

Chapter 2

Installing Windows 7

In this chapter you'll learn how to install Windows 7 because, as you already know, before you can master any Microsoft product, you must first know how to properly install it.

Preparing for the installation of Windows 7 involves making sure that your hardware meets the minimum requirements and that it's supported by the operating system. Another consideration is whether you're going to upgrade from a previous version of Windows or install a clean copy on your computer. An upgrade attempts to preserve existing settings; a clean install puts a fresh copy of the operating system on your computer. Installation preparation also involves making choices about your system's configuration, such as selecting a disk-partitioning scheme.

To complete the Windows 7 installation, you need to activate the product through Windows Activation. This process is used to reduce software piracy. After Windows 7 is installed, you can keep the operating system up-to-date with postinstallation updates.

Also consider whether the computer will be used for dual-boot or multiboot purposes. Dual-booting or multibooting allows you to have your computer boot with operating systems other than Windows 7.

After you complete all the planning, you are ready to install Windows 7. This is a straightforward process that's highly automated and user friendly.

In this chapter, you'll learn how to:

- ◆ Determine the hardware requirements for Windows 7
- ◆ Determine which version of Windows 7 to install
- ◆ Install the Windows 7 operating system
- ◆ Migrate users from Windows XP to Windows 7

Preparing to Install Windows 7

Installing Windows 7 is simple thanks to the installation wizard. The wizard walks you through the entire installation of the operating system.

The hardest part of installing Windows 7 is preparing and planning for the installation. An hour of planning will save you days of work. Planning a Windows 7 rollout is one of the most important tasks that you will perform when you install Windows 7.

You must make many decisions before you insert the Windows 7 media into your machine. The first decision is which edition of Windows 7 you want to install.

Users' job functions or requirements may determine which edition of Windows 7 you should use. Do they need their computer for home use or just work? These are some of the factors that you'll take into account when deciding which edition to install. Let's take a look at the various editions of Windows 7.

Windows 7 Editions

Microsoft offers six editions of the Windows 7 operating system. This allows an administrator to custom-fit a user's hardware and job function to the appropriate edition:

- ◆ Windows 7 Starter
- ◆ Windows 7 Home Basic
- ◆ Windows 7 Home Premium
- ◆ Windows 7 Professional
- ◆ Windows 7 Enterprise
- ◆ Windows 7 Ultimate

Many times Microsoft releases multiple editions of the operating system contained within the same Windows 7 media disk. You can choose to unlock the one that you want based on the product key that you have. Let's take a closer look at the various editions of Windows 7.

WINDOWS 7 STARTER

The Windows 7 Starter Edition was designed for small notebook PCs and is now available worldwide. This is a change from the previous versions of the Windows Starter Editions. Previously, the Starter Editions were only available to certain locations. Windows 7 Starter Edition has some features that will work well on small notebook PCs, such as:

- ◆ A safe, reliable, and supported operating system
- ◆ HomeGroup, which allows a user to easily share media, documents, and printers across multiple PCs in homes or offices without a domain
- ◆ Improved Windows Taskbar and Jump Lists over Windows Vista.
- ◆ Broad application and device compatibility with unlimited concurrent applications

THREE CONCURRENT APPLICATIONS RESTRICTION

Currently, the three concurrent applications restriction was removed. If you plan on using the Windows 7 Starter Edition, check Microsoft's website at www.microsoft.com/windows7 for any possible changes to this restriction.

The Windows 7 Starter Edition has many limitations and *excludes* the following features:

- ◆ Aero Glass; you are only allowed to use the Windows Basic or other opaque themes. Also, you can't use the Taskbar Previews or Aero Peek.

- ◆ Personalization features that allow you to change desktop backgrounds, window colors, or sound schemes.
- ◆ The ability to easily switch between users. You must log off to change users.
- ◆ Multimonitor support.
- ◆ DVD playback or Windows Media Center for watching recorded TV or other media
- ◆ Remote Media Streaming for streaming your videos, music, and recorded TV from your home computer.
- ◆ Domain support for business customers.
- ◆ XP Mode for those who want the ability to run older Windows XP programs on Windows 7.

WINDOWS 7 HOME BASIC

The Windows 7 Home Basic Edition will be issued to limited areas throughout the world only. Currently, the Home Basic Edition is not available to US customers. Only emerging markets will be able to purchase the Home Basic Edition so that they can have an inexpensive edition of Windows 7. The Home Basic Edition has some of the following features:

- ◆ Broad application and device compatibility with unlimited concurrent applications
- ◆ A safe, reliable, and supported operating system
- ◆ The ability to share media, documents, and printers using HomeGroup without a domain
- ◆ Improved Taskbar and Jump Lists from Windows Vista.
- ◆ Live thumbnail previews and an enhanced visual experience
- ◆ Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- ◆ Windows Mobility Center (shows the most frequently used mobile settings in a single location).

WINDOWS 7 HOME PREMIUM

Windows 7 Home Premium is the main operating system for the home user. Windows 7 Home Premium offers many features, including:

- ◆ Broad application and device compatibility with unlimited concurrent applications
- ◆ A safe, reliable, and supported operating system
- ◆ HomeGroup, which offers the ability to share media, documents, and printers without a domain
- ◆ Improved Taskbar and Jump Lists over Windows Vista
- ◆ Live thumbnail previews and an enhanced visual experience
- ◆ Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- ◆ Windows Mobility Center

- ◆ Windows Aero transparent glass design and advance Windows navigation
- ◆ Easy networking and sharing across all your PCs and devices
- ◆ Improved media format support and enhancements to Windows Media Center and media streaming, including Play To
- ◆ Multi-touch (built-in touch screen capabilities)
- ◆ Improved handwriting recognition

WINDOWS 7 PROFESSIONAL

Windows 7 Professional was designed with the small business owner in mind. Microsoft has designed Windows 7 Professional so that you can get more done and safeguard your data. Windows 7 Professional offers some of the following features:

- ◆ Broad application and device compatibility with unlimited concurrent applications
- ◆ A safe, reliable, and supported operating system
- ◆ HomeGroup, which offers the ability to share media, documents, and printers without a domain
- ◆ Improved Taskbar and Jump Lists over Windows Vista
- ◆ Live thumbnail previews and an enhanced visual experience
- ◆ Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- ◆ Windows Mobility Center
- ◆ The ability to resolve many IT issues yourself with Action Center
- ◆ Aero transparent glass design and advanced Windows navigation
- ◆ Easy networking and sharing across all your PCs and devices
- ◆ Improved media format support as well as enhancements to Windows Media Center and media streaming, including Play To
- ◆ Multi-touch
- ◆ Improved handwriting recognition
- ◆ Domain Join for simple and secure server networking
- ◆ An encrypting file system that protects data with advanced network backup
- ◆ Location Aware Printing, for finding the right printer when moving between the office and home
- ◆ Windows XP Mode, for running many Windows XP productivity applications

WINDOWS 7 ENTERPRISE AND ULTIMATE

These are the two editions of Windows 7 designed for mid-sized and large organizations. These two operating systems have the most features and security options of all Windows 7 editions. Some of these features include:

- ◆ Broad application and device compatibility with unlimited concurrent applications
- ◆ A safe, reliable, and supported operating system
- ◆ HomeGroup, which offers the ability to share media, documents, and printers without a domain
- ◆ Improved Taskbar and Jump Lists over Windows Vista
- ◆ Live thumbnail previews and an enhanced visual experience
- ◆ Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- ◆ Windows Mobility Center
- ◆ Aero transparent glass design and advanced Windows navigation
- ◆ Easy networking and sharing across all your PCs and devices
- ◆ Improved media format support and enhancements to Windows Media Center and media streaming, including Play To.
- ◆ Multi-touch
- ◆ Improved handwriting recognition
- ◆ Domain Join, which enables simple and secure server networking
- ◆ An encrypting file system that protects data with advanced network backup
- ◆ Location Aware Printing, which helps find the right printer when moving between the office and home
- ◆ Windows XP Mode, for running many Windows XP productivity applications
- ◆ BitLocker, which protects data on removable devices
- ◆ DirectAccess, which links users to corporate resources from the road without a virtual private network (VPN)
- ◆ BranchCache, which makes it faster to open files and web pages from a branch office
- ◆ AppLocker, for restricting unauthorized software and also enabling greater security

WINDOWS 7 MULTILANGUAGE PACK

Windows 7 Ultimate also includes the multilanguage pack, but Windows 7 Enterprise does not.

Table 2.1 compares all the Windows 7 editions and lists what they include. We compiled this information from Microsoft's website and TechNet. This table is only a partial representation of all the features and applications that are included.

