Connected**, and then click **Done**.

6. On the **Volumes and Devices** tab, click **Auto Configure**. Verify that two volumes are added to the Volume List.

7. In the **iSCSI Initiator Properties** dialog box, click **OK**.

▶ Configure storage

1. On NYC-SVR1, open Server Manager.

2. In the tree pane of the Server Manager console, expand **Storage**, and then click **Disk Management**.

3. Right-click **Disk 3**, and then click **Online**.

4. Right-click **Disk 4**, and then click **Online**.

5. Right-click **Disk 3**, and then click **Initialize Disk**. Verify that both **Disk 3** and **Disk 4** are selected, and then click **OK**.

6. In the Disk Management result pane, right-click the **7.81 GB Unallocated** area beside either **Disk 3** or **Disk 4**, and then click **New Simple Volume**.

7. On the **Welcome to the New Simple Volume Wizard** page, click **Next**.

8. On the **Specify Volume Size** page, click **Next**.

9. On the **Assign Drive Letter or Path** page, beside **Assign the following drive letter**, click **Q**, and then click **Next**.

10. On the **Format Partition** page, in the **Volume label** box, type **Witness Disk**, and then click **Next**.

11. On the **Completing the New Simple Volume Wizard** page, click **Finish**.

12. Click **Finish**.

13. In the Disk Management result pane, right-click the **19.53 GB Unallocated** area beside either **Disk 3** or **Disk 4**, and then click **New Simple Volume**.

14. On the **Welcome to the New Simple Volume Wizard page**, click **Next**.

15. On the **Specify Volume Size** page, click **Next**.

16. On the **Assign Drive Letter or Path** page, beside **Assign the following drive letter**, click **M**, and then click **Next**.

17. On the **Format Partition** page, in the **Volume label** box, type **VM Storage**, and then click **Next**.

18. On the **Completing the New Simple Volume Wizard page**, click **Finish**.

Additional Reading

What Is Microsoft iSCSI?

- [Microsoft iSCSI Software Target 3.3](#)

Module Reviews and Takeaways

Review questions

Question: Why is using Public folder sharing inappropriate for many organizations?

Answer: It does not provide sufficient administrative control; for example, there are limited folder permissions available.

Question: Do you need to enable network discovery to be able to map network drives?

Answer: No. Network discovery enables users to browse the network for servers and shared folders and other resources, but you can map a network drive at any time if you know its UNC name.

Question: What are the primary benefits of a SAN over DAS?

Answer: Highly effective resource sharing; better storage utilization; hardware consolidation and availability.

Question: What is the primary advantage of a domain-based DFS namespace?

Answer: Fault tolerance of the namespace can be provided without the need to implement clustering of the file services role.

Question: How can fault tolerance of the content in a DFS namespace be provided?

Answer: By adding multiple namespace targets and configuring replication.

Question: How does BranchCache differ from DFS?

Answer: BranchCache only caches files that users in a remote location have accessed. DFS replicates files between head office and a remote location so that all files exist in both locations.

Question: Why would you want to implement BranchCache in hosted cache mode rather than distributed cache mode?

Answer: When the distributed cache mode is used, the cache is distributed among all Windows 7 computers. However, it is likely that Windows 7 computers will be turned off or laptop computers will be removed from the office. This means that a cached file might not be available, forcing the file to be downloaded across the WAN link again. Hosted cache mode keeps the cached files on a file server that will always be available.

Windows Server 2008 R2 Features Introduced in This Module

Windows Server 2008 R2 feature	Description
Read-only replicated folders	Ability to configure read-only replicated folders from the DFS Management console
Failover cluster support	Failover cluster support for DFS
BranchCache	A feature in Windows Server 2008 R2 and Windows 7 that reduces the network utilization on WAN connections between branch offices and headquarters by locally caching frequently used files on computers in the branch office
Microsoft iSCSI Software	Microsoft iSCSI Software Target provides for software-based and hardware-

Windows Server 2008 R2 feature	Description
Target 3.3	independent iSCSI disk subsystems in SANs

Tools

Tool	Use for	Where to find it
Dfsutil	Performing advanced operations on DFS namespaces	On a namespace server, type Dfsutil at the command prompt.
Dfsdiag	Configure and monitor DFS	On a namespace server, type Dfsdiagat the command prompt.
Dfsrdiag	Monitoring replication	On a namespace server, type Dfsrdiag at the command prompt.
Dfscmd.exe	Scripting basic DFS tasks such as configuring DFS roots and targets	On a namespace server, type Dfscmd at the command prompt.
DFS Management	Performing tasks related to DFS namespaces and replication	Click Start, point to Administrative Tools, and then click DFS Management.
Netsh	Configuring network settings, including those relevant for BranchCache, and displaying BranchCache status	Command-line
File Server Resource Manager	Configure file screening, quotas, file classification, and file management	Administrative Tools

Lab Review Questions and Answers

Question: In the lab, you were only able to configure DFS replication for a full mesh topology. Why?

Answer: There are only two servers. You require more servers in a replication group to select an alternative model.

