Module 1

Installing and Configuring Servers

Contents:
Lesson 1: Installing Windows Server 2008 1-3
Lesson 2: Managing Server Roles and Features 1-12
Lesson 3: Overview of the Server Core Installation Option 1-17
Lab: Installing and Configuring Servers and Server Roles 1-25
Module Overview

- Installing Windows Server 2008
- Managing Server Roles and Features
- Overview of the Server Core Installation Option

This module explains how to identify the appropriate usage scenario and installation type for a server and then install and configure appropriate server roles and features.
Lesson 1
Installing Windows Server 2008

- Windows Server 2008 Editions
- Windows Server 2008 Installation Requirements
- x64 Installation Considerations
- Common Installation Scenarios
- Preparing for the Installation of Windows Server 2008
- Process for Installing Windows Server 2008

Installing Windows Server® 2008 has changed somewhat from previous Windows Server versions. The options available vary from a simple DVD-based install, to using answer files created with Windows System Image Manager (SIM) and automating deployment using the Windows Automated Installation Kit (WAIK). The installation process no longer includes the text mode portion of setup and is completely GUI-based. Another difference is that the Standard, Enterprise, and DataCenter editions all are included on a single 32-bit or 64-bit DVD. The version that is installed depends on the installation key that you use during the installation process.
Windows Server 2008 Editions

<table>
<thead>
<tr>
<th>Edition</th>
<th>Server Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2008 Standard</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows Server 2008 Enterprise</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows Server 2008 DataCenter</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows Web Server 2008</td>
<td>No</td>
</tr>
<tr>
<td>Windows Server 2008 for Itanium-based Systems</td>
<td>No</td>
</tr>
</tbody>
</table>

Key Points
There are five available editions of Windows Server 2008. The edition that you choose will depend upon the business requirements that you need to address.

Windows Server 2008 helps information technology (IT) professionals increase the flexibility of their server infrastructure while offering developers a more robust Web and applications platform for building connected applications and services. Powerful new management tools and security enhancements offer more server and network control, and provide advanced protection for applications and data.
Windows Server 2008 Installation Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>• Minimum: 1Ghz</td>
</tr>
<tr>
<td></td>
<td>• Recommended: 2Ghz</td>
</tr>
<tr>
<td></td>
<td>• Optimal: 3Ghz or faster</td>
</tr>
<tr>
<td>Memory</td>
<td>• Minimum: 512MB RAM</td>
</tr>
<tr>
<td></td>
<td>• Recommended: 1GB RAM</td>
</tr>
<tr>
<td></td>
<td>• Optimal: 2GB RAM (Full) or 1GB RAM (Server Core)</td>
</tr>
<tr>
<td></td>
<td>• Maximum (32-bit): 4GB (Standard) or 64GB (Enterprise and Datacenter)</td>
</tr>
<tr>
<td></td>
<td>• Maximum (64-bit): 32GB (Standard) or 2TB (Enterprise, Datacenter, and Itanium-based systems)</td>
</tr>
<tr>
<td>Available Disk Space</td>
<td>• Minimum: 8GB</td>
</tr>
<tr>
<td></td>
<td>• Recommended: 40GB (Full); 10GB (Core)</td>
</tr>
<tr>
<td></td>
<td>• Optimal: 80GB (Full); 40GB (Core)</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>• DVD-ROM</td>
</tr>
<tr>
<td>Display and Peripherals</td>
<td>• Super VGA (800 x 600) or higher-resolution monitor</td>
</tr>
<tr>
<td></td>
<td>• Keyboard</td>
</tr>
<tr>
<td></td>
<td>• Microsoft mouse or compatible pointing device</td>
</tr>
</tbody>
</table>

Key Points
Installation requirements for Windows Server 2008 vary between the different installation types, namely the full installation or the Server Core installation. Server Core requires less disk space for the operating system’s installation because, by default, only the modules that the assigned roles require are installed. Additionally, the GUI is not installed, which means that disk space utilization is lighter with the Server Core installation.

