

PART I

Getting Started

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Getting Started with Windows Server 2012

IN THIS CHAPTER, YOU WILL LEARN TO:

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Every release of Windows Server has offered numerous features and functionality to assist administrators and companies with their day-to-day tasks. Each new release has offered plenty of new functionality but has also increased the administrative burden for the servers. Windows 2000 Server laid the foundation for Active Directory. Windows Server 2003 became the first dedicated server platform from Microsoft. Windows Server 2008 sought to offer server flexibility by providing role-based deployment including streamlined new roles such as Server Core.

Windows Server 2012 is a revolutionary release of the operating system. While Windows Server 2012 continues to build on prior releases, it delivers improvements to the Microsoft Windows Server platform. From the game-changing Hyper-V addition of shared-nothing live migration (you will learn more about that in Chapter 14, “Maintaining Your Virtual Servers”) to better server management capabilities (you can now easily manage multiple servers from one console) and improvements designed to work with Windows 8, Windows Server 2012 has a lot to offer.

However, even with the addition of all these capabilities, Windows Server 2012’s true benefits still are for administrators and were designed to improve the day-to-day tasks of administrators.

Before you begin to dig into the day-to-day improvements of administrative tasks, you should understand how the server was built so you can properly administer it. Do you need to install a new server? Do you need to perform an in-place upgrade? Do you migrate existing services such as DNS, Active Directory, or printers? These vital questions need to be answered so you can start to take advantage of the administrative improvements in Windows Server 2012. This chapter will take a brief look at planning, installing, and upgrading to Windows Server 2012. You will also learn about installing the migration tools.

Plan for Windows Server 2012

You have probably heard this phrase a thousand times (well, make this a thousand and one): “If you fail to plan, you plan to fail.” Having a solid idea what role the server will play is important to the health of IT as well as to your sanity. Some of the decisions you make during the planning process can impact the installation phase. If your planning is off, your installation will be off. Although fixing most installation

problems can be straightforward, some can become quite complex to fix, if not completely irreversible. Everyone has done the “FDISK, format, reboot” dance of destruction at least once to fix the wrong decisions.

In this section, you will look at the hardware requirements and recommendations for a Windows Server 2012 server installation. You will also learn about the roles and features that a Windows Server 2012 server can perform. In addition to the resources mentioned in this chapter, Microsoft offers several free tools to assist you in your planning process. These assessment tools are included in the Microsoft Assessment and Planning (MAP) Toolkit:

http://technet.microsoft.com/en-us/solutionaccelerators/dd537566.aspx?SA_CE=NOT-MAPBETA-SITE-TNETWINSVR-20090615

Understand Hardware Requirements

Like its predecessors, Windows Server 2012 offers numerous roles and editions of the server operating system. Just like Windows Server 2008 R2, Windows Server 2012 will be released only in *64-bit versions*. This means before you even start, you need to have the proper hardware to support the operating system. This requirement will also dictate upgrade and migration paths. Table 1.1 shows the base hardware requirements for Windows Server 2012.

Table 1.1: Windows Server 2012 Minimum Hardware Requirements

Resource	Requirement
Processor	1.4GHz x64 processor
Memory	512MB RAM
Drive space	32GB
Drive	DVD-ROM
Display and others	Super VGA 800 × 600 or higher Keyboard and mouse

These recommendations are the bare minimum needed to get the server up and running. See Table 1.2 for additional recommendations for processor memory and hard drive space. They will offer a base system with solid performance and flexibility for additional functions.

Table 1.2: Additional Hardware Recommendations

Resource	Recommendation
Processor	2GHz x64 dual-core processor
Memory	4GB RAM
Drive space	100GB

You should always look at the base requirements as the bare minimum to get the server operating system up and running. Generally speaking, these minimum requirements do not take into account the workload you will be placing on the server. You should always consider the roles and applications that will be loaded on the server. You should consider the recommendations and requirements for those applications as additional resources to those listed in Table 1.1. This will allow you to have servers that will perform satisfactorily and meet your needs, while having a little room to grow.

If the server is going to be used for virtualization workloads, ensure you have enough RAM and processor cores to support the Windows Server 2012 operating system as well as the virtual servers running on the server. How many servers, what types of servers, and what types of applications are all factors you need to review carefully when you're planning a virtualization server. One last note of concern for a virtualization server: Whether you choose VMware or Hyper-V virtualization technologies, make sure your processor hardware supports hardware-assisted virtualization. Either AMD Virtualization (AMD-V) or Intel Virtualization Technology (Intel VT) will work. These technologies typically also need to be enabled in the BIOS because they are generally not enabled by default. Enabling the virtualization normally requires a full hard reboot to take effect. Make sure you enable these technologies before installing your virtualization technology. In Chapter 14, you will learn more about Hyper-V.

Understand Windows Server 2012 Editions and Roles

Windows Server 2012 streamlined the number of editions to four. This book focuses on the Datacenter and Standard editions. One important note is that both editions (Datacenter and Standard) are technically the same; they both provide the full technical capability of the Windows Server 2012 platform. The difference between the Datacenter and

Standard editions involves licensing virtual operating systems. (We will cover those in the “Consider Your Licensing Options” section in this chapter.) Table 1.3 gives an overview of the Windows Server 2012 editions.

Table 1.3: Windows Server 2012 Editions

Edition	Overview
Datacenter	Designed for large-scale highly virtualized infrastructures. Ideal for public, private, and hybrid cloud deployments.
Standard	Designed for nonvirtualized environments where physical server deployment is preferred. Great for smaller infrastructures or branch offices.
Essentials	Geared toward small business environments. Includes built-in configurations to connect to cloud-based services. Limited to 25 users.
Foundation	Provides general-purpose Windows Server functionality. Limited to 15 users.

Once you have chosen the right edition for your needs, you need to look at the services the server will provide for your infrastructure. These services come in the form of *roles*. Windows Server 2012, like Windows Server 2008 R2, provides several server roles that can be installed on the server. A role is a set of software features and functions that provides services for your server and infrastructure. Some of these roles require additional planning to provide a stable and reliable environment.

Table 1.4 describes the server roles.

Table 1.4: Windows Server 2012 Server Roles

Role	Function
Active Directory Certificate Services (AD CS)	Allows for the creation of certificate authorities. This role allows you to host your own Public Key Infrastructure (PKI) on the server.
Active Directory Domain Services (AD DS)	Provides single sign-on (SSO) capabilities for your network and network services. This allows for the creation of objects (users, groups, computers, and so on) for use with network authentication and authorization.
Active Directory Federation Services (AD FS)	Provides single sign-on capabilities across multiple forests and domains. Additionally, this role provides web single sign-on.

Table 1.4: Windows Server 2012 Server Roles *(continued)*

Role	Function
Active Directory Lightweight Directory Services (AD LDS)	Commonly referred to as ADAM, this role is a lightweight version of AD DS. It allows for the storage of a base directory used for specific applications.
Active Directory Rights Management Services (AD RMS)	Allows you to provide authorization and verification services to users to access protected content.
Application Server	Provides the ability to have high-performance distributed applications (mainly applications that use the .NET Framework).
DHCP Server	Provides automatic TCP/IP address services for your network.
DNS Server	Provides name and service resolution services for TCP/IP networks. This is a core component for AD DS, and it is highly recommended you use this built-in service for your domain controllers.
Fax Server	Allows basic fax functions to be hosted on the server, such as sending, receiving, and reporting.
File and Storage Services	Provides many services for the file system, including replication, managing shares, and faster file searches. This role also provides services for UNIX clients to access files on the server.
Hyper-V	Provides the ability to create, manage, and perform live migration of virtual machines. Virtual machines operate on the host machine and are servers without the hardware.
Network Policy and Access Services	Provides resources for routing and remote access. This service also provides the framework for Network Access and Protection (NAP) and DirectAccess. Included in this service are two core components: Health Registration Authority and the Host Credential Authorization protocol.
Print and Document Services	Provides the ability for a centralized print server as well as management for printers. This service also installs the necessary Group Policy Objects (GPOs) for printer management through Group Policy.
Remote Access	Provides remote access services for your clients, from always-on Direct Access to traditional VPN. Additionally Remote Access provides routing capabilities such as Network Address Translation (NAT).

