Windows Server 2012 R2 Editions

There are several different editions of Windows Server 2012 R2 from which to choose. These editions allow organizations to select a version of Windows Server 2012 R2 that best meets their needs, rather than pay for features they do not require.

When deploying a server for a specific role, systems administrators can save substantially by selecting the appropriate edition.

The following table lists the Windows Server 2012 R2 editions.

Windows Server 2012 editions:

- Windows Server 2012 Standard
- Windows Server 2012 Datacenter
- Windows Server 2012 Foundation
- Windows Server 2012 Essentials
- Microsoft Hyper-V Server 2012
- Windows Storage Server 2012 Workgroup
- Windows Storage Server 2012 Standard
- Windows MultiPoint Server 2012 Standard
- Windows MultiPoint Server 2012 Premium

Edition	Description
The Windows Server 2012 R2 Standard operating system	Provides all the roles and features available on the Windows Server 2012 R2 platform. Supports up to 64 sockets and up to 4 terabytes (TB) of random access memory (RAM). Includes two virtual machine licenses.
The Windows Server 2012 R2 Datacenter operating system	Provides all the roles and features that are available on the Windows Server 2012 R2 platform. Includes unlimited virtual machine licenses for virtual machines that are run on the same hardware. Supports 64 sockets, up to 640 processor cores, and up to 4 TB of RAM.

The Windows Server 2012 R2 Foundation operating system	Designed for small business owners, it allows only 15 users, cannot be joined to a domain, and includes limited server roles. Supports one processor core and up to 32 gigabytes (GB) of RAM.
The Windows Server 2012 R2 Essentials operating system	Next edition of Small Business Server. It is now available in two forms: • As an installable server role in an existing domain. • As a core Windows Server edition on a virtual machine (using a wizard). It cannot function as a Hyper-V®, Failover Clustering, Server Core, or Remote Desktop Services server. It has limits for 25 users and 50 devices. Supports two processor cores and 64 GB of RAM. There are many new features and improvements for Windows Server 2012 R2 Essentials R2, including client deployment, user management, storage and data protection, and Office 365 integration.
Microsoft Hyper-V Server 2012	Standalone Hyper-V platform for virtual machines with no UI. No licensing cost (free) for host operating system, but virtual machines are licensed normally. Supports 64 sockets and 4 TB of RAM. Supports domain join. Does not support other Windows Server 2012 R2 roles, other than limited file services features.
The Windows Storage Server®2012 Workgroup operating system	Entry-level unified storage appliance. Limited to 50 users, one processor core, 32 GB of RAM. Supports domain join.
The Windows Storage Server 2012 Standard operating system	Supports 64 sockets, but is licensed on a two-socket, incrementing basis. Supports 4 TB of RAM. Includes two virtual machine licenses. Supports domain join. Supports some roles, including DNS and DHCP Server roles, but does not support others, including Active Directory® Domain Services (AD DS), Active Directory Certificate Services (AD CS), and Active Directory Federation Services (AD FS).
The Windows MultiPoint Server 2012 Standard operating system	Supports multiple users accessing the same host computer directly using separate mouse, keyboard, and monitors. Limited to one socket, 32 GB of RAM, and a maximum of 12 sessions. Supports some roles, including DNS and DHCP Server roles, but does not support others, including AD DS, AD CS, and AD FS. Does not support domain join.
The Windows MultiPoint Server 2012 Premium operating system	Supports multiple users accessing the same host computer directly using separate mouse, keyboard, and monitors. Limited to two sockets, 4 TB of RAM, and a maximum of 22 sessions. Supports some roles, including DNS and DHCP Server roles, but does not support others, including AD DS, AD CS, and AD FS. Supports domain join.

Server Core:

- Is a more secure, less resource-intensive installation option
- Can be converted to full graphical shell version of Windows Server 2012
- Is the default installation option for Windows Server 2012
- Is managed locally using sconfig.cmd

➢ Note that if you enable remote management, you rarely will need to sign in locally

You can switch from Server Core to the graphical version of Windows Server 2012 R2 by running the following Windows PowerShell cmdlet, where c:\mount is the root directory of a mounted image that hosts the full version of the Windows Server 2012 R2 installation files:

```
Install-WindowsFeature -IncludeAllSubFeature User-Interfaces-Infra -Source c:\mount
```

 **Note:** If you accidentally close the command window on a computer that is running Server Core, you can recover the command window by performing the following steps:

1. Press the Ctrl+Alt+Del keys, and then click **Task Manager**.
2. From the **File** menu, click **New Task (Run...)**, and then type **cmd.exe**.