Note: If you are installing a 64-bit version, you must make sure that all kernel mode drivers are digitally signed prior to installing. The installation will fail if you use unsigned drivers.

Additional Resources:
• Windows Server 2008 Technical Library
x64 Installation Considerations

- Requires that all kernel-mode device drivers are digitally signed
- Device drivers are necessarily trusted because they have direct access to the system’s hardware
- May be able to mitigate some “rootkit” software

Key Points
You may have to include 64-bit versions of Windows Server 2008 in your infrastructure, depending on the company’s needs. For example, some network services, such as Exchange Server 2007, are supported only in a 64-bit production environment and therefore will be supported only for 64-bit versions of Windows Server 2008 running on 64-bit architecture.

Installing a 64-bit version may offer the ability to scale up (more CPUs and RAM) more than a 32-bit system allows, you must ensure that the kernel mode drivers that you will use are all digitally signed.

Additional Resources:
- Windows Server 2008 Technical Library
- Digital Signatures for Kernel Modules on x64-based Systems Running Windows Vista
Common Installation Scenarios

- Clean installations
- Upgrades
- Unattended installations

Key Points

Whether you choose to upgrade an existing server or perform a clean installation, you must decide how you will perform server installations in your environment. There are particular upgrade paths that you must follow, and you can perform unattended installations by using answer files, Windows SIM, and the Windows AIK.

Back up your servers before you upgrade. Your backup should include all data and configuration information that is necessary for the computer to function. It is important to perform a backup of server configuration information, especially for those servers that provide network infrastructure, such as Dynamic Host Configuration Protocol (DHCP) servers. When you perform the backup, be sure to include the boot and system partitions, and the system state data. Another way to back up configuration information is to create a backup set for Automated System Recovery.
Additional Resources:

- Windows Vista Deployment Step by Step Guide
- Windows Server 2008 Technical Library
Preparing for the Installation of Windows Server 2008

Key Points
Before installing Windows Server 2008, you must follow some general guidelines to ensure that the installation is as smooth as possible and that installation errors do not arise. Most of these guidelines are best practices for any installation of Microsoft operating systems, and therefore should be included in any build guides that are created for most environments.

Before you install Windows Server 2008, use the following guidelines to prepare for the installation:

- Check for application compatibility.
- Disconnect UPS devices.
- Back up your servers.
- Disable your virus protection software.
- Run the Windows Memory Diagnostic tool.
• Provide mass storage drivers.
• Be aware that Windows Firewall is on by default.
• Prepare your Active Directory environment with Windows Server 2008 updates.

Additional Resources:
• Web Server
• Help and Support on the Install now page of Windows Server 2008 Setup wizard
Process for Installing Windows Server 2008

Key Points
The process for installing Windows Server 2008 is much the same as in previous versions of the operating system. However, there are differences that make the process more customizable and easier to accomplish than previous versions. One significant change is the volume licensing model that Microsoft uses with the server product. The license model for volume licensing is the same as the model that Windows Vista operating systems use.

Additional Resources:
- Windows Server "Longhorn" Beta 3 Server Manager Technical Overview
- Windows Server 2008: Server Manager
Microsoft has changed the way administrators manage the server environment. The operating system installs in a secure fashion and the administrator can choose among four different methods to configure the server according to desired functionality.

After the installation is complete and the administrator logs on to the server, the Initial Configuration Tasks window opens and allows the administrator to setup the server name, networking configuration, automatic updates and the Windows Firewall settings. After using this tool, the administrator can choose to use custom Microsoft Management Consoles (MMCs) to manage the server, use Server Manager to install and remove roles and features, and use Windows PowerShell for configuration tasks, if desired.
Tools Used for Administrative Tasks

Key Points
After you complete the installation of the operating system, you can manage the systems with four different tools.