Role	Function
Remote Desktop Services	Provides the ability for your users to access the Remote Desktop Services on your server. These services provide presentation virtualization for your thin clients. Formerly called Terminal Services.
Volume Activation Services	Provides the server capability to manage licensing in your organization for Key Management Services or Directory Based Activation.
Web Server (IIS)	Provides the core infrastructure for a web server.
Windows Deployment Services	Installs the services for deploying Windows operating systems across the network.
Windows Update Services (WSUS)	Provides the management framework for Microsoft updates. This service allows you to deploy updates in a variety of options across your network.

NOTE Table 1.4 gives brief explanations of all the services available to Windows Server 2012. For more details, please take a look at Chapter 2, “Adding Server Roles and Functionality.” You can also get a more thorough explanation of the roles at <http://technet.microsoft.com/en-us/windowsserver/default.aspx>. In Windows Server 2012, some of the roles and features have been changed under the covers.

Understand Server Core

Windows Server 2012 Server Core is another installation option that is worth further mention. As in Windows Server 2008 and Windows Server 2008 R2, Windows Server 2012 Server Core is a very streamlined version of Windows Server. In Windows Server 2012, Server Core is now the default installation option. Server Core has limited functionality and runs a subset of the roles provided by Windows Server 2012. Server Core does not have a GUI. This means that all the administration is performed remotely or via a command prompt. Most importantly, the Server Core option is no longer a permanent installation-time decision; you can add the GUI back later if you want. Unlike Windows Server 2008 R2 (where you had to reinstall the server to remove the GUI), with Windows Server 2012 you can add and remove the GUI management tools easily.

This by no means implies that Server Core does not have usefulness in the network. The Server Core role provides a nice addition to your network without the overhead of a traditional server. This lowers the overall maintenance and security risks for the server. Server Core can also reduce the amount of patching that is required to keep the server up-to-date, and it is the Microsoft preferred installation for Windows Server 2012. The server provides support for these thirteen roles:

- DNS Server
- DHCP Server
- Active Directory Domain Services (AD DS)
- Active Directory Lightweight Directory Services (AD LDS)
- File Services (including File Server Resource Manager)
- Print and Document Services
- Web Server (IIS, including a subset of ASP.NET)
- Streaming Media Services
- Windows Server Update Server
- Active Directory Rights Management Server
- Active Directory Certificate Services (AD CS)
- Hyper-V
- Routing and Remote Access Server and the following subroles:
 - Remote Desktop Services Connection Broker
 - Licensing
 - Virtualization

Server Core is one of the two choices during installation, the other being a Full GUI installation. Additionally, you have a new option called Minimal Server Interface. The Minimal Server Interface provides graphical management tools and infrastructure for a hybrid management alternative.

Also in Windows Server 2012, if you install the full GUI, you can add additional desktop components via the Desktop Experience feature. In Table 1.5, you can see the components included in each of these choices.

Table 1.5: Windows Server 2012 Feature Availability by Installation Option

Feature	Server Core	Minimal Server Interface	Server with GUI	Desktop Experience Feature
Command Prompt	Available	Available	Available	Available
Windows PowerShell/ Microsoft .NET	Available	Available	Available	Available
Server Manager	N/A	Available	Available	Available
Microsoft Management Console (MMC)	N/A	Available	Available	Available
Control Panel	N/A	N/A	Available	Available
Control Panel applets	N/A	Some	Available	Available
Windows Explorer	N/A	N/A	Available	Available
Taskbar	N/A	N/A	Available	Available
Notification area	N/A	N/A	Available	Available
Internet Explorer	N/A	N/A	Available	Available
Built-in help system	N/A	N/A	Available	Available
Themes	N/A	N/A	N/A	Available
Windows 8 Shell	N/A	N/A	N/A	Available
Windows Store and support for Windows Store apps	N/A	N/A	N/A	Available
Windows Media Player	N/A	N/A	N/A	Available

In the “Perform a Windows Server 2012 Server Core Installation” section, you will see how to install these different options.

Consider Your Licensing Options

When you install Windows Server 2012 into your environment, you have to take into account the licensing. Windows Server 2012 for Standard and Datacenter are licensed per physical processor; each license covers two processors. For example, if your hardware comes with four processors, you will need two licenses to properly license the

server. Every Windows Server 2012 requires two types of licenses. First, you need a server license for the rights to run the operating system, and second, you need a client access license (CAL) to allow your clients to access the server. CALs come in two flavors:

- The *device* CAL allows access for one device for any user.
- The *user* CAL allows access for one user on any device.

Depending on your existing licensing, you may already be covered for Windows Server 2012. If Windows Server 2012 is solely used for virtualization servers, you do not need to have CALs for the host operating system. However, you will still need CALs for the guest operating systems running on the server. There is only one difference between the Windows Server 2012 Standard and Datacenter editions, and this is in regard to how you use virtualization technologies inside your network. Depending on which edition you have chosen (Standard or Datacenter), you may not need to purchase server licenses for your virtualized instances of Windows Server 2012. If you are using Windows Server 2012 Standard edition, you are allowed to run two virtualized instances of Windows Server 2012 under your server license. If you are using Windows Server 2012 Datacenter, you are allowed to run unlimited virtualized instances of Windows Server 2012 under your server license. For more details and specific license questions and pricing, contact your Microsoft reseller.

Install Windows Server 2012

After you plan your environment, it will be time to install Windows Server 2012. The installation process is fairly straightforward. This is mainly because of the role-based nature of Windows Server 2012. You will learn more about installing roles in Chapter 2.

Perform a Windows Server 2012 Full Installation

In this section, you will take a step-by-step look at the installation process for a Windows Server 2012 full installation. We'll cover the key decisions you need to be aware of as you install the operating system.

1. Insert the DVD media into the drive and reboot the system. Make sure your DVD is in the proper boot priority order so the DVD boots first. Upon reboot you will see the screen shown in Figure 1.1.

NOTE The DVD-ROM should hold boot priority over the HDD in this instance.

Figure 1.1: Selecting your language



2. Select your chosen language, time/currency, and keyboard method, and then click Next. You will see the screen shown in Figure 1.2.

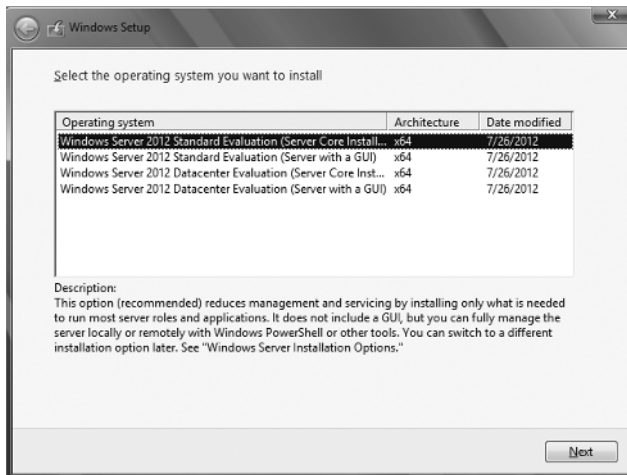
Figure 1.2: Starting the installation



This screen provides the option to install Windows Server 2012 by clicking the Install Now button. The Repair Your Computer option takes you to the repair and diagnostics functions of Windows Server 2012. To continue the installation, click the Install Now button.

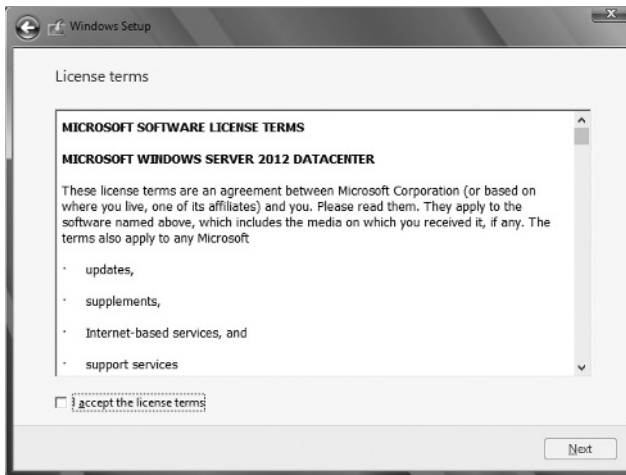
3. The next window you see (Figure 1.3) provides you with the choice to install your edition of Windows Server 2012. You can choose to install the Server with a GUI or the Server Core version. Select your version, and click Next. Here is the screen for the trial version of Windows Server 2012.