Windows Server 2012 R2 Roles

To correctly plan how you are going to use Windows Server 2012 R2 to support your organization's requirements, you need to be fully aware of what roles are available as part of the operating system. Each version of Windows Server comes with a different set of roles. As new versions of Windows Server are released, some roles are enhanced and others are deprecated. For the most part, the roles that are available in Windows Server 2012 R2 are familiar to IT professionals that have managed Windows Server 2008 and Windows Server 2003.

Functions

- Web Server
- Domain Controller
- Certificate Server

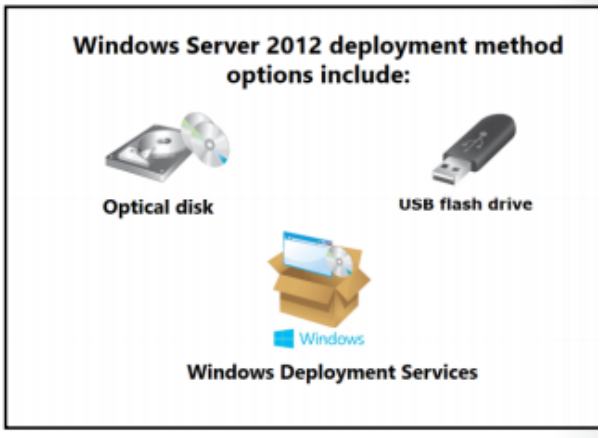
Roles

- Roles are made up of role services components that provide additional functionality associated with the role
- In Server Manager 2012, console servers with a similar role are grouped together
- Role deployment also includes the configuration of dependencies

Installation Methods

Microsoft distributes Windows Server 2012 R2 on optical media and in an .iso (ISO) image format. ISO format is becoming more common as organizations acquire software over the Internet rather than obtaining physical removable media.

Once you have obtained the Windows Server 2012 R2 operating system from Microsoft, you can then use your own method to deploy the operating system. You can install Windows Server 2012 R2 by using a variety of methods, including the following:



- Windows Deployment Services
  - Advantages include:
    - You can deploy Windows Server 2012 R2 from .wim image files or specially prepared VHD files.
    - You can use the Windows Automated Installation Kit (AIK) to configure lite-touch deployment.
    - Clients perform a Preboot eXecution Environment (PXE) boot to contact the Windows Deployment Services server, and the operating system image is transmitted to the server over the network.
    - Windows Deployment Services allows multiple concurrent installations of Windows Server 2012 R2 using multicast network transmissions.

Choosing Whether to Upgrade or Migrate

Once the decision has been made to move to a new server operating system, and you have determined that your apps are compatible with the new operating system, you must choose whether to perform an in-place upgrade of the operating system on the existing hardware, or perform a clean install on new hardware and migrate the roles, apps and data.

In-place upgrade

Advantages:
- Generally straightforward process which takes less time and planning than a migration strategy
- All server roles, features, data and application settings are maintained

Disadvantages:
- More difficult to troubleshoot installation failures caused by existing applications or server roles
- Existing problems and configuration issues might be brought into the new operating system

Migration

Advantages:
- Easier to troubleshoot installation failures
- Existing configuration or application issues are not carried forward to the new operating system
- You can easily move to updated versions of applications

Disadvantages:
- Requires all applications to be re-installed and configured
- Requires planning of migration of server roles
- Requires migration of data
- Requires the purchase of new hardware

If you choose an in-place upgrade, Setup performs compatibility checks to verify that all the components can be upgraded. Any identified issues are shown in a compatibility report that appears during Setup. This report might include guidance on what steps need to be taken to correct these issues.

Windows Server 2012 has the following minimum hardware requirements:

- Processor architecture x64
- Processor speed 1.4 GHz
- Memory (RAM) 512 MB
- Hard disk drive space 32 GB
  - More hard disk drive space is needed if the server has more than 16 GB of RAM

Module 1

Lab: Deploying and Managing Windows Server 2012 R2

Exercise 1: Deploying Windows Server 2012 R2

▶ Task 1: Install the Windows Server® 2012 server

1. Open the Hyper-V® Manager console.
2. Click **20410C-LON-SVR3**.
3. In the Actions pane, click **Settings**.
4. Under Hardware, click **DVD Drive**.
5. Click **Image file**, and then click **Browse**.
6. Browse to **D:\Program Files\Microsoft Learning\20410\Drives**, and then click **Windows2012R2RTM.iso**.
7. Click **Open**, and then click **OK**.