On first logon, the Administrator must specify a password for the administrative account and then is presented with the Initial Configuration Tasks window. Subsequent management can be performed using Server Manager, typical Microsoft Management Console windows, and Windows PowerShell. The choice of tool depends on the task users wish to complete and the experience that they must have to work with each specific tool.

Additional Resources:
- Windows PowerShell 1.0 Documentation Pack
- Microsoft Management Console 3.0 for Windows XP (KB907265)
What Are Server Roles?

A server role describes the primary function of a server

- Administrators can dedicate an entire computer to one role or install multiple server roles on a single computer
- Each role can include one or more role services or sub-elements of a role
- Server Manager is the tool that is used to install, configure, and remove Server Roles

Key Points

Server roles in Windows Server 2008 describe a server’s primary function. For example, a server role might be as Active Directory Domain Services or a Web server. You can choose to install one or many roles on a Windows Server 2008 installation. The Server Manager administrative tool is used for the installation and removal of server roles in a Windows Server 2008 environment.

Additional Resources:
- Windows Server 2008 Technical Library
What Are Server Features?

Key Points
A feature does not generally describe the server’s primary function. Instead, it describes a server’s auxiliary or supporting function. Consequently, an administrator typically installs a feature not as the primary function of the server, but to augment the functionality of an installed role. For example, Failover Clustering is a feature that administrators can choose to install after installing specific roles, such as File Services, to make the File Services role more redundant.

Additional Resources:
- Windows Server "Longhorn" Beta 3 Server Manager Technical Overview
- Windows Server 2008 Technical Library
Demonstration: Installing Server Roles and Features Using Server Manager

In this demonstration, you will see how to use Server Manager to install roles and features.
Lesson 3
Overview of the Server Core Installation Option

- Benefits of a Server Core Installation
- Server Roles that a Server Core Installation Supports
- Features that a Server Core Installation Supports
- Managing a Server Core Installation

A new option in Windows Server 2008 is the Server Core option, which installs only what is required to have a manageable server for Active Directory Domain Services (AD DS), Active Directory Lightweight Directory Services (AD LDS), Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), File, Print, and/or Streaming Media Services. A graphical interface is not available with this option. Instead, you use the command-line or remote-management tools to configure and manage the server environment.

If you choose to install this option, the installation does not support upgrading from previous versions. Therefore, you must perform a clean installation. This option is beneficial to many environments because of the reduced management required, reduced attack surface, reduced maintenance needed, and smaller disk space requirements. The space difference realized by installing Server Core is that it only occupies approximately 25% of the disk space that a typical Standard installation uses.
Benefits of a Server Core Installation

Key Points
In Windows Server 2008, administrators now can choose to install a minimal environment that avoids extra overhead. Although this option limits the roles that the server can perform, it can improve security and reduce management. This type of installation is called a Server Core installation.

Server Core installations provide the following benefits:

- Reduced maintenance
- Reduced attack surface
- Reduced management
- Less disk space required

Additional Resources:
- Server Core Installation Option
A Server Core installation supports the following server roles:

- Active Directory Domain Services
- Active Directory Lightweight Directory Services
- DHCP Server
- DNS Server
- File Services
- Print Server
- Streaming Media Services

Key Points

A Server Core installation is a minimal server installation option for Windows Server 2008. Server Core installations provide an environment for running the following server roles:

- Active Directory Domain Services (AD DS)
- Active Directory Lightweight Directory Services (AD LDS)
- Dynamic Host Configuration Protocol (DHCP) Server
- Domain Name System (DNS) Server
- File Services
- Print Server
- Streaming Media Services
The Server Core installation option installs only the subset of the binary files that are required by the supported server roles. For example, the Windows Explorer user interface (or ‘shell’) is not installed as part of a Server Core installation. Instead, the default user interface for a server running a Server Core installation is the command prompt.