Question: In the lab, you moved the client computers into an organizational when configuring BranchCache. Why?

Answer: BranchCache client setting can be configured by using GPO, as was the case in the lab. The GPO was linked to a specific OU into which you moved the computer accounts.

Module 11

Planning Update Deployment

Contents:

Lesson 1
WSUS Topologies

Contents:

Detailed Demonstration Steps

Demonstration: WSUS Groups

Detailed demonstration steps

> **Note**　You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator** with the password of **Pa$$w0rd**.

1. Switch to NYC-SVR1 and open the Windows Server Update Services console from the Administrative Tools menu.

2. Expand the **NYC-SVR1\Computers** node and then click **All Computers**.

3. In the **Actions** menu, click on **Add Computer Group**.

4. In the **Add Computer Group** dialog box, in the **Name** field, type**Update_Testing** and then click **Add**.

5. Ensure that the **NYC-SVR1\Computers** node is still selected. In the **Actions** menu, click **Add Computer Group**.

6. In the **Add Computer Group** dialog box, in the **Name** field, type**Australia** and click **Add**.

7. Expand **All Computers**, and then click on the **Australia** computer group. In the Actions pane, click **Add Computer Group**.

8. In the **Add Computer Group** dialog box, in the **Name** field, type**Melbourne_Sales** and then click **Add**.

9. Repeat steps 7 and 8 and create the computer group **Melbourne_Marketing**.

In this demonstration, you will configure a GPO that will assign a computer to a specific WSUS computer group.

1. Switch to NYC-DC1.

2. From the Administrative Tools menu, open the **Group Policy Management** console.

3. Navigate to the **Forest: Contoso.com\Domains\Contoso.com\Group Policy Objects** node.

4. From the Action menu, click on **New**. In the **New GPO** dialog box, enter the name **WSUS_Policy** and then click **OK**.

5. Right click on **WSUS_Policy** and then click **Edit**.

6. Navigate to the **Computer Configuration\Policies\Administrative Templates\Windows Components\Windows Update** node and then double click on **Enable client-side targeting.**

7. In the **Enable client-side targeting** policy, set the policy to **Enabled** and set the **Target group name for this computer** to **Melbourne_Marketing**. Click **OK**.

Additional Reading

Importance of an Appropriate WSUS Topology

- [Design the WSUS 3.0 SP2 Deployment](#)

Deploying WSUS

- [Install the WSUS 3.0 SP2 Server](#)

Replica Configuration

- [Create Replica Servers](#)

WSUS on Disconnected Networks

- [Set Up a Disconnected Network (Import and Export the Updates)](#)

Optimizing WSUS Administration

- [Best Practices with Windows Server Update Services 3.0](#)

Lesson 2

Update Management

Contents:

Question and Answers

Discussion: WSUS, System Center Essentials, or System Center Configuration Manager

Question: Which update management solution would be most appropriate for this organization?

Answer: With less than 400 client computers, 25 servers and a need to deploy both Microsoft and 3rd party updates, you will need to deploy either System Center Essentials or System Center Configuration Manager, with System Center Essentials being cheaper to license in most scenarios and less complex to deploy. Discuss which factors might push the decision in favor of System Center Essentials or System Center Configuration Manager.

Question: Which update management solution would be most appropriate for this organization and how should that update management solution be deployed?

Answer: Answers may vary, but the key points are that without any deployed 3rd party applications you should consider deploying WSUS unless other features of System Center Essentials or System Center Configuration manager are necessary.

Question: Which update management solution would be most appropriate for this organization and how should that update management solution be deployed?

Answer: Only System Center Configuration Manager supports Wake On LAN functionality, scheduled update deployment, and deployment of updates for 3rd party applications. You can place System Center Configuration Manager deployment points at each site in your organization to make the deployment of updates more efficient.

Detailed Demonstration Steps

Demonstration: Automatic Approval Rule

Detailed demonstration steps

📋 **Note** You require the 6433A-NYC-DC1 and 6433A-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as Contoso\Administrator with the password of Pa$$word.

This demonstration assumes that you have created the computer groups Update_Testing, Australia, Melbourne_Marketing and Melbourne_Sales during the demonstration in Lesson 1.

1. On NYC-SVR1, open the Windows Server Update Services console from the **Administrative Tools** menu.

2. Click the **Options** node and then click **Automatic Approvals**.

3. Review the properties of the Default Automatic Approval Rule.

4. Click **New Rule**. On the **Add Rule** dialog box, select the **When an update is in a specific classification**, **When an update is in a specific product**, and **Set a deadline for the approval** checkboxes.

5. Click the underlined all computers text and then ensure that only the **Update_Testing** group is selected.

6. Click the **7 days after the approval at 3:00am text** link. In the **Choose Deadline** dialog box, change the update approval deadline to **1** day and then click **OK**.

7. In the **Specify a name** box, type **Automatic_To_Test_Computers** and then click **OK**.

8. In the **New Rule**. In the **Add Rule** dialog box, select the **When an update is in a specific classification**, **When an update is in a specific product**, and **Set a deadline for the approval** checkboxes.

