Chapter 1

# Installing Windows 10

## MICROSOFT EXAM OBJECTIVES COVERED IN THIS CHAPTER:

✓ **Migrate and configure user data.**

- This objective may include but is not limited to the following subobjectives: migrate user profiles; configure folder location; configure profiles including profile version, local, roaming, and mandatory.

✓ **Configure and manage updates.**

- This objective may include but is not limited to the following subobjectives: Configure update settings, configure Windows Update policies, manage update history, roll back updates, update Windows Store apps.

Welcome to Windows 10 and the future of Microsoft Windows computing. In previous editions of Microsoft Windows, Microsoft introduced the networking world to using the cloud for storage. Windows 10 starts to take this even further.

But let's start at the beginning. Before you can master any Microsoft product, you must know about the different versions of Windows 10 and also how to properly install Windows 10. In this chapter, I will show you the many different features of Windows 10 and describe each edition. I will then show you how to install Windows 10 and set up the user profiles. This is a straightforward process that can be highly automated and user friendly.

Preparing for the installation of Windows 10 involves making sure your hardware meets the minimum requirements and is supported by the operating system. Another consideration when installing Windows 10 is whether you are 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 10 installation, you will need to activate the product through Windows Activation. This process is used to reduce software piracy. After Windows 10 is installed, you can keep the operating system up-to-date with postinstallation updates.

# Introducing Windows 10

Microsoft Windows 10 is the newest version of Microsoft's client operating system software. Windows 10 combines the best of Windows 7 and Windows 8.

At the time this book was written, Microsoft has currently released six different versions of the Windows 10 operating system:

- Windows 10 Home
- Windows 10 Professional
- Windows 10 Enterprise
- Windows 10 Education
- Windows 10 Mobility
- Windows 10 Mobility Enterprise

Two of the versions listed previously will not be covered in this book, Windows 10 Mobility and Windows 10 Mobility Enterprise. If you go to Microsoft's website, you will see both listed and you can see what each offers. But neither of them can be put onto a network, so we don't cover them in this book.

Windows 10 has been improved in many of the weak areas that plagued Windows 8. Windows 10 has a much faster boot time and shutdown compared to Windows 8. It also brings back the previous Start button that we are all so familiar with from previous editions.

The Windows 10 operating system functions are also faster than their previous counterparts. The processes for opening, moving, extracting, compressing, and installing files and folders are more efficient than they were in previous versions of Microsoft's client operating systems.

Let's take a look at some of the features of each Windows 10 edition (this is just an overview of some of the benefits to using Windows 10). Table 1.1 shows each edition and what some of the "core experiences" are for those editions.

The information in Table 1.1 and Table 1.2 was taken directly from Microsoft's website.

**TABLE 1.1** Windows 10 Core Experiences

| Feature | Home | Pro | Enterprise | Education |
|---|---|---|---|---|
| Battery saver | ● | ● | ● | ● |
| Built-in ink support | ● | ● | ● | ● |
| Cortana integration | ● | ● | ● | ● |
| Customizable Start Menu | ● | ● | ● | ● |
| Enterprise-level biometric security | ● | ● | ● | ● |
| Fast startup with Hiberboot and InstantGo | ● | ● | ● | ● |
| "Hey Cortana" hands-free activation | ● | ● | ● | ● |
| Native facial and iris recognition | ● | ● | ● | ● |
| Native fingerprint recognition | ● | ● | ● | ● |

**TABLE 1.1** Windows 10 Core Experiences *(continued)*

| Feature | Home | Pro | Enterprise | Education |
|---|---|---|---|---|
| Personal and proactive suggestions | ● | ● | ● | ● |
| Reading view | ● | ● | ● | ● |
| Reminders | ● | ● | ● | ● |
| Search web, device, and cloud | ● | ● | ● | ● |
| Snap apps (across screens on different monitors) | ● | ● | ● | ● |
| Snap assist (up to four apps on one screen) | ● | ● | ● | ● |
| Switch from PC to tablet mode | ● | ● | ● | ● |
| Talk or type naturally | ● | ● | ● | ● |
| TPM support | ● | ● | ● | ● |
| Virtual desktops | ● | ● | ● | ● |
| Windows Defender and Windows Firewall | ● | ● | ● | ● |
| Windows Update | ● | ● | ● | ● |

Now that we've looked at some of the Windows 10 core experiences, let's take a look at the business side. Table 1.2 shows each edition and what some of the "Business Experiences" are for those editions.