TABLE 2.1: Windows 7 Edition Comparison

	STARTER EDITION	HOME BASIC EDITION	HOME PREMIUM EDITION	PROFESSIONAL EDITION	ENTERPRISE AND ULTIMATE EDITION
Processor (32-bit or 64-bit)	Both	Both	Both	Both	Both
Multiprocessor support	No	No	Yes	Yes	Yes
32-bit maximum RAM	4 GB	4 GB	4 GB	4 GB	4 GB
64-bit Maximum RAM	8 GB	8 GB	16 GB	192 GB	192 GB
Windows HomeGroup	Yes	Yes	Yes	Yes	Yes
Jump Lists	Yes	Yes	Yes	Yes	Yes
Internet Explorer 8	Yes	Yes	Yes	Yes	Yes
Media Player 12	Yes	Yes	Yes	Yes	Yes
System Image	Yes	Yes	Yes	Yes	Yes
Device Stage	Yes	Yes	Yes	Yes	Yes
Sync Center	Yes	Yes	Yes	Yes	Yes
Windows Backup	Yes	Yes	Yes	Yes	Yes
Remote Desktop	Yes	Yes	Yes	Yes	Yes
ReadyDrive	Yes	Yes	Yes	Yes	Yes
ReadyBoost	Yes	Yes	Yes	Yes	Yes
Windows Firewall	Yes	Yes	Yes	Yes	Yes
Windows Defender	Yes	Yes	Yes	Yes	Yes
Taskbar previews	No	Yes	Yes	Yes	Yes

TABLE 2.1: Windows 7 Edition Comparison (*CONTINUED*)

	STARTER EDITION	HOME BASIC EDITION	HOME PREMIUM EDITION	PROFESSIONAL EDITION	ENTERPRISE AND ULTIMATE EDITION
Mobility Center	No	Yes	Yes	Yes	Yes
Easy user switching	No	Yes	Yes	Yes	Yes
Windows Aero Glass	No	No	Yes	Yes	Yes
Multi-touch	No	No	Yes	Yes	Yes
DVD playback	No	No	Yes	Yes	Yes
Windows Media Center	No	No	Yes	Yes	Yes
XP Mode	No	No	No	Yes	Yes
Encrypting file system (EFS)	No	No	No	Yes	Yes
BitLocker	No	No	No	No	Yes
AppLocker	No	No	No	No	Yes
BranchCache	No	No	No	No	Yes
DirectAccess	No	No	No	No	Yes

Now that we have seen what each edition of Windows 7 can accomplish, let's take a look at the hardware requirements needed to install Windows 7.

Hardware Requirements

Before you can insert the Windows 7 DVD and install the operating system, you first must make sure that the machine's hardware can handle the Windows 7 operating system.

To install Windows 7 successfully, your system must meet or exceed certain hardware requirements. Table 2.2 lists the requirements for a Windows 7-compatible PC.

HARDWARE REQUIREMENTS

The hardware requirements listed in Table 2.2 were those specified at the time of this writing. Always check Microsoft's website at www.microsoft.com/windows7 for the most current information.

TABLE 2.2: Hardware Requirements

COMPONENT	REQUIREMENTS
CPU (processor)	1 GHz 32-bit or 64-bit processor
Memory (RAM)	1 GB of system memory
Hard disk	16 GB of available disk space
Video adapter	Support for DirectX 9 graphics with 128 MB of memory (to enable the Aero theme)
Optional drive	DVD-R/W drive
Network device	Compatible network interface card

The Windows 7–compatible PC must meet or exceed the basic requirements to deliver the core functionality of the Windows 7 operating system. These requirements assume that you’re installing only the operating system without any premium functionality. For example, you may be able to get by with the minimum requirements if you’re installing the operating system just to learn the basics of the software. Remember, the better the hardware, the better the performance.

Besides the basic hardware requirements that are needed to install Windows 7, the requirements for the graphic card depend on the resolution at which you want to run. The required amount of memory is as follows:

- ◆ 64 MB is required for a single monitor at a resolution of 1,310,720 pixels or less, which is equivalent to a 1280 × 1024 resolution.
- ◆ 128 MB is required for a single monitor at a resolution of 2,304,000 pixels or less, which is equivalent to a 1920 × 1200 resolution.
- ◆ 256 MB is required for a single monitor at a resolution larger than 2,304,000 pixels.

In addition, the graphics memory bandwidth must be at least 1,600 MB per second, as assessed by the Windows 7 Upgrade Advisor.



Real World Scenario

DECIDING ON MINIMUM HARDWARE REQUIREMENTS

The company you work for has decided that everyone will have their own laptop running Windows 7. You need to determine the new computers’ specifications for processor, memory, and disk space.

The first step is to learn which applications will be used. Typically, most users will work with an email program, a word processor, a spreadsheet, presentation software, and maybe a drawing or graphics program. Additionally, an antivirus application will probably be used. Under these demands, a 1 GHz Celeron processor and 1 GB of RAM will make for a very slow-running

machine. So for this usage, you can assume that the minimum baseline configuration would be higher than a 1 GHz processor with at least 2 GB of RAM.

Based on your choice of baseline configuration, you should then fit a test computer with the applications that will be used on it and test the configuration in a lab environment simulating normal use. This will give you an idea whether the RAM and processor calculations you have made for your environment are going to provide suitable response.

Today's disk drives have become capable of much larger capacity while dropping drastically in price. So for disk space, the rule of thumb is to buy whatever is the current standard. Currently, 500 GB drives are commonplace, which is sufficient for most users. If users plan to store substantial graphics or video files, you may need to consider buying larger-than-standard drives.

Also consider what the business requirements will be over the next 12 to 18 months. If you'll be implementing applications that are memory or processor intensive, you might want to spec out the computers with hardware sufficient to support upcoming needs, to avoid costly upgrades in the near future.

Setting the hardware requirements for Windows 7 on your machine can sometime be a difficult task. You may ask yourself, "Does the hardware you currently have support Windows 7?" Microsoft understands this concern and has a tool called the Hardware Compatibility List to help you figure out if your machines will work with Windows 7.

The Hardware Compatibility List

Along with meeting the minimum requirements, your hardware should appear on the Hardware Compatibility List (HCL). The HCL is an extensive list of computers and peripheral hardware that have been tested with the Windows 7 operating system.

Windows 7 requires control of the hardware for stability, efficiency, and security. The hardware and supported drivers on the HCL have been put through rigorous tests to ensure their compatibility with Windows 7. Microsoft guarantees that the items on the list meet the requirements for Windows 7 and do not have any incompatibilities that could affect the stability of the operating system.

If you call Microsoft for support, the first thing a Microsoft support engineer will ask about is your configuration. If you have any hardware that is not on the HCL, you may not be able to get support from Microsoft.

To determine if your computer and peripherals are on the HCL, check the most up-to-date list at <https://winqual.microsoft.com/HCL/Default.aspx>.

The HCL will let you know if your hardware is compatible with Windows 7. Besides the basic RAM, video, hard drive, and CPU requirements, there are some other areas of the computer that you should examine for compatibility.

BIOS COMPATIBILITY

Before you install Windows 7, verify that your computer has the most current BIOS (Basic Input/Output System). This is especially important if your current BIOS doesn't include support for Advanced Configuration and Power Interface (ACPI) functionality. ACPI functionality is required for Windows 7 to function properly. Check the computer's vendor for the latest BIOS version information.

DRIVER REQUIREMENTS

To successfully install Windows 7, you must have the critical device drivers for your computer, such as the hard drive device driver. The Windows 7 media comes with an extensive list of drivers. If your computer's device drivers are not on the Windows 7 installation media, check the device manufacturer's website. If you can't find the device driver on the manufacturer's website and no other compatible driver exists, you are out of luck. Windows 7 won't recognize devices that don't have Windows 7 drivers.

If your hardware does not have drivers for Windows 7, be sure to check the hardware manufacturers' websites often because new drivers for Windows 7 are released frequently.

After you have made sure that the hardware for your machine is compatible for Windows 7, the next decision to make is how you're going to install the operating system.

New Install or Upgrade?

When installing Windows 7, you have two choices: you can install a fresh copy of Windows 7 or you can upgrade from Windows Vista.

An upgrade allows you to retain your existing operating system's applications, settings, and files. If you currently have a computer with Windows Vista, you are eligible to use an upgrade copy of Windows 7.

However, the bad news is you must always perform a clean install with Windows XP or earlier editions of Windows. You can, however, use the Windows Easy Transfer utility to migrate files and settings from Windows XP to Windows 7 on the same computer. The steps to do this are shown later in the section, "Upgrading from Windows XP to Windows 7."