9. Click the underlined any classification text and then ensure that only Critical Updates and Security Updates are selected and click **OK**.

10. Click the **7 days after the approval at 3:00am text**. In the **Choose Deadline** dialog box, change the update approval deadline to **10** days and then click **OK**.

11. Click the underlined all computers text and ensure that only the **Melbourne_Marketing** group is selected and click **OK**.

12. In the Specify a name textbox, enter Melbourne_Marketing_Security_Critical and then click **OK**.

13. Click the **Advanced** tab. Discuss the following settings:

    - **Automatically Approve Updates To The WSUS Product Itself**

    - **Automatically Approve New Revisions Of Updates That Area Already Approved**

    - **Automatically Decline Updates When A New Revision Causes Them To Expire**

📋 **Note**   Revert the virtual machines.

Additional Reading

Update Management: More Than Deploying Updates

- [Verify Deployment of Updates](#)

Deploying Updates

- [Security update bulletins](#)

Verifying Update Deployment

- [Verify Deployment of Updates](#)

- [Microsoft Baseline Security Analyzer 2.2](#)

- [Get-Hotfix](#)

WSUS Reporting

- [Creating Reports](#)

Advanced Update Management Technologies

- [System Center Essentials Frequently Asked Questions](#)

- [About Update Management in Essentials](#)

Module Reviews and Takeaways

Review questions

Question: What are the risks involved in using automatic approval rules?

Answer: The main risk in using automatic approval rules is that you will automatically approve an update that conflicts with software used in your environment.

Question: In what situations is it better to plan to use an upstream server as the source of a WSUS server's update files than using Microsoft Update?

Answer: When you've got a good connection to the upstream server and it makes more sense to source those updates over a link rather than to pull them directly over the Internet.

Question: Under which circumstances are you able to use BranchCache to mitigate the need for deploying a branch office WSUS server?

Answer: You can use BranchCache when all branch office computers are running the Windows 7 Enterprise or Windows 7 Ultimate editions. You can also use Hosted-Cache mode if there is a server on the local branch network running Windows Server 2008 R2.

Question: Which types of computers should you include in a test group?

Answer: You should include computers that reflect common configurations. It is better to use a test group that has live computers as you are more likely to find conflicts if the computers are being used for everyday tasks than just if an administrator spends half an hour ensuring that no obvious errors have occurred.

Best Practices Related to Windows Server Update Services Deployment

Supplement or modify the following best practices for your own work situations:

- Remember to configure replicas at branch office sites when you need a local WSUS server, but do not have local administrators.

- As your organization moves towards operating systems such as Windows 7 and Windows Server 2008 R2, you can consider retiring local branch office WSUS servers in favor of using BranchCache.

- Larger organizations should deploy System Center Configuration Manager 2007 R3 for update management rather than relying on WSUS.

Module 12

Planning High Availability

Contents:

Lesson 1

Planning Network Load Balancing

Contents:

Question and Answers

Discussion: Considerations for Network Load Balancing

Question: In your network, what services might benefit from NLB?

Answer: Answers will vary, but may include Exchange Server Client Access Server role and front-end web servers

Question: Do you have any servers hosting stateless information that would benefit from NLB in your environment?

Answer: Answers will vary.

Detailed Demonstration Steps

Demonstration: How to Implement Network Load Balancing

Detailed demonstration steps

📋 **Note**   You require the 6433A-NYC-DC1, 6433A-NYC-SVR1, and 6433A-NYC-SVR2 virtual machines to complete this demonstration. Log on to the virtual machines as **Contoso\Administrator**, with the password,**Pa$$w0rd**.

📋 **Important**   Start NYC-DC1, NYC-SVR1, and then reconfigure NYC-SVR2 before you start it.

▶ **Prepare the virtual machine environment.**

1. On the host computer, click **Start**, point to **AdministrativeTools**, and then click **Hyper-VManager**.

2. In the Virtual Machines pane, click **6433A**-**NYC**-**DC1**, and then in the Actions pane, click **Start**.

3. To connect to the virtual machine, click **6433A**-**NYC**-**DC1**, and then in the Actions pane, click **Connect**.

4. Log on by using the following credentials:

    - User name: **Administrator**

    - Password: **Pa$$w0rd**

    - Domain: **Contoso**

5. Repeat steps 2 to 4 to start the **6433A-NYC-SVR1** virtual machine.

6. In Hyper-V™ Manager, click **6433A-NYC-SVR2**, and in the Actions pane, click **Settings**.

7. In the **Settings for 6433A-NYC-SVR2** dialog box, in the navigation pane, click **Network Adapter**.

8. In the Results pane, in the **Network**drop-down list, click **Private Network**, and then click **OK**.

9. In Hyper-V™ Manager, click **6433A-NYC-SVR2**, and in the Actions pane, click **Start**.

10. In the Actions pane, click **Start**. Wait until the virtual machine starts.

11. Log on by using the following credentials:

    - User name: **Administrator**

    - Password: **Pa$$w0rd**

    - Domain: **Contoso**

12. Click **Start**, and in the **Search** box, type **Network and Sharing**,and then press Enter.

13. In Network and Sharing Center, click **Change adapter settings**.

14. In **Network Connections**, right-click **Local Area Connection 2**,and then click **Properties**.

15. In the **Local Area Connection 2 Properties** dialog box, double-click **Internet Protocol Version 4 (TCP/IPv4)**.

16. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box, configure the following properties, and then click **OK**:

- IP address: **10.10.0.25**

- Subnet mask: **255.255.0.0**

- Default gateway: **10.10.0.1**

- Preferred DNS server: **10.10.0.10**

17. In the **Local Area Connection 2 Properties** dialog box, click **OK**.

18. Close the Network Connections window.

▶ Install the Network Load Balancing feature.

1. On NYC-SVR1, click **Start**, point to **Administrative Tools**, and then click **Server Manager**.

2. In the navigation pane, click **Features**. In the results pane, click Add Features, and in the **Add Features Wizard**, select the **Network Load Balancing** check box. Click **Next**, click **Install**, and then click **Close**.

3. On NYC-SVR2, click **Start**, point to **Administrative Tools**, and then click **Server Manager**.

4. In the navigation pane, click **Features**. In the results pane, click Add Features, and in the **Add Features Wizard**, select the **Network Load Balancing** check box. Click **Next**, click **Install**, and then click **Close**.

5. Switch back to NYC-SVR1.

6. Click **Start**, click **Administrative Tools**, and then click **Network Load Balancing Manager**. You can also open the Network Load Balancing Manager by typing **Nlbmgr** at a command prompt.

7. Right-click **Network Load Balancing Clusters**, and then click **New Cluster**.

8. To connect to the host that is to be a part of the new cluster, in the **Host** text box, type the name of the host, **NYC-SVR1**, and then click **Connect**.

9. Select the interface that you want to use with the cluster, **Local Area Network 2**, and then click **Next**. (The interface hosts the virtual IP address and receives the client traffic to load balance.)

10. In **New Cluster : Host Parameters**, select a value in **Priority (Unique host identifier)**. This parameter specifies a unique ID for each host. The host with the lowest numerical priority among the current members of the cluster handles all of the cluster's network traffic that is not covered by a port rule. Accept the default value of **1**.

11. Click **Next** to continue.

12. In **New Cluster : Cluster IP Addresses**, click **Add** and type the cluster IP address that is shared by every host in the cluster. NLB adds this IP address to the TCP/IP stack on the selected interface of all hosts that are chosen to be part of the cluster. Note that NLB does not support Dynamic Host Configuration Protocol (DHCP). NLB disables DHCP on each interface that it configures, so the IP addresses must be static. Enter **10.10.0.30**, with a subnet mask of **255.255.0.0**, and then click **OK**.

13. Click **Next** to continue.

14. In **New Cluster : Cluster Parameters**, type the Full Internet name that users will use to access this NLB cluster. You can type **contoso-NLB.contoso.com**.

15. Under **Cluster operation mode**, click **Unicast** to specify that a unicast Media Access Control (MAC) address should be used for cluster operations. In unicast mode, the MAC address of the cluster is assigned to the network adapter of the computer, and the built-in MAC address of the network adapter is not used. We recommend that you accept the unicast default settings.

16. Click **Next** to continue.

17. In **New Cluster : Port Rules**, click **Finish**.

▶ **Add a second host to the cluster.**

1. In Network Load Balancing Manager, expand **Network Load Balancing Clusters**, right-click **Contoso-NLB.contoso.com (10.10.0.30)**, and then click **Add Host toCluster**.

2. In **Add Host to Cluster : Connect**, in the **Host** box, type **NYC-SVR2**, and then click **Connect**.

3. Click Next to continue.

4. In **Add Host to Cluster :** Host Parameters, click **Next**.

5. In the **Add Host to Cluster : Port Rules**, click **Finish**.

📋 **Important**   Leave the virtual machines running. After you have completed the demonstration, remove the two nodes from the cluster.

6. In Network Load Balancing Manager, right-click **NYC-SVR1 (Local Area Connection 2)**, and then click **Delete Host**.

7. In the **Network Load Balancing Manager** dialog box, click **Yes**.

8. Repeat for **NYC-SVR2 (Local Area Connection 2).**

9. Right-click **Contoso-NLB.contoso.com (10.10.0.100)**, and then click **Delete Cluster**.

10. In the **Network Load Balancing Manager** dialog box, click **Yes**.

11. Close all open windows.

Lesson 2

Planning Failover Clustering

Contents:

Detailed Demonstration Steps

Demonstration: How to Configure Failover Clustering

Detailed demonstration steps

📝 **Note**   You require the 6433A-NYC-DC1, 6433A-NYC-ISCSI, 6433A-NYC-SVR1, and 6433A-NYC-SVR2 virtual machines to complete this demonstration. With the exception of NYC-ISCSI, these should be running from the previous demonstration. Start NYC-ISCSI now.