Figure 1.3: Selecting your Windows Server 2012 version

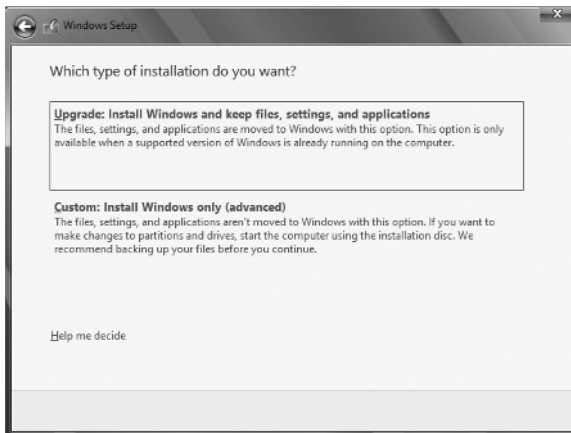


NOTE Depending on the version of Windows Server 2012 you are installing, you may not see the screen in Figure 1.3 initially. You may see a screen prompting you for a product key. After you type in the product key, you will see your installation options based on the key you entered.

4. Clicking the Next button takes you to the License Agreement screen. This screen, shown in Figure 1.4, allows you to read, print, and agree to the license terms. Select the check box on the bottom left of the dialog box to agree to the license terms, and click Next to continue.

Figure 1.4: Licensing terms

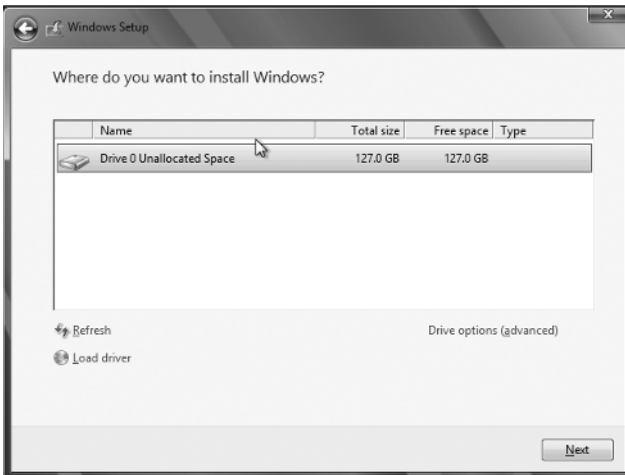
5. The screen shown in Figure 1.5 provides you with the choice between performing an upgrade or custom installation of Windows Server 2012. To perform a new installation, click Custom, and you will be taken to the next step.

Figure 1.5: Upgrading or customizing

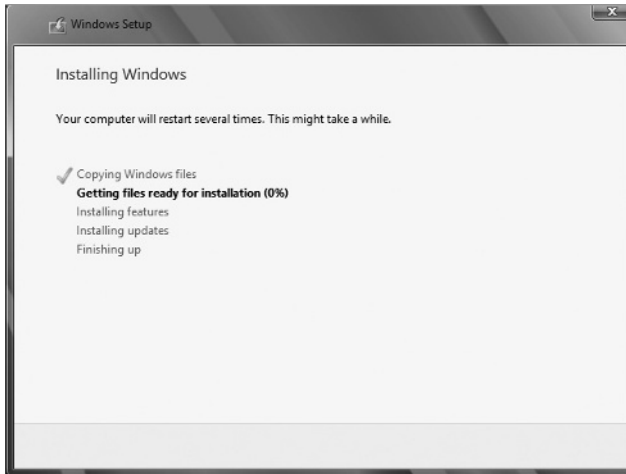
6. The next screen, displayed in Figure 1.6, allows you to choose the location for your Windows Server 2012 installation. This screen also allows you to load drivers for your SCSI hard drives.

If you are installing on a hard drive connected to a SCSI controller, select Load Driver, and insert the media with the drivers on it. You also have a full set of drive partitioning and formatting options, as shown in Figure 1.6. When you click the installation drive and click Drive options (advanced) for Windows Server 2012, you are presented with the options to create new partitions or delete, format, or extend existing partitions. Choose the appropriate option for your system, and click Next. If you do not select a partition and the only option you have is unallocated space, the Windows Server 2012 installation will create a partition on that drive by taking all the unallocated space and formatting it for you automatically with NTFS. Windows Server 2012 will also automatically make a system partition of 200MB in size during this step. The 200MB partition is not assigned a drive and will not be visible in the OS. The partition holds the Windows boot files for the Windows recovery environment (winRE).

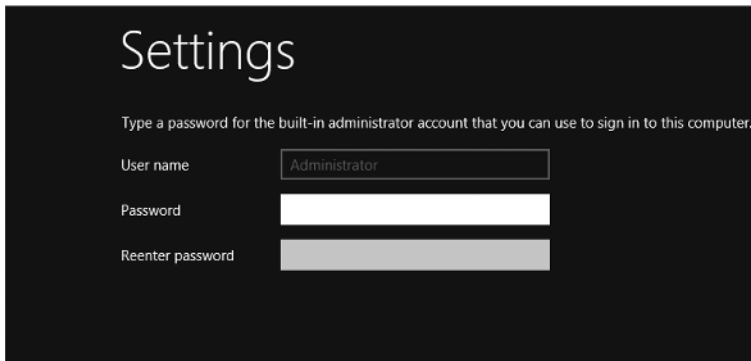
Figure 1.6: Selecting a drive and partition



7. When you select the partition you created, the installation will begin, and you will see a screen similar to Figure 1.7. The system may also reboot several times during this phase of installation.

Figure 1.7: Windows installation progress

8. After the final system reboot, you will be asked to configure the administrator's password, and you will see a screen similar to Figure 1.8.

Figure 1.8: Initial change of password logon

Set your administrator password. The password needs to be complex. This means the initial password needs to meet the following requirements:

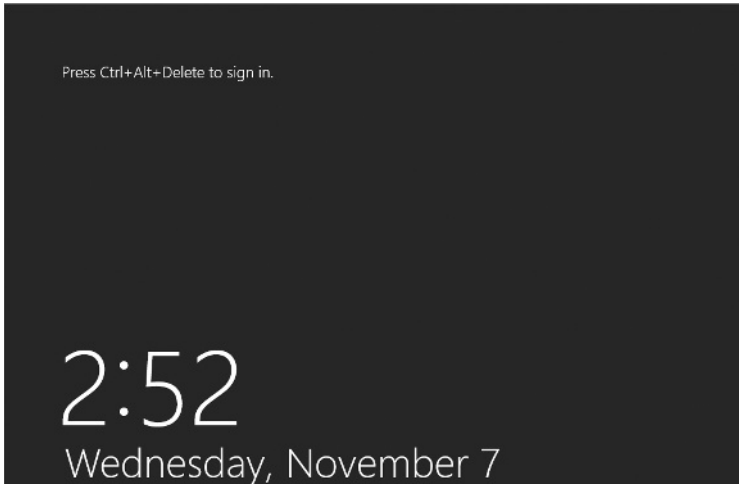
- Cannot contain the user's account name or parts of the user's full name that exceed two consecutive characters

- Be at least six characters in length
- Contain characters from three of the following four categories:
 - English uppercase characters (A through Z)
 - English lowercase characters (a through z)
 - Base 10 digits (0 through 9)
 - Nonalphabetic characters (for example, !, \$, #, or %)

There is also an option for you to create a password reset disk. By clicking this option, you can create a recovery disk, which allows you to create a new password for the user ID. You create this disk only once, no matter how many times the password for the account changes.