Another possibility is to upgrade your Windows XP machine to Windows Vista and then upgrade the new Vista operating system to Windows 7.

You can perform an upgrade to Windows 7 if the following conditions are true:

- ◆ You are running Windows Vista.
- ◆ You want to keep your existing applications and preferences.
- ◆ You want to preserve any local users and groups you've created.

You must perform a clean install of Windows 7 if any of the following conditions are true:

- ◆ There is no operating system currently installed.
- ◆ You have an operating system installed that does not support an in-place upgrade to Windows 7 (such as DOS, Windows 9x, Windows NT, Windows Me, Windows 2000 Professional, or Windows XP).
- ◆ You want to start from scratch, without keeping any existing preferences.
- ◆ You want to be able to dual-boot between Windows 7 and your previous operating system.

Table 2.3 shows the Vista operating systems that can be upgraded and to which edition of Windows 7 it should be updated to.

TABLE 2.3: Windows Vista Upgrade Options

WINDOWS VISTA EDITION	WINDOWS 7 EDITION
Home Basic Edition	Home Basic Edition
Home Premium Edition	Home Premium Edition
Business Edition	Professional Edition
Ultimate Edition	Ultimate Edition

Before you decide if you should upgrade or install a clean Windows 7 operating system, let’s take a look at some of the things you need to consider about upgrades.

UPGRADE CONSIDERATIONS

Almost all Windows Vista applications should run with the Windows 7 operating system. However, there are a few possible exceptions to this statement:

- ◆ Applications that use file system filters, such as antivirus software, may not be compatible.
- ◆ Custom power-management tools may not be supported.

Before you upgrade to Windows 7, be sure to stop any antivirus scanners, network services, or other client software. These software packages may see the Windows 7 install as a virus and cause installation issues.

If you’re performing a clean install to the same partition as an existing edition of Windows, the contents of the existing Users (or Documents and Settings), Program Files, and Windows directories will be placed in a directory named `Windows.old`, and the old operating system will no longer be available.

HARDWARE COMPATIBILITY ISSUES

Ensure that you have Windows 7 device drivers for your hardware. If you have a video driver without a Windows 7-compatible driver, the Windows 7 upgrade will install the Standard VGA driver, which will display the video with an 800 × 600 resolution. After you get the Windows 7 driver for your video, you can install it and adjust video properties accordingly.

APPLICATION COMPATIBILITY ISSUES

Not all applications that were written for earlier editions of Windows will work with Windows 7. After the upgrade, if you have application problems, you can address the problems as follows:

- ◆ If the application is compatible with Windows 7, reinstall the application after the upgrade is complete.

- ◆ If the application uses dynamic link libraries (DLLs) and there are migration DLLs for the application, apply the migration DLLs.
- ◆ Use the Microsoft Application Compatibility Toolkit (ACT) to determine the compatibility of your current applications with Windows 7. ACT will determine which applications are installed, identify any applications that may be affected by Windows updates, and identify any potential compatibility problems with User Account Control and Internet Explorer. Reports can be exported for detailed analysis.
- ◆ If applications were written for earlier editions of Windows but are incompatible with Windows 7, use the Windows 7 Program Compatibility Wizard. From Control Panel click the Programs icon and then click the Run Programs From Previous Versions link to start the Program Compatibility Wizard.
- ◆ If the application is not compatible with Windows 7, upgrade your application to a Windows 7–compliant version.

WINDOWS 7 UPGRADE ADVISOR

To assist you in the upgrade process, the Windows 7 Setup program can check the compatibility of your system, devices, and installed applications and then provide the results to you. You can then analyze these results to determine whether your hardware or software applications will port properly from the Windows Vista edition to Windows 7.

You can download the Windows 7 Upgrade Advisor from Microsoft's website at www.microsoft.com/downloads. The Windows 7 Upgrade Advisor is compatible with Windows 7, Windows Vista, and Windows XP with Service Pack 2 or higher.

When you're running the Upgrade Advisor on a machine running Windows XP, if you do not have .NET Framework 2.0, you are asked to download and install it. After the .NET Framework is installed, you can restart the Upgrade Advisor installation.

After your computer is scanned, the Upgrade Advisor determines whether any incompatibilities exist between your computer and Windows 7. It also tells you which edition of Windows 7 seems to be best for your computer. However, you are by no means limited to upgrading to the recommended edition. The Upgrade Advisor Compatibility reports are broken up into the following three categories:

System Requirements The System Requirements report alerts you to any shortcomings your system might have when running certain editions of Windows Vista. For example, our lab computer should have no problems accessing all the features of Windows Vista Business, but it won't be able to access all of the features of Windows Vista Home Premium or Windows Vista Ultimate because it doesn't have a TV tuner card.

Devices The Drivers report alerts you to any potential Windows Vista driver issues. Each device in your system will be listed in this section either as a device to be reviewed or as a device that should automatically work after Windows 7 is installed. We will need a driver for the network card after Windows 7 is installed.

Programs The Programs report alerts you to any potential application compatibility issues.

You can also save or print a task list that tells you the most compatible Windows 7 edition, your current system configuration, and the steps you need to take before and after you install Windows 7.

Perform the following steps to download and run the Windows 7 Upgrade Advisor:

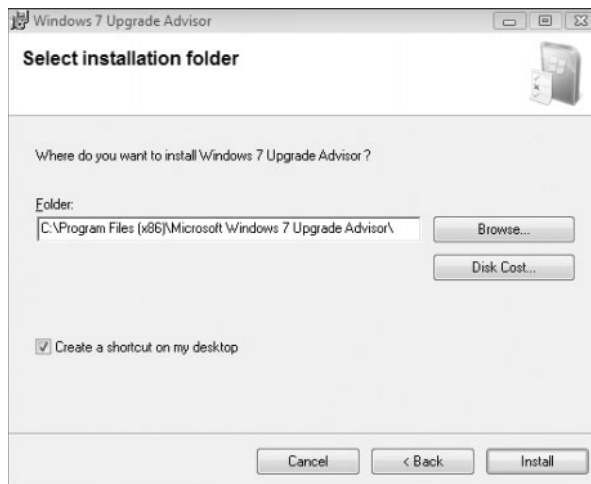
1. Go to www.microsoft.com/downloads and download the Windows 7 Upgrade Advisor.
2. After the download is complete, run the .msi installation.
3. The Windows 7 Upgrade Advisor Setup Wizard starts, as shown in Figure 2.1. Click the Next button.

FIGURE 2.1
Upgrade Advisor
Setup Wizard



4. At the License screen, click the I Accept The License Terms check box and click Next.
5. At the Select Installation Folder screen, accept the defaults or choose a directory location where you want this program installed, as shown in Figure 2.2. Click Install.

FIGURE 2.2
The Select Installation
Folder screen



6. At the Installation Complete screen, click the Close button.
7. On the desktop, double-click the Windows 7 Upgrade Advisor icon.
8. When the Windows 7 Upgrade Advisor starts, click the Start Check button to start the scan of the machine.
9. After the system scan is complete, the Upgrade Advisor gives you the results. You can print or save these results. Close the Upgrade Advisor.

AN UPGRADE CHECKLIST

After you make the decision to upgrade, you should develop a plan of attack. The following upgrade checklist (valid for upgrading from Windows Vista) will help you plan and implement a successful upgrade strategy:

- ◆ Verify that your computer meets the minimum hardware requirements for Windows 7.
- ◆ Be sure that your hardware is on the HCL.
- ◆ Make sure you have the Windows 7 drivers for the hardware. You can verify this with the hardware manufacturer.
- ◆ Run the Windows 7 Upgrade Advisor tool from the Microsoft website, which also includes documentation on using the utility, to audit the current configuration and status of your computer. It will generate a report of any known hardware or software compatibility issues based on your configuration. You should resolve any reported issues before you upgrade to Windows 7.
- ◆ Make sure that your BIOS is current. Windows 7 requires that your computer has the most current BIOS. If it does not, the computer may not be able to use advanced power-management features or device-configuration features. In addition, your computer may cease to function during or after the upgrade. Use caution when performing BIOS updates, as installing the incorrect BIOS can cause your computer to fail to boot.
- ◆ Take an inventory of your current configuration. This inventory should include documentation of your current network configuration, the applications that are installed, the hardware items and their configuration, the services that are running, and any profile and policy settings.
- ◆ Back up your data and configuration files. Before you make any major changes to your computer's configuration, you should back up your data and configuration files and then verify that you can successfully restore your backup. Chances are if you have a valid backup, you won't have any problems.
- ◆ Delete any unnecessary files or applications, and clean up any program groups or program items you don't use. Theoretically, you want to delete all the junk on your computer before you upgrade. Think of this as the spring-cleaning step.
- ◆ Verify that there are no existing problems with your drive prior to the upgrade. Perform a disk scan, a current virus scan, and defragmentation. These, too, are spring-cleaning chores. This step just prepares your drive for the upgrade.