It is advisable to perform the preparation steps before commencing the demonstration.

▶ **Prepare the virtual machine environment.**

1. Switch to **NYC-ISCSI**.

2. Click **Start**, point to **AdministrativeTools**, and then click **Microsoft iSCSI Software Target**.

3. In the tree pane of the iSCSITarget – [Microsoft iSCSI Software Target\Devices] console, right-click **iSCSI Targets**, and then click **Create iSCSI Target**.

4. On the **Welcome to the Create iSCSI Target Wizard** page, click **Next**.

5. In the **iSCSI target name** box of the **iSCSI Target Identification** page, type **LUN-01**, and then click **Next**.

6. On the **iSCSI Initiators Identifiers** page, click **Advanced**.

7. In the **Advanced Identifiers** dialog box, click **Add**.

8. In the **Identifier Type** box of the **Add/Edit Identifier** dialog box, click **IP Address**, in the Value box, type **10.10.0.24**, and then click **OK**.

9. In the **Advanced Identifiers** dialog box, click **Add**.

10. In the **Identifier Type** box of the **Add/Edit Identifier** dialog box, click **IP Address**, in the Value box, type **10.10.0.25**, and then click **OK**.

11. In the **Advanced Identifiers** dialog box, click **OK**.

12. On the **iSCSI Initiators Identifiers** page, ensure that the **IQN Identifier** box displays the text **Click Advanced button to view alternate identifiers**, and then click **Next**.

13. On the **Completing the Create iSCSI Target Wizard** page, click **Finish**.

14. In the tree pane of the iSCSI Target – [Microsoft iSCSI Software Target\Devices] console, under **iSCSI Targets**, right-click **Devices**, and then click **Create Virtual Disk**.

15. On the **Welcome to the Create Virtual Disk Wizard** page, click **Next**.

16. In the **File** box of the **File** page, type **C:\Disks\Disk-01.vhd**, and then click **Next**.

17. In the **Size of virtual disk (MB)** box of the **Size** page, type **8000**, and then click **Next**.

18. On the **Description** page, click **Next**.

19. On the **Access** page, click **Add**.

20. In the **Add Target** dialog box, in the **Target Name** list, click **LUN-01**, and then click **OK**.

21. On the **Access** page, click **Next**.

22. On the **Completing the Create Virtual Disk Wizard** page, click **Finish**.

23. In the tree pane of the iSCSI Target – [Microsoft iSCSI Software Target\Devices] console, under **iSCSI Targets**, right-click **Devices**, and then click **Create Virtual Disk**.

24. On the **Welcome to the Create Virtual Disk Wizard** click **Next**.

25. In the **File** box of the **File** page, type **C:\Disks\Disk-02.vhd**, and then click **Next**.

26. In the **Size of virtual disk (MB)** box of the **Size** page, type **20000**, and then click **Next**.

27. On the **Description** page, click **Next**.

28. On the **Access** page, click **Add**.

29. In the **Add Target** dialog box, in the **Target Name** list, click **LUN-01**, and then click **OK**.

30. On the **Access** page, click **Next**.

31. On the **Completing the Create Virtual Disk Wizard** page, click **Finish**.

32. To open the proper ports on Windows Firewall to allow iSCSI communication from clients to the server, open a command prompt, enter the following commands, and press Enter after each command.

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-TCP-
3260" dir=in action=allow protocol=TCP localport=3260
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-TCP-135"
dir=in action=allow protocol=TCP localport=135
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service-UDP-138"
dir=in action=allow protocol=UDP localport=138
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service" dir=in
action=allow program="%SystemRoot%\System32\WinTarget.exe" enable=yes
```