**Additional Resources:**
- Server Core Installation Option
Features that a Server Core Installation Supports

<table>
<thead>
<tr>
<th>A Server Core installation supports the following features:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Backup</td>
</tr>
<tr>
<td>• Bitlocker Drive Encryption</td>
</tr>
<tr>
<td>• Failover Clustering</td>
</tr>
<tr>
<td>• Multipath I/O</td>
</tr>
<tr>
<td>• Network Load Balancing</td>
</tr>
<tr>
<td>• Removable Storage</td>
</tr>
<tr>
<td>• Simple Network Management Protocol</td>
</tr>
<tr>
<td>• Subsystem for UNIX-based applications</td>
</tr>
<tr>
<td>• Telnet Client</td>
</tr>
<tr>
<td>• WINS</td>
</tr>
</tbody>
</table>

Key Points

After the Server Core installation is complete and the server is configured, you can install one or more optional features. The Server Core installation of Windows Server 2008 supports the following optional features:

- Backup
- Bitlocker Drive Encryption
- Failover Clustering
- Multipath input/output (I/O)
- Network Load Balancing
- Removable Storage
- Simple Network Management Protocol (SNMP)
• Subsystem for UNIX-based applications
• Telnet client
• Windows Internet Name Service (WINS)

**Note:** Failover Clustering is not available in Windows Server 2008 Standard Edition.

**Additional Resources:**
• Server Core Installation Option of Windows Server "Longhorn" Step-By-Step Guide
Managing a Server Core Installation

A Server Core installation can be managed:

- Locally and remotely using a command prompt
- Remotely using Terminal Server
- Remotely using Windows Remote Shell
- Remotely using an MMC snap-in

Key Points
The Server Core installation option is designed for use in environments where high security requirements necessitate a minimal attack surface on a server, or in organizations that have many servers, only some of which need to perform dedicated tasks.

Because no graphical user interface is available for many Windows operations, using the Server Core installation option requires administrators to be experienced in using a command prompt or scripting techniques for local administration of the server. Alternatively, you can manage the Server Core installation with Microsoft Management Console (MMC) snap-ins from another computer running Windows Server 2008. To do this, select the computer running a Server Core installation as a remote computer to manage.
Note: Administrators managing a Server Core installation need to be aware that there is no graphical user interface (GUI). Although no changes are required to the configuration of your network, you might need to become familiar with command-line tools.

Additional Resources:
- Server Core Installation Option
- Installation and Configuration for Windows Remote Management
Lab: Installing and Configuring Servers and Server Roles

- Exercise 1: Identifying Server Types
- Exercise 2: Installing and Configuring Server Roles and Features
- Exercise 3: Configuring Server Core and Performing Basic Management Tasks

Logon information

<table>
<thead>
<tr>
<th>Virtual machines</th>
<th>NYC-DC1, NYC-SVR1, NYC-SVR2</th>
</tr>
</thead>
<tbody>
<tr>
<td>User name</td>
<td>Administrator</td>
</tr>
<tr>
<td>Password</td>
<td>Pa$$w0rd</td>
</tr>
</tbody>
</table>

Estimated time: 60 minutes

Objectives

After completing this lab, you will be able to:

- Describe the appropriate server type needed for a usage scenario
- Install and configure server roles and features
- Configure Server Core and perform basic management tasks
**Scenario**
You have to install two new servers for your corporate infrastructure in the WoodgroveBank.com domain. The new servers are needed to increase DNS name-resolution services for a newly acquired company, Contoso.com, and to provide Terminal Services for some line-of-business applications that will be available to employees from their desktop computers and from their homes after hours. The Terminal Services server also will need to have backup capability installed for disaster recovery purposes.

For security purposes, the DNS service should be available on only one of the new servers and will be administered completely through remote management tools after initial configuration. Firewall configuration on the DNS server needs to be configured correctly for the ports required to respond to DNS name-resolution requests and for remote administration.