- ◆ Perform the upgrade. In this step, you upgrade from the Windows Vista operating system to Windows 7.
- ◆ Verify your configuration. After Windows 7 has been installed, use the inventory to compare and test each element that was previously inventoried prior to the upgrade to verify that the upgrade was successful.

HANDLING AN UPGRADE FAILURE

Before you upgrade, you should have a contingency plan in place. Your plan should assume the worst-case scenario. For example, what happens if you upgrade and the computer doesn't work anymore? It is possible that, after checking your upgrade list and verifying that everything should work, your attempt at the actual upgrade might not work. If this happens, you might want to return your computer to the original, working configuration.

Indeed, we have made these plans, created our backups (two, just in case), verified our backups, and then had a failed upgrade anyway — only to discover that we had no clue where to find our original operating system CD. A day later, with the missing CD located, we were able to get up and running again. Our problem was an older BIOS, and the manufacturer of our computer did not have an updated BIOS.

When you install Windows 7, you must decide how you want to partition the disk drive that the Windows 7 operating system will reside on.

Disk Space Partitioning

Disk partitioning is the act of taking the physical hard drive and creating logical partitions. A logical drive is how space is allocated to the drive's primary and logical partitions. For example, if you have a 500 GB hard drive, you might partition it into three logical drives: a C drive, which might be 200 GB; a D drive, which might be 150 GB; and an E drive, which might be 150 GB.

Some of the major considerations for disk partitioning are as follows:

- ◆ The amount of space required
- ◆ The location of the system and boot partition
- ◆ Any special disk configurations you will use
- ◆ The utility you will use to set up the partitions

Partition Size One important consideration in your disk-partitioning scheme is determining the partition size. You need to consider the amount of space taken up by your operating system, the applications that will be installed, and the amount of stored data. It is also important to consider the amount of space required in the future.

Microsoft recommends that you allocate at least 16 GB of disk space for Windows 7. This allows room for the operating system files and for future growth in terms of upgrades and installation files that are placed with the operating system files.

System and Boot Partitions When you install Windows 7, files will be stored in two locations: the system partition and the boot partition. The system partition and the boot partition can be the same partition.

The system partition contains the files needed to boot the Windows 7 operating system. The system partition contains the Master Boot Record (MBR) and boot sector of the active drive partition. It is often the first physical hard drive in the computer and normally contains the necessary files to boot the computer. The files stored on the system partition do not take any significant disk space. The active partition is the system partition that is used to start your computer. The C drive is usually the active partition.

The boot partition contains the Windows 7 operating system files. By default, the Windows operating system files are located in a folder named `Windows`.

Special Disk Configurations Windows 7 supports several disk configurations. Options include simple, spanned, and striped volumes. These configuration options are covered in detail in Chapter 4, “Configuring Disks.”

Disk Partition Configuration Utilities If you are partitioning your disk prior to installation, you can use several utilities, such as the DOS or Windows Fdisk program or a third-party utility such as Norton’s Partition Magic. You can also configure the disks during the installation of the Windows 7 operating system.

You might want to create only the first partition where Windows 7 will be installed. You can then use the Disk Management utility in Windows 7 to create any other partitions you need. The Windows 7 Disk Management utility is covered in Chapter 4.

Another configuration option that you must set when you install Windows 7 is the location of where the computer will reside after the install is complete.

Language and Locale

Language and locale settings determine the language the computer will use. Windows 7 supports many languages for the operating system interface and utilities.

Locale settings configure the locality for items such as numbers, currencies, times, and dates. An example of a locality is that English for United States specifies a short date as `mm/dd/yyyy`, while English for South Africa specifies a short date as `yyyy/mm/dd`.

After you have planned your installation and you know how you want to install Windows 7, it’s time to install the operating system.

Installing Windows 7

You can install Windows 7 either from the bootable DVD or through a network installation using files that have been copied to a network share point. You can also launch the `setup.exe` file from within the Windows Vista operating system to upgrade your operating system.

The Windows 7 DVD is bootable. To start the installation, simply restart your computer and boot to the DVD. The installation process begins automatically. I will walk you through the steps of installing Windows 7 later in this chapter.

If you are installing Windows 7 from the network, you need a distribution server and a computer with a network connection. A distribution server is a server that has the Windows 7 distribution files copied to a shared folder.

Perform the following steps to install Windows 7 over the network:

1. Boot the target computer.
2. Attach to the distribution server and access the share that has the files copied to it.
3. Launch `setup.exe`.
4. Complete the Windows 7 installation using either the clean install method or the upgrade method.

These methods are discussed in detail in the following sections.

Performing a Clean Install of Windows 7

On any installation of Windows 7, there are three stages to the installation. First you have the Collecting Information section, then the Installing Windows section, and finally the Setting Up Windows section.

Collecting Information During the collection phase of the installation, Windows 7 gathers the information necessary to complete the installation. This is where Windows 7 gathers your local time, location, keyboard, license agreement, installation type, and installation disk partition.

Installing Windows This section of the installation is where your Windows 7 files are copied to the hard disk and the installation is completed. This phase takes the longest as the files are installed.

Setting Up Windows This phase of the setup is where you set up a username, computer name, password, product key, and security settings, and review your date and time. After this is finished, your installation will be complete.

You can run the installation from the optical media or over a network. The only difference in the installation procedure is your starting point: from your optical drive or from a network share. The steps in the following sections assume you are using the Windows 7 DVD to install Windows 7.

SETTING UP YOUR COMPUTER FOR HANDS-ON EXERCISES

Before you begin any of the procedures, verify that your computer meets the requirements for installing Windows 7 as listed in Table 2.2.

The exercises in this book assume that your computer is configured in a specific manner. Your computer should have at least a 16 GB drive that is configured with at least the minimum space requirements and partitions.

When you boot to the Windows 7 installation media, the Setup program automatically starts the Windows 7 installation.

INSTALLING WINDOWS 7

Before you begin any of the procedures, verify that you have access to Windows 7 Ultimate; other editions might vary slightly. You can also download an evaluation edition of Windows 7 from Microsoft's website at www.microsoft.com/windows7.

Perform the following steps to perform a clean install of Windows 7:

1. Insert the Windows 7 DVD into the machine and start the computer.
2. If you are asked to Hit Any Key to start the DVD, press Enter.
3. The first screen asks you to enter your language, local time, and keyboard. After filling in these fields, click Next, as shown in Figure 2.3.

FIGURE 2.3
Windows 7 Installation screen

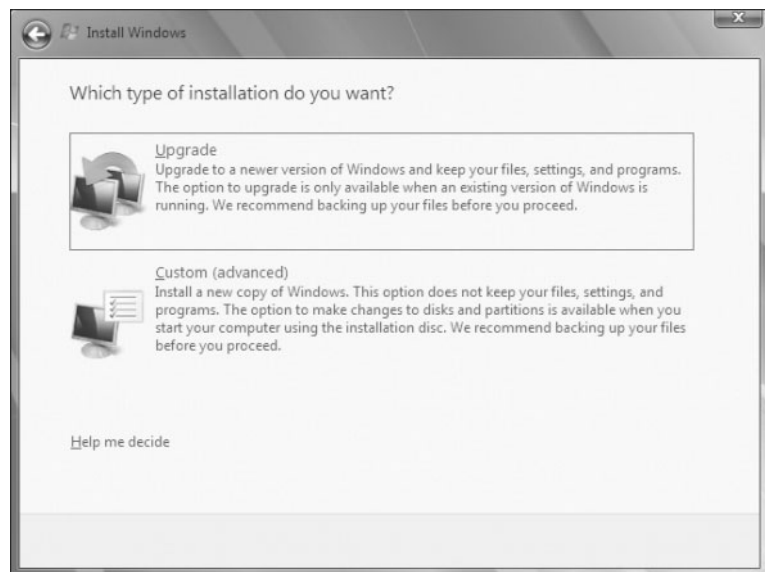


4. At the next screen, click the Install Now button, as shown in Figure 2.4.
5. A message shows you that Setup is starting. The licensing screen will be first. Read the license agreement and then check the "I accept the license term" check box. Click Next.
6. screen asking you "Which type of installation do you want?" is next, as shown in Figure 2.5. Click Custom (Advanced).
7. The next screen asks you where you want to install Windows 7, as shown in Figure 2.6. Choose an unformatted free space or a partition (the partition will be erased) with at least 20 GB available. You can also click the Drive Options (Advanced) link to create your own partition. After you choose your partition, click Next.
8. After your partition is set, the installation starts. You see the progress of the installation during the entire process. After the installation is complete, the machine reboots.
9. After the installation is complete, the username and computer name screen appears, as shown in Figure 2.7. Type in your username and computer name and click Next.
10. Next set your password and password hint, as shown in Figure 2.8. Enter your password twice and enter your hint. Click Next.