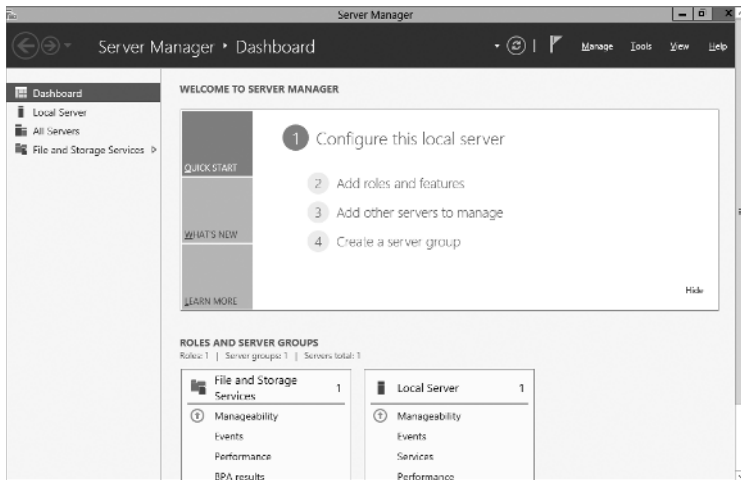
9. After you set the password, you will see a screen similar to Figure 1.9.

Figure 1.9: Logon window



After you have set the password, the Windows Server 2012 installation will complete, and you will see a new screen with the new version of Server Manager, as shown in Figure 1.10.

Figure 1.10: Server Manager



Perform a Windows Server 2012 Server Core Installation

Installing Windows Server 2012 Server Core follows a process similar to the previous steps. The only difference comes in step 3; here you would select Server Core Installation instead of Server with a GUI for your edition of Windows. You will learn how to add roles in Chapter 2.

Use *sconfig* to Configure Your Windows Server 2012 Server Core

After you install Windows Server 2012 Server Core, you need to configure the basics of the server, such as the network settings, computer name, domain membership, and so on. In prior versions of Windows Server, you had to be familiar with the netsh commands in configuring these aspects of Server Core.

Although you can still configure the Server Core installation with netsh commands as you may have done in the past, by default PowerShell is installed on a Windows Server 2012 core installation and you can begin your management with PowerShell. We will take a look

at PowerShell in Chapter 3, “Automating Administrative Tasks with Windows Server 2012.” You can also leverage Server Configuration. Server Configuration is a DOS-style menu configuration system that provides simple commands for configuring your server. This tool allows you to complete these common tasks easily. After you log on to Server Core, type **sconfig**. You will see a screen similar to Figure 1.11.

Figure 1.11: Server Configuration tool

```

Administrator: C:\Windows\system32\cmd.exe - sconfig
Microsoft (R) Windows Script Host Version 5.8
Copyright (C) Microsoft Corporation. All rights reserved.
Inspecting system...

=====
Server Configuration
=====

1) Domain/Workgroup:           Workgroup: WORKGROUP
2) Computer Name:             WIN2012CORE
3) Add Local Administrator
4) Configure Remote Management Enabled
5) Windows Update Settings:   Manual
6) Download and Install Updates
7) Remote Desktop:           Disabled

8) Network Settings
9) Date and Time
10) Help improve the product with CEIP Not participating
11) Windows Activation

12) Log Off User
13) Restart Server
14) Shut Down Server
15) Exit to Command Line

Enter number to select an option: _

```

As you can see, this tool is very easy to follow. For example, if you want to change the network settings after you have launched **sconfig**, press the 8 key to configure the settings. Then you will just need to follow the menu screens to finish the configuration.

If you do not want to use **sconfig**, PowerShell, or the command prompt, you can add the GUI management components. Adding the GUI management components provides an easy and familiar way to add and remove server roles and features. What makes Server Core great in Windows Server 2012 is that you can add the GUI, configure the server, and then easily remove it.

To start a PowerShell on a Server Core, type **PowerShell** at the command prompt. To install the GUI features, you will first need to mount the installation files:

1. Make a mount directory for the installation files. From within a PowerShell session, type **Mkdir c:\mount**.

2. Mount the source files, In this example, the files are mounted from the Windows Server 2012 installation in the D: drive. By default, you can use index 1:

```
Mount -WindowsImage -ImagePath d:\sources\install.wim  
-Index 1 -Path c:\mount -readonly
```

Once you have mounted the files, you can use one of the two commands to install the GUI components:

- To Install the full Windows Server 2012 GUI, run the following PowerShell command:

```
Install-WindowsFeature Server-Gui-Mgmt-Infra,  
Server-Gui-Shell -Restart -Source c:\mount\windows\winsxs
```

- To Install the Minimal Server Interface, run the following PowerShell command:

```
Install-WindowsFeature Server-Gui-Mgmt-Infra  
-Restart -Source c:\mount\windows\winsxs
```

Likewise, if you have installed a full server GUI, you can also remove the GUI and convert your installation to a Windows Server Core installation. You do that by using the Remove Roles and Features Wizard. To remove the GUI, follow these steps:

1. Open Server Manager from the Start screen.
2. Click Manage on the top toolbar.
3. Click Remove Roles and Features.
4. Click Next on the default page.
5. Select the local server from which you want to remove the GUI and click Next.
6. On the Server Roles page, click Next.
7. On the Features page, find User Interfaces and Infrastructure.
8. Expand the User Interfaces and Infrastructure.
9. To remove the full server GUI, deselect Graphical Management Tools and Infrastructure and Server Graphical Shell and then click Next.
10. Verify the information on the Confirm installation selections screen and then click Remove.
11. Verify the results and then click OK. Your server will need to be restarted to complete the conversion to Server Core.

Activating Windows Server Core

When you install Windows Server 2012 on a server with a GUI installation or Server Core, you must activate the operating system to ensure you have a valid product. Activation also enables your copy of Windows Server 2012 to function properly. On a full server installation, the Activate Windows Wizard is located in the Control Panel. This simple wizard takes you step-by-step through the process. However, there is no wizard in a Server Core installation of Windows Server 2012, so you will have to run one of the following two commands to activate the operating system.

- If you entered the product key for your Server Core installation during the install process, run this script:

```
cscript C:\windows\system32\slmgr.vbs -ato
```

- If you did not enter the key during the install process, run the following command:

```
cscript C:\windows\system32\slmgr.vbs -ipk <product key>
```

When the script finishes execution, run this command to activate Windows:

```
cscript C:\windows\system32\slmgr.vbs -ato
```

Upgrade to Windows Server 2012

Upgrading to Windows Server 2012 can require some additional planning and consideration because Windows Server 2012 is released only in 64-bit versions. You cannot upgrade an x86-based system to Windows Server 2012. You can only perform a migration, which will be covered in the next section. Your current operating system and edition will determine the proper path for your upgrade. However, when you perform an upgrade, the process is really an in-place migration under the covers. Table 1.6 shows the paths you can take. If your current operating system is not listed, it is not supported.

Table 1.6: Upgrade Paths

Existing Windows Operating System	Windows Server 2012 Upgrade Options
Windows Server 2008 Standard with SP2 or Windows Server 2008 Enterprise with SP2	Windows Server 2012 Standard, Windows Server 2012 Datacenter
Windows Server 2008 Datacenter with SP2	Windows Server 2012 Datacenter
Windows Web Server 2008	Windows Server 2012 Standard
Windows Server 2008 R2 Standard with SP1 or Windows Server 2008 R2 Enterprise with SP1	Windows Server 2012 Standard, Windows Server 2012 Datacenter
Windows Server 2008 R2 Datacenter with SP1	Windows Server 2012 Datacenter
Windows Web Server 2008 R2	Windows Server 2012 Standard

Performing an in-place upgrade is a destructive process in a sense. You are replacing the existing server operating system with the new one—and this is a one-way street. If the upgrade process goes awry, you will incur downtime until you resolve the issue and restore your system. Before you perform any upgrade or migration, back up your existing server operating system and data. To perform an in-place upgrade, follow these steps:

1. Insert the DVD media into the drive. The screen shown in Figure 1.1 displays.
2. When you click **Install Now**, you will be presented with a couple of choices, as shown in Figure 1.12. You can choose to participate in the Microsoft Customer Experience program by selecting **I Want To Help Make Windows Installation Better**. This program helps Microsoft identify trends for successful and unsuccessful installations and determine which updates are needed. Choosing to participate is strictly optional. You can learn more about the program by clicking **What Information Will Be Sent To Microsoft?**