**Lab Setup**
For this lab you will use the available virtual machine environment. Before you begin the lab, you must:

1. Start the 6421A-NYC-DC1 and 6421A-NYC-SVR1 virtual machines.
2. Log on to 6421A-NYC-SVR1 with the user name **Woodgrovebank\administrator** and the password of **Pa$$w0rd**.
3. Close the Initial Configuration Tasks window that appears after log on.
4. Close the Server Manager window that appears.
Exercise 1: Identifying Server Types

Exercise Overview
In this exercise, you will analyze the scenario and answer the following questions related to a possible server type and role deployment.

**Question:** After reading the scenario, which installation type, Core or Standard, would be suitable for Terminal Services? Why?

**Question:** Would the Core installation be suitable for the Domain Name System (DNS) server? If so, are there any shortcomings to configuring the server to host this role?

**Question:** What benefits would you realize by using the Core installation option for the DNS server role?

**Question:** What roles and features are needed on the servers to meet the given scenario’s requirements?
Exercise 2: Installing and Configuring Server Roles and Features

In this exercise, you will install the Terminal Services role and Server Backup feature by using the Server Manager administrative tool.

The main tasks are as follows:

1. Ensure that you have completed the steps in the Lab Setup.
2. Start the Server Manager console.
3. From Server Manager, install the Terminal Services role.
4. View the installation results.
5. Install the Server Backup feature from the Server Manager console.
6. Verify the Terminal Services and Windows Server Backup tools are installed.

► Task 1: Ensure that you have completed the steps in the Lab Setup
   • Look in the Lab Setup section and ensure you have completed the steps before you continue with this lab.

► Task 2: Start the Server Manager console
   • On NYC-SVR1, start the Server Manager console.

► Task 3: From Server Manager, install the Terminal Services role
   1. Install the Terminal Services role using the following options:
      • Server Roles: Terminal Services
      • Role Services: Terminal Server
      • Authentication method: Do not require Network Level Authentication
      • Licensing Mode: Configure later
      • User Groups: Administrators
   2. Restart as required.
Task 4: View the Installation Results
1. Log on to NYC-SVR1 with the user name Woodgrovebank\administrator and the password Pa$$w0rd.
   Upon successful logon, Server Manager opens and the Terminal Services configuration resumes.
2. Once complete, Installation succeeded appears in the details pane. Click Close to exit the Installation Results page. Do not close Server Manager.

Task 5: Install the Server Backup feature from the Server Manager console
1. In the Server Manager list pane, right-click Features, and then click Add Features. The Add Features Wizard appears.
2. Install the Windows Server Backup Features option.
3. On the Installation Results page, verify Installation succeeded appears in the details pane, and then click Close. Do not close Server Manager.
   The Windows Server Backup feature is installed.

Task 6: Verify the Terminal Services and Windows Server Backup tools are installed
1. In the list pane of Server Manager, verify that Server Manager (NYC-SVR1) is selected.
2. Using the scroll bar in the details pane, scroll down until the Roles Summary is visible and verify that Terminal Services is listed.
3. Scroll down to Features Summary and verify that Windows Server Backup appears.
Exercise 3: Configuring Server Core and Performing Basic Management Tasks

In this exercise, you will configure a Core installation of Windows Server 2008 and install the DNS server role using command-line tools. You then will connect to the Core server from a remote Windows Server 2008 computer using a custom MMC to configure the DNS server role.

The 6421A-NYC-DC1 and 6421A-NYC-SVR1 virtual machines must be running to complete the exercise. Be sure to start the virtual machines prior to beginning this exercise.

The main tasks are as follows:
1. Start the 6421A-NYC-SVR2 virtual machine.
2. Log on to the Server Core installation.
3. Use command-line tools to set parameters in the Server Core virtual machine.
4. Connect the server to the WoodgroveBank.com domain.
5. Log on to the Server Core installation.
6. Verify the firewall configuration.
7. Use the `netsh` command to open ports.
8. View the current status of roles and install the DNS server role.
9. Manage the server by using DNS Manager from a remote computer.
10. Close all virtual machines and delete the changes.