FIGURE 2.4
Windows 7 Install
Now screen



FIGURE 2.5
Choosing the Windows
7 installation type



11. The next screen asks you to enter your 25-digit product key. Enter your product key and make sure the check box to automatically register your machine when you're online is selected. Click Next.
12. Settings related to Windows Update and security appear, as shown in Figure 2.9. You can select Use Recommended Settings, Install Important Updates For Windows Only, or have the computer ask you later. If you select the option to use the recommended settings, the following settings are configured:

- ◆ Windows Update will be enabled and updates will automatically install.
- ◆ Windows Defender will be installed and any collected information will be sent to Microsoft.
- ◆ Errors will automatically be sent to Microsoft.

FIGURE 2.6
Specify a location for installing Windows 7.

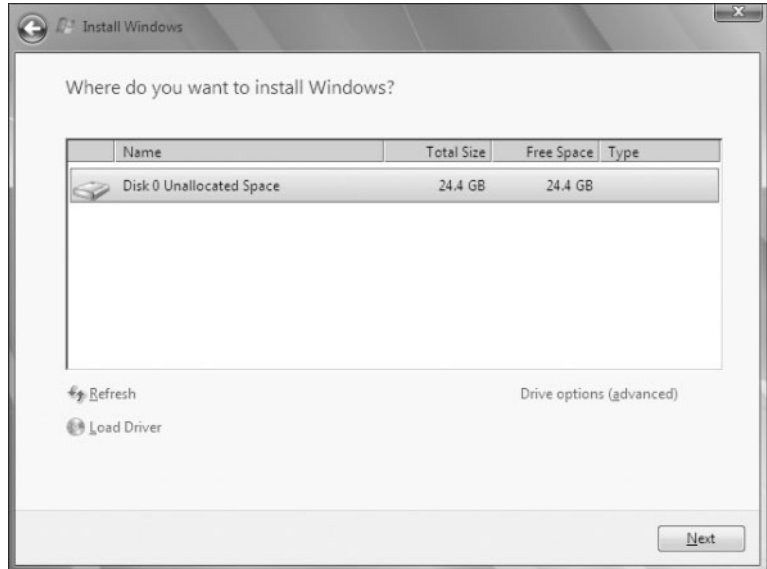


FIGURE 2.7
Adding a username and computer name



FIGURE 2.8
Password screen

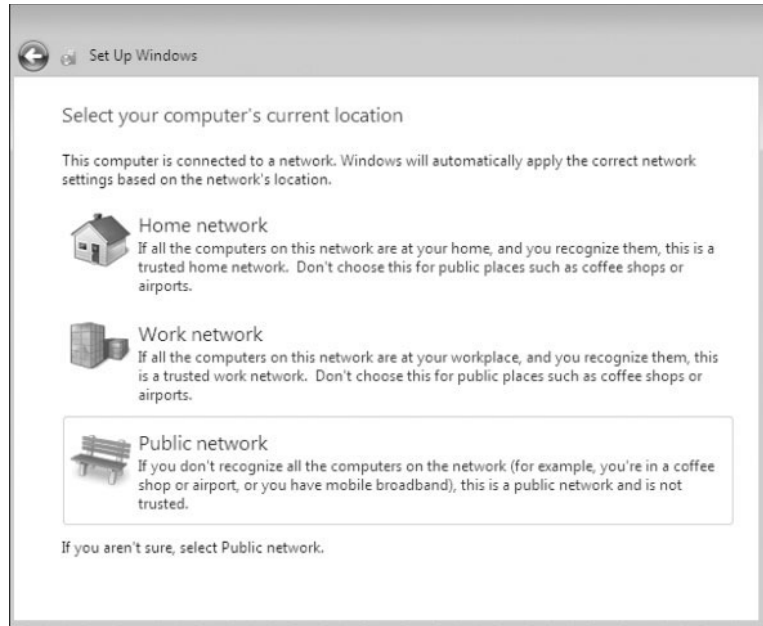


FIGURE 2.9
Specify settings related
to Windows Update
and security.



- ◆ The latest drivers for your hardware will automatically be downloaded from Windows Update.
- 13. You are now able to verify your time and date settings. Configure your time, time zone, and date. Click Next.
- 14. You then set your computer's current location. You have the ability to choose from a home, work, or public location. Choose where your computer is located, as shown in Figure 2.10.

FIGURE 2.10
Choosing a
network location



- 15. Windows will finalize your setup and the installation will be complete.

As you can see, installing Windows 7 is an easy process on a new computer system. But what if the system already has Windows Vista? Let's take a look at how to perform an installation of Windows 7 onto a machine with Windows Vista.

Performing an Upgrade to Windows 7

If your machine has Windows Vista already installed, you have the ability to upgrade the machine to Windows 7.

Similar to a clean install, you can run the installation from the installation DVD or over a network. The only difference in the installation procedure is your starting point: from your optical drive or from a network share. The following steps assume that you are using the Windows 7 DVD to install the Windows 7 operating system.

The three main steps in the Windows 7 upgrade process are similar to the process of a clean install. The three steps of upgrading to Windows 7 are

1. Collecting information
2. Installing Windows
3. Setting up Windows

Perform these steps to go through the process of installing Windows 7 by upgrading Windows Vista:

1. Insert the Windows 7 DVD.
2. If Autorun does not start, go to the DVD drive and click `setup.exe`. After the setup starts (by either method), click Install Windows 7.
3. You are prompted to update your current operating system. If you choose not to update, the installation might fail. You can also choose to send information to Microsoft during this process.
4. The Microsoft Windows 7 license terms will appear. The installation does not allow you to click Next until you have accepted the license terms.
5. You are prompted to select the type of installation you want to perform. Choose the Upgrade link.
6. You will see a compatibility report that alerts you of any applications or drivers that are not supported in Windows 7. Click Next.

The following step occurs in the Installing Windows section of the upgrade:

- ◆ During the Installing Windows Upgrade phase, all the files required by the Setup program are copied to the hard drive. During the process, the computer automatically reboots. This process takes several minutes and proceeds automatically without user intervention. The following steps appear on the screen along with a completion percentage for each:
 1. Copying Windows files
 2. Gathering files, settings, and programs
 3. Expanding Windows files
 4. Installing features and updates
 5. Transferring files, settings, and programs

After your computer finishes copying files and reboots, you will be in the Setting Up Windows phase of the installation. Perform the following steps to complete the upgrade:

1. The first screen asks for your Windows product key. Type your 25-digit product key and click Next.
2. Settings related to Windows Update and security appear next. You can use the recommended settings, install important updates only, or have the computer ask you later.
3. On the next screen, you review your time and date settings. Set up your local time and date and choose if you want daylight savings time. Click Next.
4. The installation completes.

When you install Windows 7, you might run into setup problems or errors. Let's take a look at the troubleshooting process involved with Windows 7 installations.

Troubleshooting Installation Problems

The Windows 7 installation process is designed to be as simple as possible. The chances for installation errors are greatly minimized through the use of wizards and the step-by-step process. However, errors may occur.

IDENTIFYING COMMON INSTALLATION PROBLEMS

As most of you are aware, installations seldom go off without a hitch. Some of the possible installation errors that you might encounter are as follows:

Media Errors Media errors are caused by defective or damaged DVDs. To check the disc, put it into another computer and see if you can read it. Also check your disc for scratches or dirt — it might just need to be cleaned.

Insufficient Disk Space Windows 7 needs at least 16 GB of free space for the installation program to run properly. If the Setup program cannot verify that this space exists, the program will not let you continue.

Not Enough Memory Make sure that your computer has the minimum amount of memory required by Windows 7 (1 GB). Having insufficient memory might cause the installation to fail or blue-screen errors to occur after installation.

Not Enough Processing Power Make sure that your computer has the minimum processing power required by Windows 7 (1 GHz). Having insufficient processing power might cause the installation to fail or blue-screen errors to occur after installation.