```
netsh advfirewall firewall add rule name="Microsoft iSCSI Software Target Service Status
Proxy" dir=in action=allow program="%SystemRoot%\System32\WTStatusProxy.exe" enable=yes
```

33. Close all open windows.

▶ **Configure the iSCSI target software on NYC-SVR1.**

1. Switch to **NYC-SVR1**.

2. Click **Start**, point to **Administrative Tools**, and then click **iSCSI Initiator**.

3. In the **Microsoft iSCSI** dialog box, click **Yes**.

4. On the **Targets** tab of the **iSCSI Initiator Properties** dialog box, in the **Target** box, type **10.10.0.30**, and then click **Quick Connect**.

5. In the **Quick Connect** dialog box, ensure that the status of **iqn.1991-05.com.microsoft:NYC-ISCSI-lun-01-target is Connected**, and then click **Done**.

6. On the **Volumes and Devices** tab, click **Auto Configure**. Verify that two volumes are added to the Volume List.

7. In the **iSCSI Initiator Properties** dialog box, click **OK**.

▶ Configure the iSCSI target software on NYC-SVR2.

1. Switch to **NYC-SVR2**.

2. Click **Start**, point to **Administrative Tools**, and then click **iSCSI Initiator**.

3. In the **Microsoft iSCSI** dialog box, click **Yes**.

4. On the **Targets** tab of the **iSCSI Initiator Properties** dialog box, in the **Target** box, type **10.10.0.30**, and then click **Quick Connect**.

5. In the **Quick Connect** dialog box, ensure that the status of **iqn.1991-05.com.microsoft:NYC-ISCSI-lun-01-target is Connected**, and then click **Done**.

6. On the **Volumes and Devices** tab, click **Auto Configure**. Verify that two volumes are added to the Volume List.

7. In the **iSCSI Initiator Properties** dialog box, click **OK**.

▶ Configure the shared disks.

1. On NYC-SVR1, open Server Manager.

2. In the tree pane of the Server Manager console, expand **Storage**, and then click **Disk Management**.

3. Right-click **Disk 3**, and then click **Online**.

4. Right-click **Disk 4**, and then click **Online**.

5. Right-click **Disk 3**, and then click **Initialize Disk**. Verify that both **Disk 3** and **Disk 4** are selected, and then click **OK**.

6. In the Disk Management result pane, right-click the **7.81 GB Unallocated** area next to either **Disk 3** or **Disk 4**, and then click **New Simple Volume**.

7. On the **Welcome to the New Simple Volume Wizard** page, click **Next**.

8. On the **Specify Volume Size** page, click **Next**.

9. On the **Assign Drive Letter or Path** page, next to **Assign the following drive letter**, click **Q**, and then click **Next**.

10. On the **Format Partition** page, in the **Volume label** box, type **Witness Disk**, and then click **Next**.

11. On the **Completing the New Simple Volume Wizard** page, click **Finish**.

12. In the Disk Management result pane, right-click the **19.53 GB Unallocated** area next to either **Disk 3** or **Disk 4**, and then click **New Simple Volume**.

13. On the **Welcome to the New Simple Volume Wizard** page, click **Next**.

14. On the **Specify Volume Size** page, click **Next**.

15. On the **Assign Drive Letter or Path** page, next to **Assign the following drive letter**, click **M**, and then click **Next**.

16. On the **Format Partition** page, in the **Volume label** box, type **VM Storage**, and then click **Next**.

17. On the **Completing the New Simple Volume Wizard** page, click **Finish**.

▶ **Install the Failover Clustering Feature.**

1. In Server Manager, in the tree pane of the Server Manager console, right-click **Features**, and then click **Add Features**.

2. On the **Select Features** page of the Add Features Wizard, under **Features**, select the **Failover Clustering** check box, and then click **Next**.

3. On the **Confirm Installation Selections** page, click **Install**.

4. On the **Installation Results** page, click **Close**.

5. Switch to NYC-SVR2, and then open Server Manager.

6. In Server Manager, in the tree pane of the Server Manager console, right-click **Features**, and then click **Add Features**.

7. On the **Select Features** page of the Add Features Wizard, under **Features**, select the **Failover Clustering** check box, and then click **Next**.

8. On the **Confirm Installation Selections** page, click **Install**.

9. On the **Installation Results** page, click **Close**.

10. Close Server Manager.

▶ **Validate the failover cluster.**

1. On NYC-SVR1, click **Start**, point to **Administrative Tools**, and then click **Failover Cluster Management**.

2. In the Actions pane of the Failover Cluster Manager console, click **Validate a Configuration**.

3. On the **Before You Begin** page, click **Next**.

4. In the **Enter name** box of the **Select Servers or a Cluster** page, type **NYC-SVR1**, and then click **Add**.

5. Type **NYC-SVR2**, click **Add**, and then click **Next**.

6. On the **Testing Options** page, click **Next**.

7. On the **Confirmation** page, click **Next**.

8. Wait for the validation to complete (this will be several minutes), and then click **View Report**. Verify that no errors are reported, and then close Microsoft Internet Explorer®.

9. On the **Summary** page, click **Finish**.

▶ **Use the Create Cluster Wizard to build a simple failover cluster.**

1. On NYC-SVR1, in **Failover Cluster Management**, in the **Management** section of the center pane, select **Create a Cluster**.

2. In the Actions pane of the Failover Cluster Manager console, click **Create a Cluster**.

3. On the **Before You Begin** page, click **Next**.

4. In the **Enter server name** box of the **Select Servers or a Cluster** page, type **NYC-SVR1**, and then click **Add**.

5.   Type **NYC-SVR2**, click **Add**, and then **Next**.

6.   In the **Cluster Name** box, type **NYC-FS-Cluster**, in the **Address** box, type **10.10.0.90**, and then click **Next**.

7.   On the **Confirmation** page, click **Next**.

8.   On the **Summary** page, click **View Report**. Scroll to the lowermost part of the report, and verify that the cluster was created by using Node and Disk Majority quorum configuration. Close Internet Explorer.

9.   On the **Summary** page, click **Finish**.