8. In the Hyper-V Manager console, double-click **20410C-LON-SVR3**.
9. In the Virtual Machine Connection Window, in the **Action** menu, click **Start**.
10. In the Windows Setup Wizard, on the **Windows Server 2012 R2** page, verify the following settings, and then click **Next**.
    - Language to install: **English (United States)**
    - Time and currency format: **English (United States)**
    - Keyboard or input method: **US**
11. On the **Windows Server 2012 R2** page, click **Install now**.
12. On the **Select the operating system you want to install** page, select **Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)**, and then click **Next**.
13. On the **License terms** page, review the operating system license terms, select the **I accept the license terms** check box, and then click **Next**.
14. On the **Which type of installation do you want?** page, click **Custom: Install Windows only (advanced)**.
15. On the **Where do you want to install Windows?** page, verify that **Drive 0 Unallocated Space** has enough space for the Windows Server 2012 R2 operating system, and then click **Next**.

Post-Installation Configuration of Windows Server 2012 R2

The Windows Server 2012 R2 installation process involves answering a minimal number of questions. Once you have completed installation, you need to perform several post-installation configuration steps before you can deploy it in a production environment. These steps allow you to prepare the server for the role it will perform on your organization's network.

This lesson includes how to perform a range of post-installation configuration tasks, including configuring network addressing information, setting a server's name and joining it to the domain, and understanding product activation options.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe how to use Server Manager to perform post-installation configuration tasks.
- Describe how to configure server network settings.
- Describe how to join an Active Directory domain.
- Explain how to perform an offline domain join.
- Explain how to activate Windows Server 2012 R2.
- Describe how to configure a Server Core installation.

▶ Task 2: Change the server name

1. Sign in to LON-SVR3 as **Administrator** with the password **Pa$$w0rd**.
2. In Server Manager, click **Local Server**.
3. Click the randomly-generated name next to **Computer name**.
4. In the **System Properties** dialog box, on the **Computer Name** tab, click **Change**.
5. In the **Computer Name/Domain Changes** dialog box, in the **Computer name** text box, enter the name **LON-SVR3**, and then click **OK**.
6. In the **Computer Name/Domain Changes** dialog box, click **OK**.
7. Close the **System Properties** dialog box.
8. In the **Microsoft Windows** dialog box, click **Restart Now**.

▶ Task 3: Change the date and time

1. Sign in to server LON-SVR3 as **Administrator** with the password **Pa$$w0rd**.
2. On the taskbar, click the time display. A pop-up window with a calendar and a clock appears.
3. In the pop-up window, click **Change date and time settings**.
4. In the **Date and Time** dialog box, click **Change Time Zone**.
5. In the **Time Zone Settings** dialog box, set the time zone to your current time zone, and then click **OK**.
6. In the **Date and Time** dialog box, click **Change Date and Time**.
7. Verify that the date and time that display in the **Date and Time Settings** dialog box match those in your classroom, and then click **OK**.
8. To close the **Date and Time** dialog box, click **OK**.

▶ Task 4: Configure the network

1. On LON-SVR3, in the Server Manager console, click **Local Server**.
2. In the **Server Manager** console, next to **Ethernet**, click **IPv4 Address Assigned by DHCP, IPv6 Enabled**.
3. In the **Network Connections** dialog box, right-click **Ethernet**, and then click **Properties**.
4. In the **Ethernet Properties** dialog box, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
5. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box, click **Use the following IP address**, enter the following IP address information, and then click **OK**:
   - IP address: **172.16.0.101**
   - Subnet Mask: **255.255.0.0**
   - Default Gateway: **172.16.0.1**
   - Preferred DNS server: **172.16.0.10**
6. Click **Close** to close the **Ethernet Properties** dialog box.
7. Close the **Network Connections** dialog box.

Make sure 20410C-LON-DC1 RUNNING BEFORE THE TASK 5

▶ Task 5: Add the server to the domain

1. On LON-SVR3, in the Server Manager console, click **Local Server**.
2. Next to Workgroup, click **WORKGROUP**.
3. In the **System Properties** dialog box, on the **Computer Name** tab, click **Change**.
4. In the **Computer Name/Domain Changes** dialog box, in the **Member Of** area, click the **Domain** option.
5. In the **Domain** box, type **adatum.com**, and then click **OK**.
6. In the **Windows Security** dialog box, enter the following details, and then click **OK**:
   - Username: **Administrator**
   - Password: **Pa$$w0rd**
7. In the **Computer Name/Domain Changes** dialog box, click **OK**.
8. When informed that you must restart the computer to apply changes, click **OK**.
9. In the **System Properties** dialog box, click **Close**.
10. In the Microsoft Windows dialog box, click **Restart Now**.
11. After LON-SVR3 restarts, sign in as **Adatum\Administrator** with the password **Pa$$w0rd**.