Figure 1.12: Installation updates

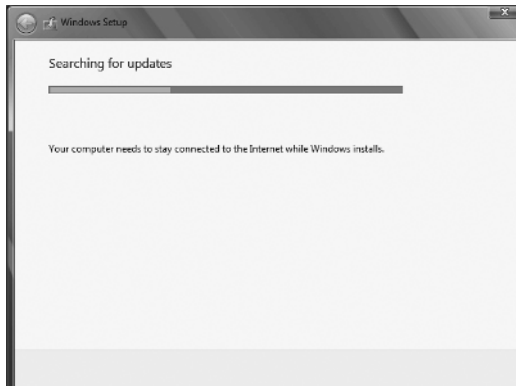


You will also be presented with a choice to upgrade your installation files. You should always choose to update them; the following updates are included in this choice:

- Installation updates
- Driver updates
- Windows updates
- Microsoft Windows Malicious Software Removal Tool updates

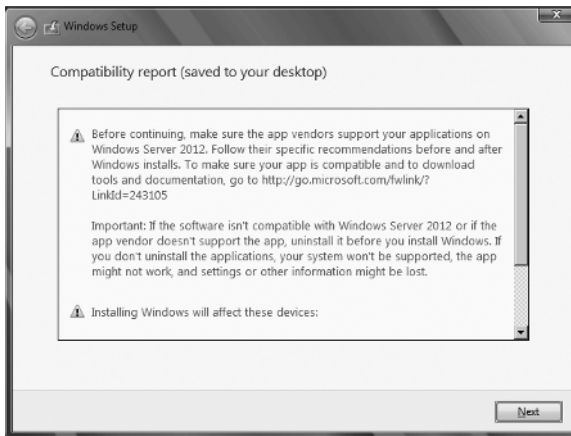
If you choose to go online and update your installation, you will see a screen similar to Figure 1.13 while downloading the updates. After you're done downloading them, or if you choose not to update the installation, you will proceed to the next step.

Figure 1.13: Update installation progress



3. The next step provides you with the choice to install the edition of Windows Server 2012. You can choose to install the full edition of Windows Server 2012 or the Server Core version. Select your version, and click Next.
4. When the License Agreement screen appears, you can read, print, and agree to the license terms. Select the check box on the bottom left of the dialog box to agree to the license terms, and click Next to continue.
5. The next step offers you the choice between performing an upgrade or custom installation of Windows Server 2012. To proceed to the next step of the upgrade, you need to choose the upgrade option.
6. The Windows Server 2012 installation will perform a compatibility check, and you will see a screen similar to Figure 1.14. The report will be saved to your desktop, and you will see what devices will be affected by the Windows Server 2012 upgrade. Click Next to continue.

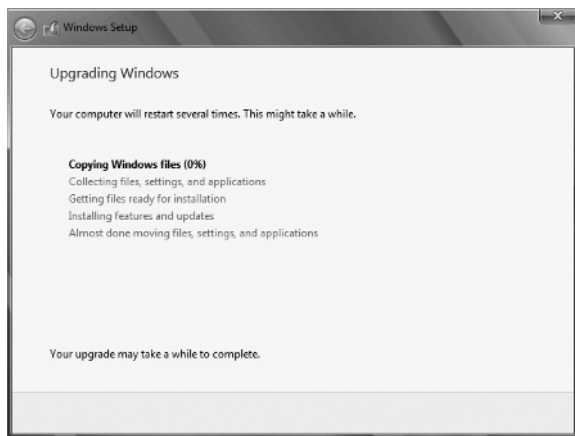
Figure 1.14: Compatibility report



7. The Windows Server 2012 upgrade will continue to the next step, and you will see a screen similar to Figure 1.15. During this phase

of installation, all the necessary files, settings, and programs needed for the upgrade will be collected and analyzed. The system may also reboot several times during this phase of installation.

Figure 1.15: Upgrading Windows progress



8. After the final system reboot, the upgrade will be complete, and you will be presented with a Login screen. Log in, and you will finish the upgrade. You can also review the compatibility report again; it is located on the desktop. The file will be called `Windows Compatibility Report.htm`.

Install Windows Server 2012 Server Unattended

You can also perform an unattended installation of Windows Server 2012. This provides a useful method to rapidly deploy new servers in your environment. Unattended installs are completed by creating an answer file. The answer file is the file containing the main configurations for the Windows Server 2012 installation. Settings can include application configuration, such as configuring the home page in Internet Explorer and controlling the desktop look-and-feel settings. To create an answer file, you first need to install the Windows Automated Installation Kit (WAIC). The WAIC is available in the MDT Toolkit, located here:

<http://www.microsoft.com/en-us/download/details.aspx?id=25175>

After you download the MDT, install the tool by clicking the MSI file and step through the wizard, accepting the defaults.

Install the WAIK

The WAIK is a flexibility utility tool that allows you to customize your Windows Server installs. You can also create the necessary files to assist with configuration and deployments. To install the WAIK, you need to install the .NET framework feature. You can find it in the Add Roles and Features Wizard in Server Manager.

1. Open Server Manager.
2. Click Dashboard.
3. Click Add Roles And Features.
4. Click Next on the default page.
5. Select Role-based or feature-based installation and click Next.
6. Select the local server and click Next.
7. On the Server Roles page, click Next.
8. On the Features page, find .NET Framework 3.5 Features.
9. Expand the .NET Framework 3.5 Features.
10. Select .NET Framework 3.5 Features (includes .NET 2.0 and 3.0) and click Next.
11. Verify your selection on the Confirm installation selections screen and click Install.
12. Verify the results and click OK. The server may need to be restarted to complete the installation.

After you have installed the MDT, go to the Start screen, begin typing **Deployment Workbench**, and then click the Deployment Workbench icon in the results.

Where's the Start Menu?

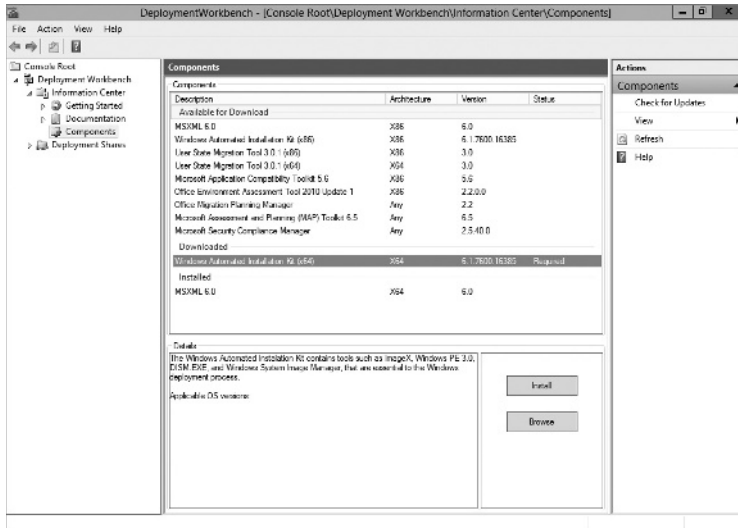
You might have noticed that Windows Server 2012 has no Start menu. When you press the Windows key on your keyboard, a screen similar to the one shown here appears.



Although you probably will not use the Start screen very frequently, you might have to venture into it. If you do, my advice is to just type what you want to find. The Start screen has built-in search capabilities and, when you start typing, you'll get a list of applications installed on the server. For example, if you are looking for the Administrative Tools group, just start typing **administrative tools** and see what happens. Alternatively, type **cmd** and see what happens. You will find the Start screen is useful, but for server management, you probably will not need to look any further than the new Server Manager. (You'll learn about Server Manager at the end of this chapter. You're going to love it!)

1. In the Navigation pane of Deployment Workbench, expand the Deployment Workbench and then expand the Information Center.
2. Select Components and then select Windows AIK from the Components pane.
3. Click Windows AIK to download the files. After the files (approximately 1GB) are downloaded, you should see a screen similar to Figure 1.16. Click Install.

Figure 1.16: Welcome to WAIK



4. Click Next on the Welcome screen.
5. Click Next after you accept the license agreement.
6. Pick a drive and directory for the tools. (The tools require about 1.2GB of drive space.) Then click Next.
7. Click Next to begin to the installation, and click Close on the final screen.