Hardware That Is Not on the HCL If your hardware is not listed on the HCL, Windows 7 might not recognize the hardware or the device might not work properly.

Hardware with No Driver Support Windows 7 will not recognize hardware without driver support.

Hardware That Is Not Configured Properly If your hardware is Plug and Play-compatible, Windows 7 should configure it automatically. If your hardware is not Plug and Play-compatible, you need to manually configure the hardware per the manufacturer's instructions.

Incorrect Product Key Without a valid product key, the installation will not go past the Product Key screen. Make sure that you have not typed an incorrect key (check your Windows 7 installation folder or your computer case for this key).

Failure to Access TCP/IP Network Resources If you install Windows 7 with typical settings, the computer is configured as a DHCP client. If there is no DHCP server to provide IP configuration information, the client will still generate an autoconfigured IP address but will be unable to access network resources through TCP/IP if the other network clients are using DHCP addresses.

Installing Unsupported Hard Drives If your computer is using a hard disk that does not have a driver included on the Windows 7 media, you will receive an error message stating that the hard drive cannot be found. You should verify that the hard drive is properly connected

and functional. You will need to obtain a disk driver for Windows 7 from the manufacturer and then specify the driver location by selecting the Load Driver option during partition selection.

TROUBLESHOOTING WITH INSTALLATION LOG FILES

When you install Windows 7, the Setup program creates several log files. You can view these logs files to check for any problems during the installation process. The following two log files are particularly useful for troubleshooting:

- ◆ The action log includes all of the actions that were performed during the setup process and a description of each action. These actions are listed in chronological order. The action log is stored as `\Windows\setupact.log`.
- ◆ The error log includes any errors that occurred during the installation. For each error, there is a description and an indication of the severity of the error. This error log is stored as `\Windows\setuperr.log`.

In the following steps you will view the Windows 7 setup logs to determine whether there were any problems with your Windows 7 installation.

Follow these steps to troubleshoot failed installations with setup logs:

1. Select Start > Computer.
2. Double-click Local Disk (C:).
3. Double-click Windows.
4. In the Windows folder, double-click the `setupact.log` file to view your action log in Notepad. When you finish viewing this file, close Notepad.
5. Double-click the `setuperr.log` file to view your error file in Notepad. If no errors occurred during installation, this file will be empty. When you finish viewing this file, close Notepad.
6. Close the directory window.

After you install Windows 7 and look at the setup logs, it might be necessary to transfer user's data from one system to another or migrate data from the same computer. Let's take a look at the migration process.

Migrating Files and Settings

Rather than perform an in-place upgrade, you can choose to migrate your files and settings from an existing installation. In this case, you can use the User State Migration Tool (USMT) or the Windows Easy Transfer.

USER STATE MIGRATION TOOL

You can download a utility called the User State Migration Tool (USMT) that administrators use to migrate large numbers of users over automated deployments. The USMT for Windows 7 is now part of Windows Automated Installation Kit (Windows AIK). The USMT is similar to Windows Easy Transfer with the following differences:

- ◆ The USMT is more configurable and can use XML files to specify which files and settings are transferred.

- ◆ The USMT is scriptable and uses command-line utilities to save and restore user files and settings.

The USMT consists of two executable files: `ScanState.exe` and `LoadState.exe`. In addition, there are three premade migration rule information files: `Migapp.xml`, `Migsys.xml`, and `Miguser.xml`. Finally, you can create a `Config.xml` file that specifies what should and should not be migrated. The purposes of these files are as follows:

- ◆ `ScanState.exe` collects user data and settings information based on the configuration of the `Migapp.xml`, `Migsys.xml`, and `Miguser.xml` files and stores it as an image file.
- ◆ `LoadState.exe` then deposits the information that is collected to a computer running a fresh copy of Windows 7.

The information that is migrated includes the following:

- ◆ From each user:
 - ◆ Documents
 - ◆ Video
 - ◆ Music
 - ◆ Pictures
 - ◆ Desktop files
 - ◆ Start Menu
 - ◆ Quick Launch toolbar
 - ◆ Internet Explorer Favorites
- ◆ From the All Users profile:
 - ◆ Shared Documents
 - ◆ Shared Video
 - ◆ Shared Music
 - ◆ Shared Desktop files
 - ◆ Shared Pictures
 - ◆ Shared Start Menu
 - ◆ Shared Internet Explorer Favorites
 - ◆ Files with certain file types, including `.doc`, `.dot`, `.rtf`, `.txt`, `.wps`, `.wri`, `.xls`, `.csv`, `.wks`, `.ppt`, `.pps`, `.pot`, `.pst`, and more
 - ◆ Access control lists (ACLs)

The USMT will not migrate hardware settings, drivers, passwords, application binaries, synchronization files, `.dll` files, or other executables.

USING THE USMT

The USMT is downloadable software from Microsoft's website. In its simplest form, you use the USMT in the following manner:

1. Run `ScanState.exe` on the source computer. `ScanState.exe` will copy the user state data to an intermediate store. The intermediate store (for example, a CD-RW) must be large enough to accommodate the data that will be transferred. `Scanstate.exe` would commonly be executed as a shortcut sent to users that they would deploy in the evening or through a scheduled script.
2. Install a fresh copy of Windows 7 on the target computer.
3. Run `LoadState.exe` on the target computer. `LoadState.exe` will access the intermediate store to restore the user settings.

When you use the USMT, you can create a script that can be run manually or can be used as an automated process at a scheduled time. Table 2.4 defines the options for the `Scanstate.exe` and `Loadstate.exe` commands.

TABLE 2.4: Options for `Scanstate.exe` and `Loadstate.exe`

OPTION	DESCRIPTION
<code>/config</code>	Specifies the <code>Config.xml</code> file that should be used
<code>/encrypt</code>	Encrypts the store (<code>Scanstate.exe</code> only)
<code>/decrypt</code>	Decrypts the store (<code>Loadstate.exe</code> only)
<code>/nocompress</code>	Disables data compression
<code>/genconfig</code>	Generates a <code>Config.xml</code> file but does not create a store
<code>/targetxp</code>	Optimizes <code>ScanState</code> for use with Windows XP
<code>/all</code>	Migrates all users
<code>/ue</code>	User exclude: excludes the specified user
<code>/ui</code>	User include: includes the specified user
<code>/uel</code>	Excludes user based on last login time
<code>/v verboselevel</code>	Used to identify what verbosity level will be associated with the log file on a scale of 0–13, with 0 the least verbose

WINDOWS EASY TRANSFER

Windows 7 ships with a utility called Windows Easy Transfer that is used to transfer files and settings from one computer to another. You can transfer some or all of the following

files and settings from a computer running Windows XP with Service Pack 2 or Windows Vista:

- ◆ User accounts
- ◆ Folders and files
- ◆ Program settings
- ◆ Internet settings
- ◆ Favorites
- ◆ E-mail messages, contacts, and settings

You can transfer the migrated files and settings using the following methods:

- ◆ Easy Transfer Cable, which is a USB cable that connects to the source and destination computers
- ◆ CD or DVD
- ◆ Removable media, such as a USB flash drive or a removable hard drive
- ◆ Network share
- ◆ Direct network connection

You can password-protect the migrated files and settings if you use CDs, DVDs, removable media, or a network share. Now let's take a look at how to upgrade a Windows XP machine to Windows 7.

Upgrading from Windows XP to Windows 7

Because the upgrade option from Windows XP to Windows 7 is not available, you can use Windows Easy Transfer to integrate settings from Windows XP to Windows 7 on the same computer.

The first step in this migration process is to copy your files to a removable media such as an external hard drive or thumb drive or to a network share. After the installation of the Windows 7 operating system, you can then migrate these files onto the Windows 7 system.

Perform the following steps to migrate from Windows XP to Windows 7:

1. Insert the Windows 7 DVD while running Windows XP. If the Windows 7 installation window opens automatically, close it.
2. Open Windows Explorer by right-clicking the Start menu and then clicking Explore.
3. Browse to the DVD drive on your computer and click `migsetup.exe` in the `Support\Migwiz` directory.
4. When the Windows Easy Transfer window opens, click Next.
5. Select an external hard disk or USB flash drive.
6. Click This Is My Old Computer. Windows Easy Transfer scans the computer.
7. Click Next. You can also determine which files should be migrated by selecting only the user profiles you want to transfer or by clicking Customize.

8. Enter a password to protect your Easy Transfer file, or leave the box blank, and then click Save.
9. Browse to the external location on the network or to the removable media where you want to save your Easy Transfer file and then click Save.
10. Click Next. Windows Easy Transfer displays the filename and location of the Easy Transfer file you just created.