Exercise 2: Configuring Windows Server 2012 R2 Server Core

▶ Task 1: Set computer name

1. Sign in to LON-CORE as **Administrator** with the password **Pa$$w0rd**.
2. At the command prompt, type **sconfig.cmd** and press Enter.
3. To select Computer Name, type **2**, and then press Enter.
4. Enter the computer name **LON-CORE**, and then press Enter.
5. In the **Restart** dialog box, click **Yes**.
6. Sign in to server LON-CORE using the **Administrator** account with the password **Pa$$w0rd**.
7. At the command prompt, type **hostname**, and then press Enter to verify the computer's name.

▶ Task 2: Change the computer's date and time

1. Ensure you are signed in to server LON-CORE as **Administrator** with the password **Pa$$w0rd**.
2. At the command prompt, type **sconfig.cmd**, and then press Enter.
3. To select **Date and Time**, type **9**, and then press Enter.
4. In the **Date and Time** dialog box, click **Change time zone**. Set the time zone to the same time zone that your classroom uses, and then click **OK**.
5. In the **Date and Time** dialog box, click **Change Date and Time**, and verify that the date and time match those in your location. To dismiss the dialog boxes, click **OK** two times.
6. In the Command Prompt window, type **15**, and then press Enter to exit **Server Configuration**.

▶ Task 3: Configure the network

1. Ensure that you are signed in to server LON-CORE using the account **Administrator** and password **Pa$$w0rd**.
2. At the command prompt, type **sconfig.cmd**, and then press Enter.
3. To configure Network Settings, type **8**, and then press Enter.
4. Type the index number of the network adapter that you want to configure, and then press Enter.
5. On the **Network Adapter Settings** page, type **1**, and then press Enter. This sets the Network Adapter Address.
6. To select static IP address configuration, type **S**, and then press Enter.
7. At the Enter static IP address: prompt, type **172.16.0.111**, and then press Enter.
8. At the Enter subnet mask prompt, Type **255.255.0.0**, and then press Enter.
9. At the Enter default gateway prompt, type **172.16.0.1**, and then press Enter.
10. On the **Network Adapter Settings** page, type **2**, and then press Enter.

    This configures the DNS server address.
11. At the Enter new preferred DNS server prompt, type **172.16.0.10**, and then press Enter.
12. In the **Network Settings** dialog box, click **OK**.
13. Press Enter to not configure an alternate DNS server address.
14. Type **4**, and then press Enter to return to the main menu.
15. Type **15**, and then press Enter to exit sconfig.cmd.
16. At the command prompt, type **ping lon-dc1.adatum.com** to verify connectivity to the domain controller from LON-CORE.

▶ Task 4: Add the server to the domain

1. Ensure that you are signed in to server LON-CORE using the account **Administrator** with password **Pa$$w0rd**.
2. At the command prompt, type **sconfig.cmd**, and then press Enter.
3. To switch to configure Domain/Workgroup, type **1**, and then press Enter.
4. To join a domain, type **D**, and then press Enter.
5. At the **Name of domain to join** prompt, type **adatum.com** and press Enter.
6. At the Specify an authorized domain\user prompt, type **Adatum\Administrator**, and then press Enter.
7. At the Type the password associated with the domain user prompt, type **Pa$$w0rd** and then press Enter.
8. At the Change Computer Name prompt, click **No**.
9. In the **Restart** dialog box, click **Yes**.
10. Sign in to server LON-CORE with the **Adatum\Administrator** account and the password **Pa$$w0rd**.

MAKE SURE LON-CORE LOGGED IN TO DOMAIN ADATUM.COM

Exercise 3: Managing Servers

▶ Task 1: Create a server group

1. Sign in to LON-DC1 with the **Administrator** account and the password **Pa$$w0rd**.
2. In the Server Manager console, click **Dashboard**, and then click **Create a server group**.
3. In the **Create Server Group** dialog box, click the **Active Directory** tab, and then click **Find Now**.
4. In the **Server group name** box, type **LAB-1**.
5. Use the arrow to add **LON-CORE** and **LON-SVR3** to the server group. Click **OK** to close the **Create Server Group** dialog box.
6. In the Server Manager console, click **LAB-1**. Press and hold the **Ctrl** key, and then select both **LON-CORE** and **LON-SVR3**.
7. Scroll down, and under the **Performance** section, select both **LON-CORE** and **LON-SVR3**.
8. Right-click **LON-CORE**, and then click **Start Performance Counters**.