▶ Task 1: Start the 6421A-NYC-SVR2 virtual machine
- From the Virtual Machine Administration Website, start the 6421A-NYC-SVR2 virtual machine.

▶ Task 2: Log on to the Server Core installation
- Log on to NYC-SVR2 as Administrator with a password of Pa$$w0rd.
Task 3: Use command line tools to set parameters in the Server Core virtual machine

- Computername=NYC-DNSSVR2
- IP address=10.10.0.12
- Mask=255.255.0
- Gateway=10.10.0.1
- DNS=10.10.0.10

1. To determine the current default assigned computer name, type `set` in the command window.
2. Locate the computer name attribute and write it down.
3. To change the computer name, type the following command and then press ENTER:

   ```
   Netdom renamecomputer NYC-SVR2/NewName:NYC-DNSSVR2
   ```
4. When prompted, type `y` for yes, and then press ENTER.
5. In the command window, type the following command to set the static IP address: `Netsh interface ipv4 set address name=“local area connection” source=static address=10.10.0.12 mask=255.255.0.0 gateway=10.10.0.1` and then press ENTER.
6. In the command window, type the following command to set the primary DNS server and then press ENTER:

   ```
   Netsh interface ip set dns “local area connection” static 10.10.0.10 primary
   ```
7. At the command prompt, type `ipconfig /all` and then press ENTER to verify the IP address assignment.
8. On the keyboard, press RIGHT-ALT+DELETE.
9. Choose to restart the computer by clicking Shutdown options in the lower right-hand pane of the window, and then click Restart.
10. In the Shutdown Event Tracker window, click Operating System: Reconfiguration (Planned), and then click OK. The server restarts.
11. Log on to the server with the user name Administrator and a password of Pa$$w0rd.
Task 4: Connect the server to the WoodgroveBank.com domain
1. In the command window type the following command and then press ENTER.
   ```bash
   ```
2. At the command prompt, type the following command and then press ENTER:
   ```plaintext
   Pa$$w0rd
   ```

   **Note:** Your keystrokes will not be reflected on the screen. You will receive a message that the command completed successfully and that the computer needs to be restarted.

3. At the command prompt, press RIGHT-ALT+DELETE, click the Shut down options icon, and then click Restart. The Shut Down Windows dialog box appears.
4. In the Option box of the Shut Down Windows dialog box, click Operating System: Reconfiguration (Planned), and then click OK.

Task 5: Log on to the Server Core installation
- Log on to the server with the user name Administrator and a password of Pa$$w0rd.

Task 6: Verify the firewall configuration
- Use the netsh command to view the current firewall configuration. Type the following command in the command window, and then press ENTER:
  ```bash
  Netsh firewall show state
  ```

   **Note:** Notice that the Firewall status shows that the Operational mode is set to Enable. This means that the Windows Firewall is enabled but no specific ports have been opened.
Task 7: Use the Netsh command to open ports

1. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening ALL 53 DNS-server`
2. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening TCP 135 remote-admin`
3. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening UDP 137 netbios-ns`
4. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening UDP 138 netbios-dgm`
5. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening TCP 139 netbios-ssn`
6. At the command prompt, type the following command and then press ENTER:
   `netsh firewall add portopening TCP 445 netbios-ns`
7. At the command prompt, type the following command and then press ENTER:
   `netsh firewall show config`

**Note:** Notice that in the Service configuration for Domain profile, File and Printer Sharing and Remote Desktop services are set to enable, and both TCP and UDP port 53 are open for the DNS server.
Task 8: View the current status of roles and install the DNS server role