Perform the following steps to use the Windows 7 DVD to install the operating system:

1. Start Windows 7 Setup by browsing to the root folder of the DVD in Windows Explorer, and then double-clicking `setup.exe`.
2. Click Go Online To Get The Latest Updates (Recommended) to retrieve any important updates for Windows 7. This step is optional. If you choose not to check for updates during Setup, click Do Not Get The Latest Updates.
3. Read and accept the Microsoft Software License Terms. Click "I accept the License Terms (required to use Windows)," and then click Next. If you click "I decline (cancel installation)," Windows 7 Setup will exit.
4. Click Custom to perform an upgrade to your existing Windows installation.
5. Select the partition where you would like to install Windows. To move your existing Windows installation into a `Windows.old` folder and replace the operating system with Windows 7, select the partition where your current Windows installation is located.
6. Click Next and then click OK.
7. Windows 7 Setup will proceed without further interaction.

Now, perform the following steps to migrate files to the destination computer:

1. If you saved your files and settings in an Easy Transfer file on a removable media such as a universal flash device (UFD) rather than on a network share, insert the removable media into the computer.
2. Select Start > All Programs > Accessories > System Tools > Windows Easy Transfer.
3. When the Windows Easy Transfer window opens, click Next.
4. Click An external hard disk or USB flash drive.
5. Click This Is My New Computer.
6. Click Yes, Open The File.
7. Browse to the location where the Easy Transfer file was saved. Click the filename, and then click Open.
8. Click Transfer to transfer all files and settings. You can also determine which files should be migrated by selecting only the user profiles you want to transfer, or by clicking Customize.
9. Click Close after Windows Easy Transfer has completed moving your files.

Once the migration process is complete, you should regain the disk space used by the Windows XP system by using the Disk Cleanup tool to delete the `Windows.old` directory.

Perform the following steps to use the Disk Cleanup tool:

1. Open Disk Cleanup. Select Start > All Programs > Accessories > System Tools > Disk Cleanup.
2. Click Clean Up System Files.
3. Previous installations of Windows are scanned. After they are scanned, select Previous Windows Installation(s) and any other categories of files you want to delete.
4. Click OK and then click Delete Files.

UPGRADING TO WINDOWS VISTA

Another important decision that you should consider is whether to upgrade your Windows XP clients to Windows Vista first and then upgrade the machine to Windows 7.

As you have seen, you can migrate your users' data, but let's say you have software installed and you can't locate the CD/DVD for that software package. It might be beneficial to a user or organization to upgrade the Windows XP machine to Windows Vista. After that installation is complete, upgrade the Vista machine to Windows 7.

This is just another option that is available to you when you migrate your users to the Windows 7 operating system.

Another option you may choose is to run two different operating systems on the same computer system. This gives you the choice of which operating system you want to boot into when the system starts. Installing multiple operating systems onto the same computer is called dual-booting or multibooting.

Supporting Multiboot Options

You might want to install Windows 7 but still be able to run other operating systems. Dual-booting or multibooting allows your computer to boot multiple operating systems. Your computer will be automatically configured for dual-booting if there was a supported operating system on your computer prior to the Windows 7 installation, you didn't upgrade from that operating system, and you installed Windows 7 into a different partition.

One reason for dual-booting is to test various systems. If you have a limited number of computers in your test lab and you want to be able to test multiple configurations, you should dual-boot. For example, you might configure one computer to multi-boot with Windows XP Professional, Windows Vista, and Windows 7.

Here are some keys to successful dual-boot configurations:

- ◆ Make sure you have plenty of disk space.
- ◆ Windows 7 must be installed on a separate partition in order to dual-boot with other operating systems.
- ◆ Install older operating systems before installing newer operating systems.
- ◆ If you want to support dual-booting with Windows XP and Windows 7, Windows XP must be installed first. If you install Windows 7 first, you cannot install Windows XP without

ruining your Windows 7 configuration. This requirement also applies to Windows 9x, Windows 2000, and Windows Vista.

- ◆ Never, ever upgrade to Windows 7 dynamic disks. Dynamic disks are seen only by Windows 2000, Windows XP Professional, Windows Server 2003, Windows Vista, and Windows 7, and are not recognized by any other operating system, including Windows NT and Windows XP Home Edition.
- ◆ Only Windows NT 4.0 (with Service Pack 4), Windows 2000, Windows XP, Windows Vista, Windows 7, Windows Server 2003, and Windows Server 2008 can recognize NTFS file systems. Other Windows operating systems use FAT16 or FAT32 and cannot recognize NTFS. All Windows-based operating systems can recognize FAT partitions.
- ◆ If you will dual-boot with Windows 9x, you must turn off disk compression or Windows 7 will not be able to read the drive properly.
- ◆ Do not install Windows 7 on a compressed volume unless the volume was compressed using NTFS compression.
- ◆ Files that are encrypted with Windows 7 will not be available to Windows NT 4.

WINDOWS NT 4.0 AND WINDOWS 7 DUAL-BOOTING

If you are planning on dual-booting with Windows NT 4, you should upgrade it to NT 4 Service Pack 4 (or higher), which provides NTFS version 5 support.

After you install each operating system, you can choose the operating system that you will boot to during the boot process. You will see a boot selection screen that asks you to choose which operating system you want to boot.

The Boot Configuration Data (BCD) store contains boot information parameters that were previously found in `boot.ini` in older versions of Windows. To edit the boot options in the BCD store, use the `bcdedit` utility, which can be launched only from a command prompt.

Perform the following steps to open a command prompt window:

1. Launch `\Windows\system32\cmd.exe`.
2. Open the Run command by pressing [Windows] key+R.
3. Type `cmd.exe` in the Search Programs And Files box and press Enter.

After the command prompt window is open, type `bcdedit` to launch the `bcdedit` utility. You can also type `bcdedit /?` to see all the various `bcdedit` commands.

After the Windows 7 installation is complete, it's time to do some general housekeeping. The first thing we need to do is activate the Windows 7 operating system.

Using Windows Activation

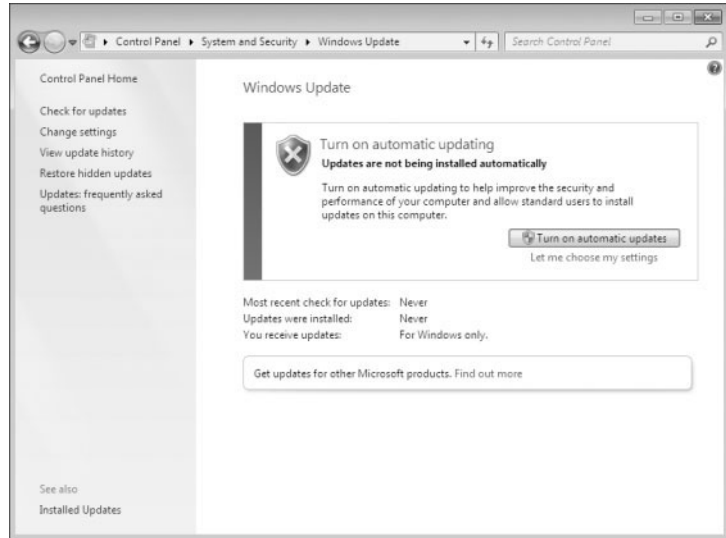
Windows Activation is Microsoft's way of reducing software piracy. Unless you have a corporate license for Windows 7, you will need to perform postinstallation activation. You can do this online or call Microsoft on the telephone. Windows 7 will attempt automatic activation three days after you log on to Windows 7 for the first time. There is a grace period

when you will be able to use the operating system without activation. After the grace period expires, you will not be able to create new files or save changes to existing files until Windows 7 is activated. When the grace period runs out, the Windows Activation Wizard automatically starts; it walks you through the activation process.

Using Windows Update

Windows Update, as shown in Figure 2.11, is a utility that connects to Microsoft's website and checks to ensure that you have the most up-to-date version of Microsoft products.

FIGURE 2.11
Windows Update



Some of the common update categories associated with Windows Update are as follows:

- ◆ Critical updates
- ◆ Service packs
- ◆ Drivers

Perform the following steps to configure Windows Update:

1. Select Start > Control Panel.
 - ◆ From Windows Icons View, select Windows Update.
 - ◆ From Windows Category View, select System And Security, Windows Update.
2. Configure the options you want to use for Windows Update, and click OK.