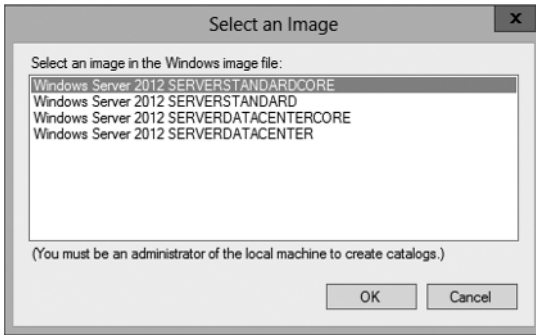
Create an Answer File

After you have installed the WAIK tools, your next step is to create an answer file. The file contains configuration settings for Windows and provides the settings to your preferred desktop. To create an answer file, you will use the Windows System Image Manager (SIM). Before you create an answer file, you will need to load the `install.wim` file from the Windows Server 2012 DVD. The file is located in the sources directory. Copy the file to a local directory—for example, `c:\source`.

1. Start Windows SIM by going to the Start screen and typing **Windows System Image Manager**, and select it when it appears in the results list.
2. In Windows SIM, select **File > Select Windows Image**, and navigate to the directory that contains the `install.wim` file.

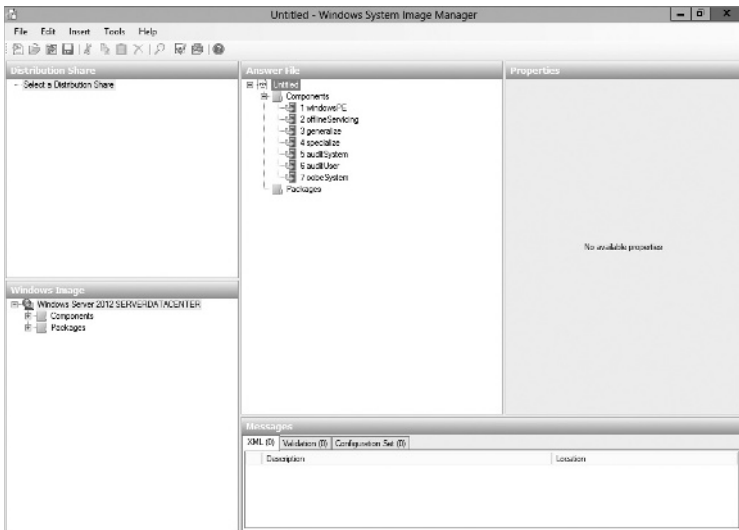
3. After you select the `install.wim` file you located in step 2, you will be presented with the dialog box shown in Figure 1.17. Choose the edition of Windows Server 2012 for which you are creating the answer file and click OK.

Figure 1.17: Windows image selection



4. After you select the edition, you will be asked to create a catalog file; click Yes. This process can take several minutes.
5. Choose File > New Answer File, and your screen will look similar to Figure 1.18.

Figure 1.18: WAIK



6. You will need to add and configure the many settings that fit your needs. For more information on configuring the settings, see the help file that comes with the WAIK toolset (`waik.chm`).
7. When you are done modifying settings in the answer file, you will need to save the file. Select **File > Save Answer File**. During the save process, the SIM tool will start a validation process. The Validation tool ensures that your answer file is correctly formatted and the settings are properly configured. Before you save, you can also validate the file by selecting **Tools > Validate Answer File**.
8. Save the answer file with the name **Autounattend.xml**.

Install Windows Server 2012 Unattended

After you have an answer file, it is time to install Windows. The previous process is good for single-server deployments. However, the WAIK tools also provide resources for many deployment methods. The WAIK toolset provides many tools to quickly deploy multiple servers via a variety of sources. You will learn the DVD method to deploy Windows Server 2012 unattended.

1. Copy your answer file (`Autounattend.xml`) to a disc or USB flash drive (UFD).
2. Insert your UFD and your Windows Server 2012 DVD into the server you want to install.
3. The Windows Server 2012 setup program automatically checks the removable media for a file called `Autounattend.xml`.
4. After the installation is complete, make sure your settings were properly installed.
5. Lastly, you need to *reseal* the system by running this command:

```
c:\windows\system32\sysprep\sysprep.exe /oobe /  
generalize /shutdown
```

Resealing the system removes hardware-specific and unique system information. This is required if you plan to redeploy the image and properly ready the system for users.

Migrate to Windows Server 2012

Performing a server migration instead of an in-place upgrade has some advantages you should consider. Performing a migration does require two servers; however, this is one of the advantages. On the server you will be migrating to, you will perform a clean install of Windows Server 2012, and clean installations exhibit more stability than upgraded servers. Migrations also reduce the risk of downtime in your server environment and offer a fallback plan. During migration, the server being migrated from is still running, and if the migration fails, you can start all over with the new server without impacting your environment. Lastly, migration allows you to do performance and benchmark testing prior to fully completing the migration.

Windows Server 2012 migration can be used successfully in these three scenarios:

x86 to x64 scenarios As mentioned earlier, Windows Server 2012 is available only in 64-bit. Migration is the only method for the x86 hardware.

Virtual server to physical server and physical server to virtual server If you are looking to virtualization for some of your server components in your current environment, then migration is the way to go. Likewise, if you are looking to move some of your virtual servers to the physical systems, migration offers another great pathway for you.

Core Server to full server and full server to Core Server As mentioned in Table 1.6, you can perform this type of upgrade only on Windows Server 2012 servers. Migration is the only way to move from a Server Core installation to a full installation of Windows Server 2012. You can also turn a full server into a Server Core through this process. However, make sure the roles on the full server are supported by Server Core.

Migration can be from x86 or x64 systems and supports the following source operating systems:

- Windows Server 2003
- Windows Server 2003 R2
- Windows Server 2008 (full server only)
- Windows Server 2008 R2 (full server or Server Core)

NOTE Windows 2008 Server Core is not supported for migration because Server Core has no .NET Framework support. Additionally, the system language on both the source and the target have to be the same. For example, if the source server's system language is English and the target server is in Spanish, then the migration tools will not work.

Migration can be performed for the following roles, features, settings, and data:

- Active Directory Domain Services (AD DS)
- DNS
- DHCP
- File Services
- Print Services
- BranchCache
- IP configuration
- Local Users and Groups

Prior to performing the migration, you need to install the Windows Server 2012 migration tools.

Install Windows Server 2012 Migration Tools

The migration tools are new and provide a much improved resource for successfully migrating your environment. You will install the migration tools first on the target Windows Server 2012 server and then on the source server. Prior to installing the migration tools, make sure the source servers meet the system requirements listed in Table 1.7, and verify you are, at the minimum, a member of the Administrators group on both the target and source servers.

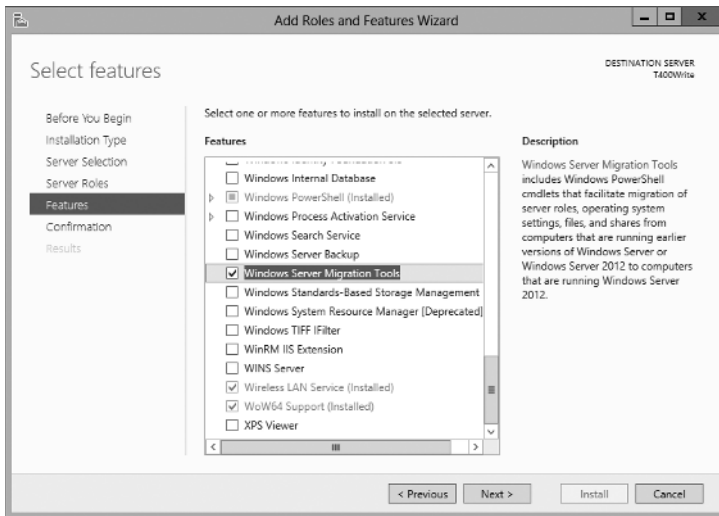
Table 1.7: Migration Tool System Requirements

Source Server OS	Requirements
Windows Server 2003 or Windows Server 2003 R2	25MB free drive space, .NET Framework 2.0, Windows PowerShell 1.0 or later
Windows Server 2008, 2008 R2, or 2012	23MB free drive space, Windows PowerShell or the Server Manager command-line tool (ServerManagerCmd.exe)