1. In the command prompt window, at the command prompt, type the following command and then press ENTER:
   
   oclist

   **Note:** Verify that no server roles are installed.

2. Use the Ocsetup.exe and oclist commands to install the DNS server. To do this, type the following at the command prompt and then press ENTER:
   
   start /w ocsetup DNS-Server-Core-Role

   **Note:** The server role name is case sensitive.

3. At the command prompt, type the following command and then press ENTER:
   
   oclist

   **Note:** Verify that the DNS-Server-Core-Role is installed.
➢ Task 9: Manage the server by using DNS Manager from a remote computer
   1. On NYC-DC1, open the DNS Manager console.
   2. From the DNS console, connect to NYC-DNSSVR2.
   3. Use the DNS console to create a forward lookup zone for Contoso.com:
      a. In the Console Root tree pane of the DNS Manager, expand NYC-DNSSVR2, and then click Forward Lookup Zones.
      b. Right-click Forward Lookup Zones, and then click New Zone.
      c. Click Next in the Welcome to the New Zone wizard.
      d. Click Next in the Zone Type dialog box, using the defaults to create a Primary zone.
      e. In the Zone Name window, type Contoso.com and then click Next.
      f. Click Next to accept the default name for the DNS zone file.
      g. In the Dynamic Update window, click Next to accept the defaults.
      h. In the Completing the New Zone Wizard dialog box, click Finish to create the new zone.
      i. Close the DNS Manager console.

➢ Task 10: Close all virtual machines and discard undo disks
   1. On the host computer, click Start, point to All Programs, point to Microsoft Virtual Server, and then click Virtual Server Administration Website.
   2. Under Navigation, click Master Status. For each virtual machine that is running, click the Virtual Machine Name, and in the context menu, click Turn off Virtual Machine and Discard Undo Disks. Click OK.
Module Review and Takeaways

- Review Questions
- Considerations for Installing Windows Server 2008
- Best Practices
- Tools

Review Questions
1. If your organization is planning a large-scale virtualization project to consolidate multiple servers on a few large-scale servers, what version of Windows would be best suited for this project and why?

2. What are the primary benefits of using the Core Installation for a Windows Server 2008 version?

3. You are responsible for many classrooms in an educational facility. Desktop operating system image refreshes take place on a weekly basis and involve approximately 300 computers. What type of volume-license scheme would work best – KMS Server or MAK, and why?

4. What is the difference between a role and a feature? How do you install each?
Considerations for Installing Windows Server 2008
Consider the following prior to installing Windows Server 2008:

- You can install Windows Server 2008 only on computers that use Advanced Configuration and Power Interface (ACPI).
- You cannot specify a custom hardware application layer (HAL) file with Windows Server 2008.
- Windows Firewall is enabled by default. Server applications that must receive unsolicited inbound connections will fail until you create inbound firewall rules to allow them.
- The mandatory kernel-mode code-signing policy applies to all kernel-mode software on x64-based systems running Windows Server 2008.
- You cannot upgrade a previous version of Windows Server to a Core installation. The installation must be clean.


- Always use signed kernel mode drivers when available. This is mandatory for x64 installations.
- Only install the Roles and Features required for the server’s intended purpose.
- Only allow inbound connections that are required for the installed Roles and Features on a given server.
- Enable Remote Desktop for Administrators on CORE installations. The shell will be the command prompt for terminal connections made.
## Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Use for</th>
<th>Where to find it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Management Console</td>
<td>Local and remote administration of all installed roles and features in Windows Server 2008.</td>
<td>Click <strong>Start</strong> and then point to <strong>Administrative Tools</strong>. Select a pre-configured tool or type <strong>MMC</strong> in the <strong>Run</strong> box to create a custom MMC console based on the snap-ins you specify.</td>
</tr>
<tr>
<td>Initial Configuration Tasks</td>
<td>Initial configuration of the server. Tasks include computername, automatic updates, roles, features, firewall configuration, and remote-desktop configuration.</td>
<td>ICT launches when the administrator logs on the installation of Windows Server 2008.</td>
</tr>
<tr>
<td>Server Manager</td>
<td>Management and maintenance of the installation and removal of roles and features.</td>
<td>Click <strong>Start</strong>, and then point to <strong>Administrative Tools. Select Server Manager</strong> from the available administrative tools.</td>
</tr>
</tbody>
</table>