▶ Task 2: Deploy features and roles to both servers

1. In Server Manager on LON-DC1, click **LAB-1**.
2. Scroll to the top of the pane, right-click **LON-CORE**, and then click **Add Roles and Features**.
3. In the Add Roles and Features Wizard, click **Next**.
4. On the **Select installation type** page, click **Role-based or feature-based installation**, and then click **Next**.
5. On the **Select destination server** page, verify that **LON-CORE.Adatum.com** is selected, and then click **Next**.
6. On the **Select server roles** page, select **Web Server (IIS)**, and then click **Next**.
7. On the **Features** page, select **Windows Server Backup**, and then click **Next**.
8. On the **Web Server Role (IIS)** page, click **Next**.
9. On the **Select Role Services** page, add the **Windows Authentication** role service, and then click **Next**.
10. On the **Confirm installation selections** page, select the **Restart the destination server automatically if required** check box, and then click **Install**.
11. Click **Close** to close the Add Roles and Features Wizard.
12. In Server Manager, right-click **LON-SVR3**, and then click **Add Roles and Features**.
13. In the Add Roles and Features Wizard, on the **Before you begin** page, click **Next**.
14. On the **Select installation type** page, click **Role-based or feature-based installation**. Click **Next**.
15. On the **Select destination server** page, verify that **LON-SVR3.Adatum.com** is selected, and then click **Next**.
16. On the **Server Roles** page, click **Next**.
17. On the **Select features** page, click **Windows Server Backup**, and then click **Next**.
18. On the **Confirm installation selections** page, select the **Restart the destination server automatically if required** check box, and then click **Install**.
19. Once the install commences, click **Close**.
20. In Server Manager, refresh the view, click the **IIS** node, and then verify that LON-CORE is listed.

Exercise 4: Using Windows PowerShell to Manage Servers

▶ Task 1: Use Windows PowerShell to connect remotely to servers and view information

1. Sign in to LON-DC1 with the **Adatum\Administrator** account and the password **Pa$$w0rd**.
2. In the Server Manager console, click **LAB-1**.
3. Right-click **LON-CORE**, and then click **Windows PowerShell**.
4. At the command prompt, type the following, and then press Enter:

```
Import-Module ServerManager
```

5. To review the roles and features installed on LON-CORE, at the command prompt, type the following, and then press Enter:

```
Get-WindowsFeature
```

6. To review the running services on LON-CORE, at the command prompt, type the following, and then press Enter:

```
Get-service | where-object {$_.status -eq "Running"}
```

7. To view a list of processes on LON-CORE, at the command prompt, type the following, and then press Enter:

```
Get-process
```

8. To review the IP addresses assigned to the server, at the command prompt, type the following, and then press Enter:

```
Get-NetIPAddress | Format-table
```

9. To review the most recent 10 items in the security log, at the command prompt, type the following, and then press Enter:

```
Get-EventLog Security -Newest 10
```

10. Close Windows PowerShell.

▶ Task 2: Use Windows PowerShell to remotely install new features

1. On LON-DC1, on the taskbar, click the **Windows PowerShell** icon.
2. To verify that the XPS Viewer feature has not been installed on LON-SVR3, type the following command, and then press Enter:

```
Get-WindowsFeature -ComputerName LON-SVR3
```

3. To deploy the XPS Viewer feature on LON-SVR3, type the following command, and then press Enter

```
Install-WindowsFeature XPS-Viewer -ComputerName LON-SVR3
```

4. To verify that the XPS Viewer feature has now been deployed on LON-SVR3, type the following command and then press Enter:

```
Get-WindowsFeature -ComputerName LON-SVR3
```

5. In the Server Manager console, from the **Tools** drop-down menu, click **Windows PowerShell ISE**.

6. In the Windows PowerShell ISE window, in the Untitled1.ps1 script pane, type the following, pressing Enter after each line:

```
Import-Module ServerManager
Install-WindowsFeature WINS -ComputerName LON-SVR3
Install-WindowsFeature WINS -ComputerName LON-CORE
```

7. Click the **Save** icon.

8. Select the root of **Local Disk (C:)**.
9. Create a new folder named **Scripts**, and then save the script in that folder as **InstallWins.ps1**.
10. To run the script, press the F5 key.

Results: After completing this exercise, you should have used Windows PowerShell to perform a remote installation of features on multiple servers.

▶ Prepare for the next module

After you complete the lab, revert the virtual machines back to their initial state. To do this, complete the following steps:

1. On the host computer, switch to the Hyper-V Manager console.
2. In the **Virtual Machines** list, right click **20410C-LON-DC1**, and then click **Revert**.
3. In the **Revert Virtual Machine** dialog box, click **Revert**.
4. Repeat steps 2 and 3 for 20410C-LON-CORE and 20410C-LON-SVR3.