Close all open windows.

Note   Revert all virtual machines.

Additional Reading

Clustering Requirements

- [Windows Storage Server 2008 R2](#)

- [Windows Server catalog](#)

- [Edition Comparison by Technical Specification](#)

Lesson 3

Planning for Service Availability

Contents:

Question and Answers

Discussion: What Is Service Redundancy?

Question Are there situations in which NLB and failover clustering cannot provide complete protection against service failure?

Answer: Answers will vary, but might include loss of a data center, corruption of data on storage medium, and misconfiguration leading to service failure.

Question: Aside from NLB and failover clustering, how else might you provide for service availability?

Answer: Answers will vary, but the point here is to get students to think about the services they already understand and consider how to provide availability for them. For example, it may not be necessary to cluster your AD DS domain controllers becauseyou can simply implement additional controllers and rely on AD DS replication. In addition, implementing multiple DHCP scopes on multiple DHCP servers, using the 80/20 rule, can provide sufficient resilience.

Discussion: Network Infrastructure Availability

Question: Discussion: Network Infrastructure Availability

Answer:

Deploy multiple domain controllers.

Ensure that each physical location is provided with at least one domain controller.

Many services require access to global catalog servers. Consider making more domain controllers global catalog servers.

Question: How will you provide for DNS service availability?

Answer:

Deploy additional DNS servers; you should provide at least two DNS servers for each DNS zone.

You should also ensure that each physical location is served by two or more DNS servers.

Consider implementing AD-integrated DNS zones. Install the DNS server role on all domain controllers; this ensures that the zone information is propagated among DNS servers with AD DS replication.

Question: How will you provide for DHCP service availability?

Answer: Consider implementing multiple DHCP servers in your network infrastructure. Ensure that each DHCP server has a scope available that provides IP configuration for clients located in all subnets.

Question: Are there any requirements that relate to DHCP service availability?

Answer: You must implement DHCP-capable routers; that is, routers that support RFC 1542 enabling the propagation of DHCP broadcast messages between connected subnets. This would enable a single DHCP server to service requests from another subnet where that subnet's DHCP server is offline.

Module Reviews and Takeaways

Review questions

Question: You plan to deploy a web farm. You want to provide a fault tolerant front end for client computers connecting from the Internet. Which would be the most suitable technology?

Answer: Network Load Balancing. This provides for load balancing and high availability of front-end services. To provide high availability of the back end, consider using failover clustering.

Question: Your organization has implemented highly available virtual machines on Windows Server 2008 R2. One of the host servers running the virtual machines fails because of a motherboard failure. Users report that it took more than a minute before some of the virtual machines were available again. What can you do to reduce the time that the servers are not available?

Answer: There is not much you can do when an unplanned outage occurs. The only option is to ensure that you have enough capacity on the other failover cluster nodes to start the virtual machines quickly. Live Migration only applies to planned outages where the administrator initiates the failover.

Tools

Tool	Use for	Where to find it
Failover Cluster Management Console	Creating and managing clusters	Administrative Tools
NLB Manager Console	Creating and managing NLB clusters	Administrative Tools
Disk Management	Configuring disks presented from the storage system	Server Manager

Lab Review Questions and Answers

Question: In the lab, you implemented failover clustering to provide resilience for the Research database. Why would NLB not be suitable?

Answer: The database has state; that is, it contains data that is stored on the server. NLB is suitable for stateless applications, like web front-ends. In the scenario, NLB would play a role in providing resilience for the front-end in the Contoso Research database.

Module 13

Planning Performance and Event Monitoring

Contents:

Lesson 1

Monitoring and Analyzing Server Performance

Contents:

Question and Answers

Importance of Monitoring Performance

Question: What types of proactive performance monitoring are being performed in your environment?

Answer: This is a discussion question designed to facilitate discussion. When students respond, have then identify how the information is being collected, how it is being analyzed and how notification is being handled.

Establishing Baselines

Question: Why is it important to re-establish your baseline on a regular schedule?

Answer: A baseline is only valid as long as it is a measurement of your current environment. If changes are made to your servers, those changes need to be accounted for in a newly established baseline.

Additional Reading

Advanced Performance Analysis

- [Managing Management Packs](#)

Lesson 2

Managing Events

Contents:

Question and Answers

Attaching Tasks to Event Viewer Logs and Events

Question: Why would you want to specify more than one action in an event task?

Answer: You may want to perform an action and send a notification. Your task may require multiple distinct actions to complete the task. For example, you may require a program to run that aggregates information from events (wevtutil) and then another program to manipulate or modify the aggregated data. Most answers that require multiple steps are acceptable.

Module Reviews and Takeaways

Review questions

Question: Why is it important to know your environment well prior to initiating baseline monitoring?