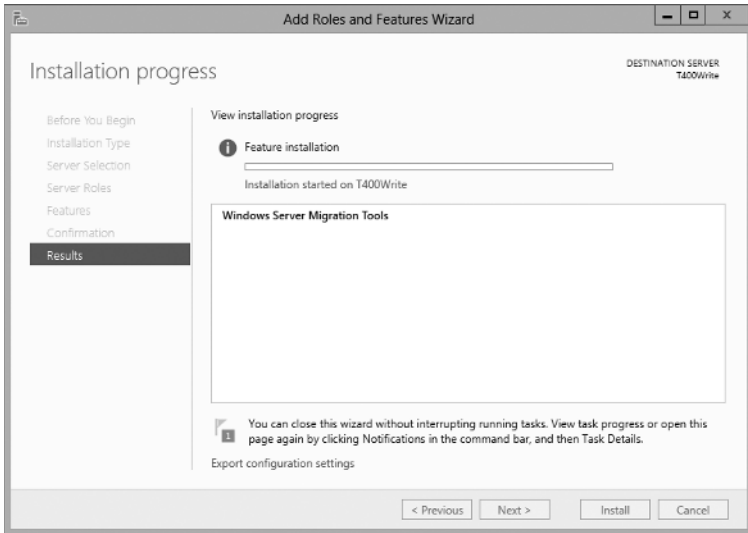
First, install the migration tools on the Windows Server 2012 target server. After the tools are installed on the target server, create deployment folders on the target server for the source server. Lastly, to complete the installation, register the Windows Server migration tools on the source servers. You will see how to install the tools via Server Manager:

1. Open Server Manager (you can also install the tools via PowerShell if you are running Windows Server 2012 Server Core) on the target server, click Dashboard and select Add Roles And Features.
2. Click Next on default page.
3. Select Role-based or feature-based installation and click Next.
4. Select the local server and then click Next.
5. On the Server Roles page, click Next.
6. On the Features menu, you may need to scroll down to select Windows Server Migration Tools. You will see a screen similar to Figure 1.19. After you select Windows Server Migration Tools, click Next.

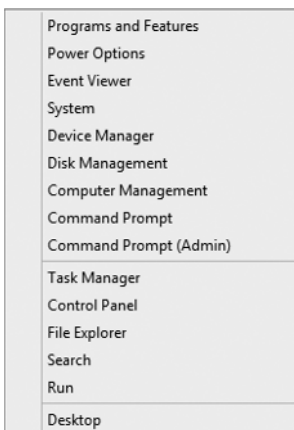
Figure 1.19: Migration features



7. Verify the Confirm installation selections screen and click Install. You will see a screen similar to Figure 1.20.

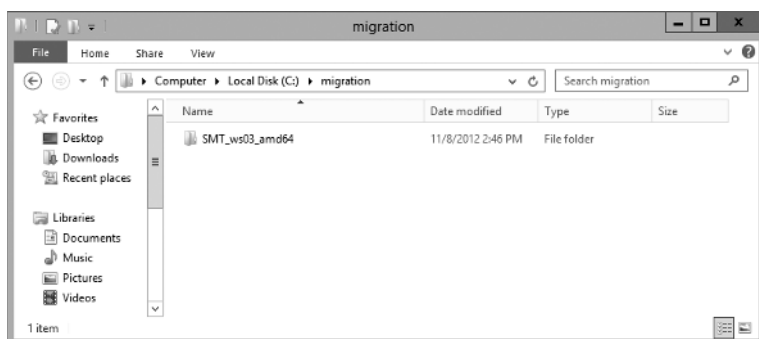
Figure 1.20: Windows Server Migration Tools confirmation

8. Verify the results and click OK. The server may need to be restarted to complete the installation.
9. After the tools are installed, create the deployment folders on the target computer. To do this, first you need to open an administrator command prompt. Move your mouse to the lower left of the screen and right-click. You will see a menu similar to Figure 1.21. Select Command Prompt (Admin).

Figure 1.21: Selecting Command Prompt (Admin)

10. Create a deployment folder on the target computer to hold the migration tools; the following examples use `c:\migration`. This folder can also be a network path.
11. In the Command Prompt window, change to the Server Migration Tools directory. The directory by default is located at `c:\windows\system32\ServerMigrationTools\` (if you installed to the default directory on the C: drive). To get there quickly, you can enter the command `cd %windir%\system32\servermigrationtools\` and press Enter.
12. Depending on what architecture and operating system your source system is running, you will need to run one of the following commands. The command creates a directory with the migration tools in it, as in Figure 1.22, which shows a directory created for a 64-bit version of Windows 2003 with the name of `SMT_ws03_amd64`.

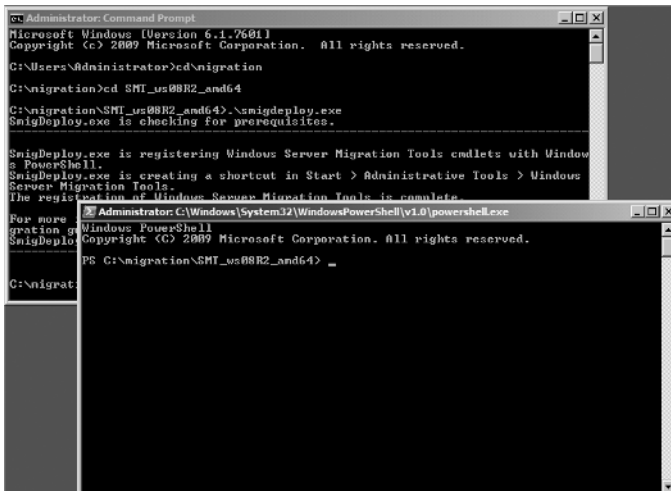
Figure 1.22: Windows migration directory



- If your server is 64-bit Windows Server 2003, type the following command and press Enter:
`SmigDeploy.exe /package /architecture amd64 /os WS03 /path c:\migration`
- If your server is 64-bit Windows Server 2008, type the following command and press Enter:
`SmigDeploy.exe /package /architecture amd64 /os WS08 /path c:\migration`
- If your server is x86 Windows Server 2003, type the following command and press Enter:
`SmigDeploy.exe /package /architecture X86 /os WS03/path c:\migration`

- If your server is x86 Windows Server 2008, type the following command and press Enter:
`SmigDeploy.exe /package/ /architecture X86 /os WS08 / path c:\migration`
 - If your server is Windows Server 2008 R2, type the following command and press Enter:
`SmigDeploy.exe /package /architecture amd64 /os WS08R2 / path c:\migration`
13. Copy the folder created in step 10 to a local directory on the source computer so you can register the tools with the source server.
 14. On the source server, open a command prompt. If the server is Windows Server 2003, just run the command. However, if the source server is Windows Server 2008 or 2008 R2, you will need to run an elevated command prompt. To do that, select Start > All Programs > Accessories, right-click Command Prompt, and select Run As Administrator.
 15. Change to the directory to which you copied the files in step 13.
 16. Type `.\Smigdeploy.exe`, and press Enter to register the tools. When this command is complete, you will see a status message, and a Windows PowerShell window will open. You will see a screen similar to Figure 1.23.

Figure 1.23: Windows migration install



After you install the migration tools, it will be time to perform the migration.

Migrate to Windows Server 2012

Regardless of the feature or role you will be migrating to Windows Server 2012, you will follow three general steps after you install Windows Server 2012 on the new target server:

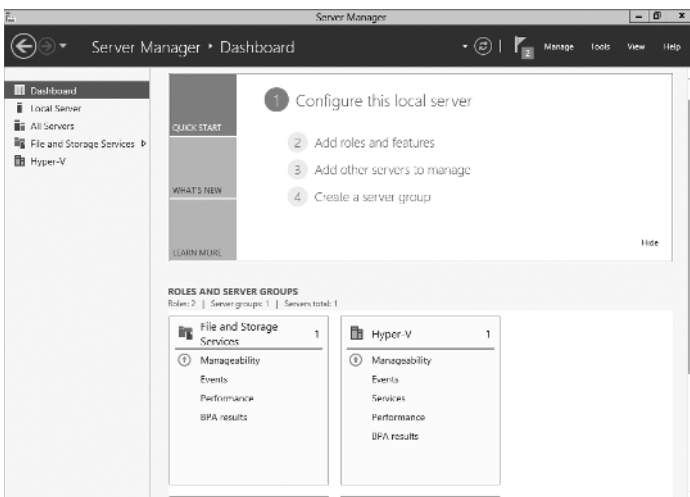
1. Export the settings from the source server to temporary storage.
2. Import the settings to the target server from temporary storage.
3. Transfer any data and shares from the source server to the target server.