You can access the following options from Windows Update:

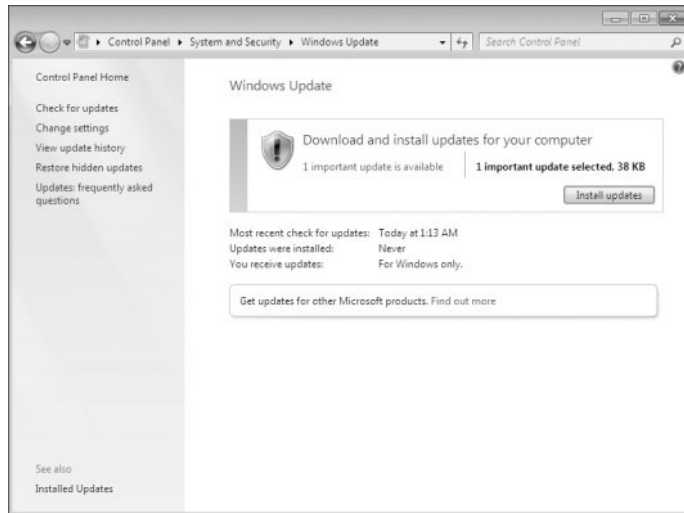
- ◆ Check For Updates
- ◆ Change Settings
- ◆ View Update History

- ◆ Restore Hidden Updates
- ◆ Updates: Frequently Asked Questions
- ◆ Installed Updates

CHECK FOR UPDATES

When you click Check For Updates, Windows Update retrieves a list of available updates from the Internet. You can then click View Available Updates to see what updates are available. Updates are marked as Important, Recommended, or Optional. Figure 2.12 shows a sample list of updates.

FIGURE 2.12
Checking for updates



CHANGE SETTINGS

Clicking Change Settings allows you to customize how Windows can install updates.

You can configure the following options:

- ◆ Install Updates Automatically (Recommended)
- ◆ Download Updates But Let Me Choose To Install Them
- ◆ Download Updates But Let Me Choose Whether To Download And Install Them
- ◆ Never Check For Updates (Not Recommended)

Figure 2.13 shows the settings that you can configure for Windows Update.

VIEW UPDATE HISTORY

View Update History, as shown in Figure 2.14, is used to view a list of all of the installations that have been performed on the computer. You can see the following information for each installation:

- ◆ Update Name
- ◆ Status (Successful, Unsuccessful, Or Canceled)

- ◆ Importance (Important, Recommended, Or Optional)
- ◆ Date Installed

RESTORE HIDDEN UPDATES

With Restore Hidden Updates you can list any updates that you have hidden from the list of available updates. An administrator might hide updates that they do not want users to install.

FIGURE 2.13
Changing settings in
Windows Update

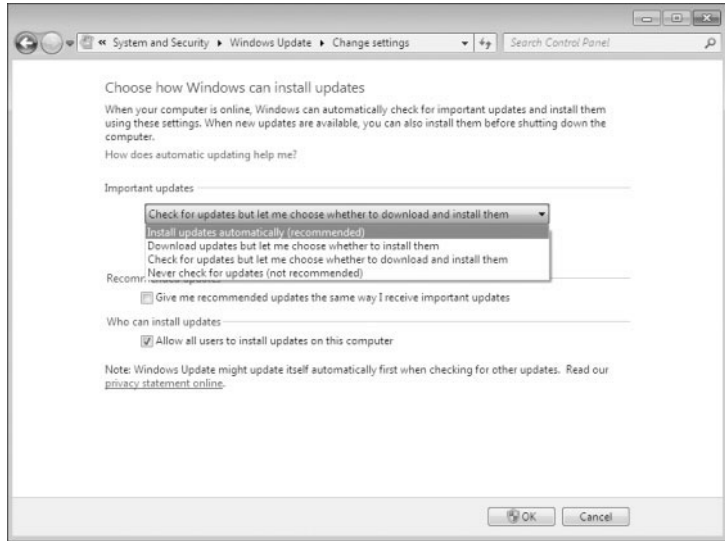
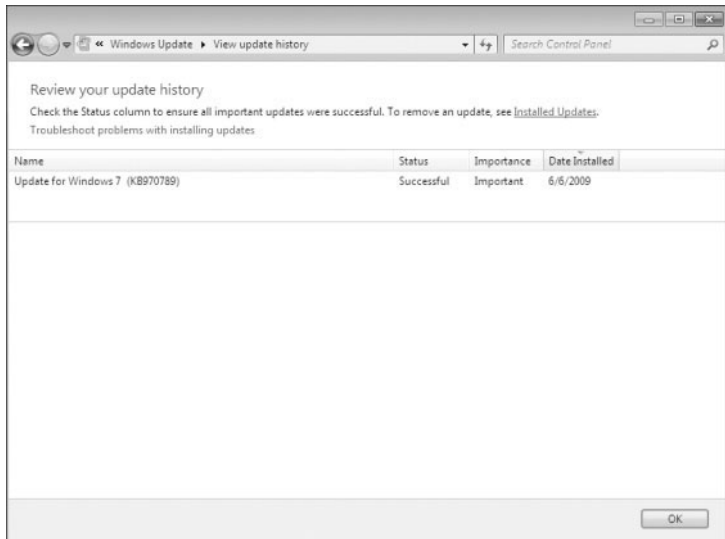


FIGURE 2.14
Windows Update: View
Update History



Sometimes it is important for an administrator to test and verify the updates before the users can install the updates. This area allows you to see hidden updates so that they can be tested before deployment.

INSTALLED UPDATES

Installed Updates allows you to see the updates that are installed and to uninstall or change them if necessary. The Installed Updates feature is a part of the Programs and Features applet in Control Panel, which allows you to uninstall, change, and repair programs.

Updates are important to keep your Windows 7 operating system current but when Microsoft has many updates or security patches, they release service packs.

Installing Windows Service Packs

Service packs are updates to the Windows 7 operating system that include bug fixes and product enhancements. Some of the options that might be included in service packs are security fixes or updated versions of software, such as Internet Explorer.

Perform the following steps prior to installing a service pack:

1. Back up your computer.
2. Check your computer to ensure that it is not running any malware or other unwanted software.
3. Check with your computer manufacturer to see whether there are any special instructions for your computer prior to installing the service pack.

You can download service packs from Microsoft.com, receive service packs via Windows Update, or pay for a copy of the service pack to be mailed to you on disc. Before you install a service pack, read the Release Note that is provided for each service pack on Microsoft's website.

The Bottom Line

Determine the hardware requirements for Windows 7. One of the most important tasks in installing Windows 7 is to verify that the machines that you want to install Windows 7 can handle the installation. The following hardware requirements are for Windows 7:

CPU (processor)	1 GHz 32-bit or 64-bit processor
Memory (RAM)	1 GB of system memory
Hard disk	16 GB of available disk space
Video adapter	Support for DirectX 9 graphics with 128 MB of memory (to enable the Aero theme)
Optional drive	DVD-R/W drive
Network device	Compatible network interface card

Master It You are a consultant who is hired by an organization to migrate the users from Windows Vista and Windows XP to Windows 7. How would you accomplish this?

Determine which version of Windows 7 to install. Microsoft has released six versions of the Windows 7 operating system. It is very important to install the correct version of Windows 7 to match the end user's needs. The six versions are

- ◆ Windows 7 Starter
- ◆ Windows 7 Home Basic
- ◆ Windows 7 Home Premium
- ◆ Windows 7 Professional
- ◆ Windows 7 Enterprise
- ◆ Windows 7 Ultimate

Master It You are an IT manager and you must install a Windows 7 operating system that supports Windows BitLocker. Which edition of Windows 7 could you use?

Install the Windows 7 operating system. Installing Windows 7 is an easy process but it is important to plan the installation before actually installing the operating system.

You can install Windows 7 either from the bootable DVD or through a network installation using files that have been copied to a network share point. You can also launch the `setup.exe` file from within the Windows Vista operating system to upgrade your operating system.

The Windows 7 DVD is bootable. To start the installation, you simply restart your computer and boot to the DVD. The installation process will begin automatically.

Master It Your company has purchased a new computer that meets all the minimum requirements for installing Windows 7. They need Windows 7 installed on the machine. How can you install Windows 7?

Migrate users from Windows XP to Windows 7. Since the upgrade option from Windows XP to Windows 7 is not available, you can use Windows Easy Transfer to integrate settings from Windows XP to Windows 7 on the same computer.

The first step in this migration process is to copy your files to a removable media such as an external hard drive or thumb drive or to a network share. After the installation of the Windows 7 operating system, you can then migrate these files onto the Windows 7 system.

Master It Your organization needs to convert all Windows XP machines to Windows 7. What steps should you take to complete the upgrade?