Answer: Even though a baseline helps establish what is normal in your environment, having an idea about what normal might look like in your environment will help you ensure you create accurate and relevant baselines. Also, baseline monitoring can be a resource intensive process, and balancing the need for relevant data and the need to maintain a stable production environment will help you decide when to establish your baselines.

Question: How can a server that is not being over-utilized, has properly performing applications and services and has never experienced any performance or functionality problems still be an opportunity for performance optimization?

Answer: Under-utilized and stable servers are perfect candidates for consolidation through virtualization or other methods.

Question: Give two reasons to centralize event log management.

Answer: single location to review event log entries. Second, forwarded event logs from remote computers are available to review, even if the remote computer is not.

Question: What is the primary purpose for creating custom views in Event Viewer?

Answer: A custom view can provide you with instant results from frequently used filters or searches applied to events that are saved as a custom view.

Windows Server 2008 R2 Features Introduced in this Module

Windows Server 2008 R2 feature	Description
Improved Event Viewer	Event Viewer now supports advanced features such as custom views, keyword filtering, and the Task Wizard.

Tools

Tool	Use for	Where to find it
System Center Operations Manager 2007	Advanced system management and monitoring tasks	http://go.microsoft.com/fwlink/?LinkID=224608
Event Viewer	Viewing and manipulating Windows event logs	Start – Administrative Tools
Task Scheduler	Creating and managing scheduled and programmed tasks	Start – Administrative Tools
Winrm.exe	Configuring the Windows Remote Management service	Command line
Wecutil.exe	Configuring the	Command line

Tool	Use for	Where to find it
	Windows Event Collector service	

Module 14

Enterprise Backup and Recovery

Contents:

Lesson 1

Disaster Recovery Concepts

Contents:

Additional Reading

Planning Backup Across the Enterprise

- [Capability: Data Protection and Recovery](#)

Service Level Agreements

- [Service Level Agreement Review](#)

- [Establishing a Service Level Agreement](#)

Lesson 2

Planning Windows Server Backup

Contents:

Detailed Demonstration Steps

Demonstration: Scheduled Filtered Folder Backup

Detailed demonstration steps

Note   You require the 6430C-NYC-DC1 and 6430C-NYC-SVR1 virtual machines to complete this demonstration. Log on to the virtual machines as Contoso\Administrator, with the password,Pa$$w0rd.

Perform the following steps:

1. Switch to **NYC-SVR1**.

2. Open an elevated Windows PowerShell prompt and run the following commands:

    ```
    Import-Module ServerManager
    Add-WindowsFeature Backup
    ```

3. Open **Windows Server Backup**.

4. In the Windows Server Backup console, click **Backup Schedule**.Click**Next**.

5. On the Select **Backup Configuration** page, click **Custom**, and then click **Next**.

6. On the **Select Items for Backup** page, click **Add Items**.

7. Expand Local disk (C:) and select the check box next to**Users** and click **OK**.

8. Click **Advanced Settings.** Click **Add Exclusion**. Select **C:\Users**, and then click **OK**.

9. In **Excluded File Types**, click on **All Files And Folders** and then type *.**mp3**. Click OK. Click **Next**.

10. On the **Specify Backup Time** page, select**More than once aday** and add a scheduled time of**9:00AM**.Click**Next**.

11. On **Specify Destination Type**, select **Back up toavolume** and click **Next**.

12. Click **Add**, click **All Files (D:)**click OK, and then click **Next**.

13. On the **Confirmation** page, click **Finish**, and then click **Close**.

Note   Revert the virtual machines.

Additional Reading

Windows Server Backup

- [Backing Up Your Server](#)

- [Use Multiple Disks To Store Backups](#)

Windows Server Backup: New Features

- [What's New in Windows Server Backup](#)

Full and Block Level Incremental Backup

- [Tape Is Dead! Long Live Tape!](#)

Volume Shadow Copy Services (VSS) and Streaming Backup

- [Backup Planning](#)

Characteristics of Data-only Backup Strategy

- [Backing Up Applications and Data](#)

Backing Up Windows Server 2008 Components

- [How to Backup/Restore IIS 7 Configuration](#)

- [Recover the System State](#)

- [More About DHCP Backup and Restore](#)

- [AD CS Migration: Migrating the Certification Authority](#)

Advantages of Full Server Backup

- [Backing Up Your Server](#)

Lesson 3

Planning Recovery of Data and Servers

Contents:

Additional Reading

Recovering Data

- [Recover Files and Folders](#)

- [Recover Volumes](#)

Recovering Windows Server 2008 R2 Components

- [How to Backup/Restore IIS 7 Configuration](#)

- [Recover the System State](#)

- [More About DHCP Backup and Restore](#)

- [AD CS Migration: Migrating the Certification Authority](#)

Recovering Servers

- [Recover the Operating System or Full Server](#)

Module Reviews and Takeaways

Review questions

Question: What steps can you take to centralize backup by using Windows Server Backup?

Answer: It is possible to use Windows Server Backup to perform centralized backups to network shares.

Question: What is the limitation of using network shares as a centralized backup solution?

Answer: Back up to a network share can only hold a single day's worth of backups.

Question: What is the difference between an incremental backup in Windows Backup in Windows Server 2003 and an incremental backup in Windows Server Backup in Windows Server 2008 R2?

Answer: Incremental backups in Windows Server 2003 backed up changed files, incremental backups in Windows Server Backup back up blocks that have changed since the last backup

Question: What are the benefits of a solution such as System Center Data Protection Manager 2010 over Windows Server Backup?

Answer: DPM offers a centralized backup solution, a 15-minute RPO, can be used to back up remote sites, and provide backup to cloud locations.

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