A New Server Manager

One of the new tools you will first see in your Windows Server 2012 installations is Server Manager. This tool will change not only how you manage your local server but all of the servers in your infrastructure. Throughout this book, you will see Server Manager in action; in this section, you will get a brief tour of the tool.

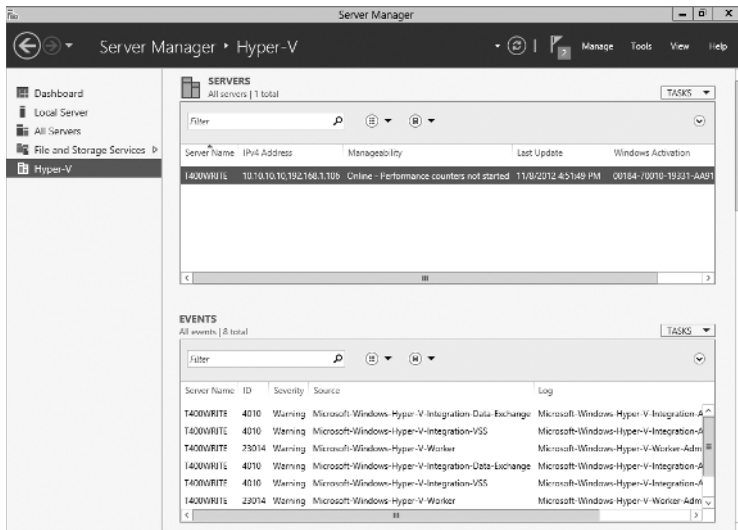
One of the first things you will notice about the new Server Manager is the Dashboard. The Dashboard is where you can get a quick glimpse of your server environment. You can see an example in Figure 1.24.

Figure 1.24: Server Manager



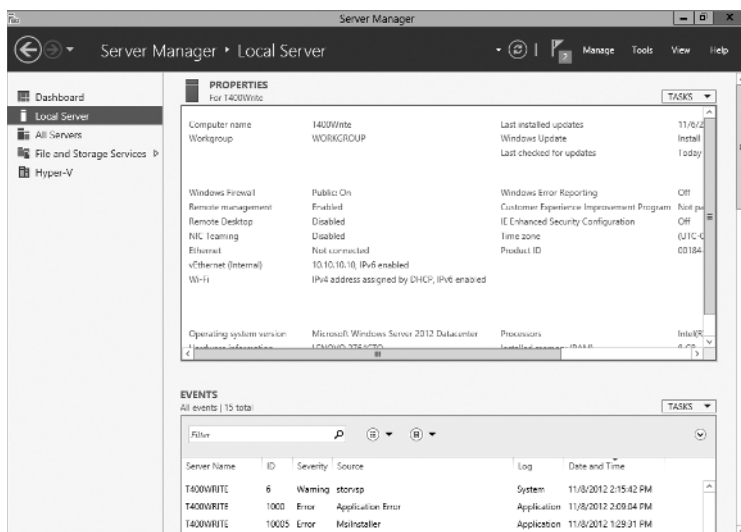
In the Dashboard, you see the status of all the servers and their respective installed roles. This is designed to save you time and administrative effort. If the category in the Roles and Server groups is green, then all systems are normal. If the category is red, then you most likely have some issues. From the Dashboard, you can quickly jump to the status of the roles by clicking the role (or by clicking the role name on the left-hand navigation tree). You then will be taken to a screen that will show you events, best practice analyzer results, a listing of servers running the role, performance counters, and even a snapshot of the services that support the role. You can see an example of the Hyper-V role in Figure 1.25. Also from the Dashboard, you can quickly configure the local server, add roles and features, add servers to manage, and create groups to manage your server right from the Dashboard.

Figure 1.25: Hyper-V in Server Manager



Let's take a look at managing some of the aspects of your local server. When you click Local Server on the Navigation pane or Configure Local Server on the home page of the Dashboard, you will see a screen similar to Figure 1.26.

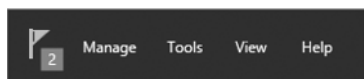
Figure 1.26: Configure Local Server



As you can see, all the common tasks for server management are listed and have links to quickly manage those aspects. From changing the name of your server or configuring the IP address to a quick overview of the hardware, this central location allows you to quickly manage the server.

One very important aspect of the Server Manager is the top-right menu bar shown in Figure 1.27.

Figure 1.27: Server Manager menu bar



This menu bar provides three menus that offer the key to successfully managing your servers. The first menu, represented by the flag icon, is the Action Center. Click the icon to display a list of recent events, such as a successful installation or additional steps taken after a role installation. You might also see potential issues here.

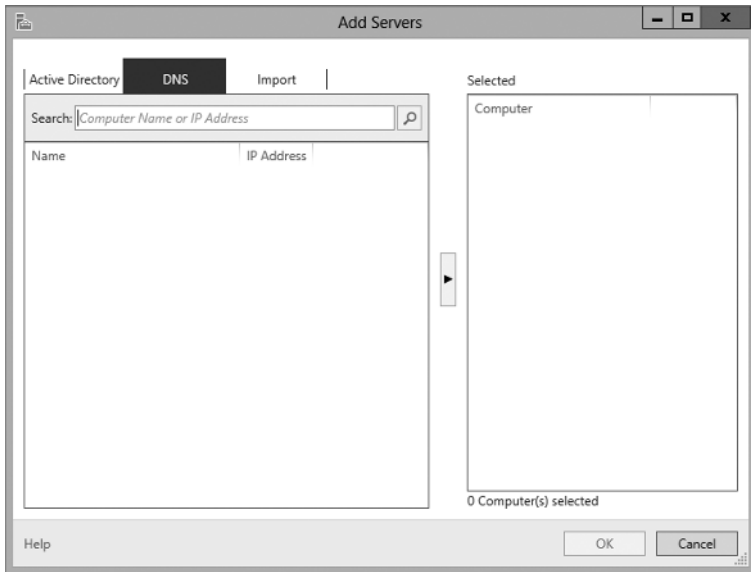
The next menu item is labeled Manage. From this menu, you can add and remove server roles and features, add servers, create a server group, and configure basic properties of the server manager.

The last menu item, Tools, is probably going to be one of your favorites. Click Tools to access all of the available administrative tools. Essentially, the Tools menu is the Administrative Tools group from previous server environments.

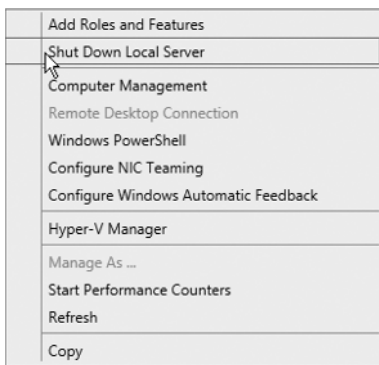
Now, with Server Manager, you can manage multiple servers. To do that, you need to add the servers you want to manage. (Make sure you have administrative privileges on the servers you add.) You can add servers using any of the three following methods:

- Active Directory
- DNS
- Import
 - To add a server, you can either right-click All Servers or click the Manage menu and select Add Servers. When you have done so, you will see a screen similar to Figure 1.28.

Figure 1.28: Add Servers Via DNS



Then choose the appropriate method for your infrastructure, click OK, and the server will be added to the server list. One of Server Manager's hidden gems is that once the server is added to the list, you have a great shortcut menu to manage the server. When you right-click the server, you will see a screen similar to Figure 1.29.

Figure 1.29: Server Management shortcut menu

Not only can you add and remove roles and features remotely, you can also open a remote desktop connection to the server. You can create groups that will allow you to organize your servers. By going to the Manage menu on the menu bar, you can also select Create Server Group to create a group of servers you can easily access and manage. After you create the server group you can then add all the servers you want to manage; they will be grouped in the right-side navigational tree.

In this section, you just took a quick tour of the Server Manager. Do not be afraid to explore the different options as you add roles or additional functionality to your server. Throughout the rest of this book, you will see the Server Manager in action and learn how this tool provides access to all of your server management needs.