**TABLE 1.2** Windows 10 Business Experiences

| Feature | Home | Pro | Enterprise | Education |
|---|---|---|---|---|
| Ability to join Azure Active Directory | | ● | ● | ● |
| AppLocker | | | ● | ● |
| Assigned Access 8.1 | | ● | ● | ● |
| BitLocker | | ● | ● | ● |
| BranchCache | | | ● | ● |

| Feature | Home | Pro | Enterprise | Education |
|---|---|---|---|---|
| Client Hyper-V | | ● | ● | ● |
| Credential Guard | | | ● | ● |
| Current Branch for Business | | ● | ● | ● |
| Device Encryption | ● | ● | ● | ● |
| Device Guard | | | ● | ● |
| Direct Access | | | ● | ● |
| Domain Join | | ● | ● | ● |
| Easy Upgrade from Home to Education Edition | ● | ● | | ● |
| Easy Upgrade from Pro to Enterprise Edition | | ● | ● | |
| Enterprise Data Protection | | ● | ● | ● |
| Enterprise Mode Internet Explorer (EMIE) | | ● | ● | ● |
| Granular UX Control | | | ● | ● |
| Group Policy Management | | ● | ● | ● |
| Long Term Servicing Branch | | | ● | |
| Microsoft Passport | ● | ● | ● | ● |
| Mobile device management | ● | ● | ● | ● |
| Remote Desktop | | ● | ● | ● |
| Side-loading of line-of-business apps | ● | ● | ● | ● |
| Start Screen Control with Group Policy | | | ● | ● |
| Trusted Boot | | ● | ● | ● |
| Windows Store for Business | | ● | ● | ● |
| Windows To Go Creator | | | ● | ● |
| Windows Update | ● | ● | ● | ● |
| Windows Update for Business | | ● | ● | ● |

## Windows 10 Features

Now that we have seen which editions contain which features, let's take a look at some of the Windows 10 features in greater detail. This section describes only a few of these features, but all features will be explained throughout this book.

**Cortana Integration** Windows 10 comes with Cortana integration. Cortana is your very own personnel assistant. You can type in or ask Cortana a question, and Cortana will seek out the best possible answer based on your question.

**Secure Boot** Windows 10 gives you the ability to use hardware-based virtualization that allows Windows 10 to prevent malware from running on your system. Windows 10 Secure Boot also prevents key processes from being tampered with because Windows 10 isolates these processes from the system.

**Enterprise Data Protection** Windows 10 Enterprise Data Protection (EDP) helps protect corporate data in a world that is increasingly becoming a Bring Your Own Device (BYOD) environment. Since many organizations are allowing employees to connect their own devices to their network, the possibility of corporate data being compromised because of non-corporate programs running on these personnel devices is increasing. For example, many third-party apps may put corporate data at risk by accidently disclosing corporate information through the application.

Enterprise Data Protection helps protect information by separating corporate applications and corporate data from being disclosed by personal devices and personal applications.

**Device Guard** Because employees can use multiple types of Windows 10 devices (Surface Pros, Windows Phones, and Windows 10 computer systems), Device Guard is a feature that helps guarantee that only trusted applications will run on any of these devices.

Device Guard uses both hardware and software security features to lock down a device so it can run only trusted and approved applications. This also helps protect against hackers from running malicious software on these devices.

**Microsoft Passport** Windows 10 allows administrators to replace passwords with other types of authentication on the operating system. Microsoft Passport allows for multifactor authentication by using a combination of an enrolled device and biometric authentication or a personal identification number (PIN).

Microsoft has encompassed the use of your Microsoft account with the use of your corporate account. So with Windows 10, Microsoft Passport can log you into your domain as well as into the cloud and Microsoft websites. The user will be required to verify their Microsoft Passport account, and that account will then be tied into a gesture or PIN, and from that point on, the user will not need to use a password to log in to the device and their protected resources. Because no password will be needed, this helps prevent hackers from using software to hack a password on an account.

**Start Menu** Windows 10 has brought back the Start Menu that users are familiar with. The Windows 10 Start Menu combines the best of both Windows 7 and Windows 8. So the Start Menu gives you a menu that we were familiar with in Windows 7 as well as the Live Tiles that users liked in Windows 8.

**Microsoft Edge and Internet Explorer 11** Windows 10 has introduced a new way to surf the Internet with Microsoft Edge. But Windows 10 also still comes with Internet Explorer 11 in the event that you need to run ActiveX controls or run backward-compatible web services or sites.

Microsoft Edge allows users to start using many new Microsoft features, including Web Note (allows you to annotate, highlight, and call things out directly on web pages), Reading View (allows you to print and save as a PDF for easy reading), and Cortana (personal assistant).

**Domain Join and Group Policy** Depending on the version of Windows 10 that you are using, administrators have the ability to join Windows 10 clients to either a corporate version of Active Directory or a cloud-based version of Azure Active Directory.

**Windows Store for Business** Microsoft Store has included many applications that allow users to get better functionality and productivity out of their Windows 10 devices. One advantage for corporations is that they can create their own applications and load them into the Microsoft Store for users to download (called *sideloading*).

**Mobile Device Management** Mobile Device Management (MDM) allows administrators to set up Windows 10 policies that can integrate many corporate scenarios, including the ability to control users' access to the Windows Store and the ability to use the corporate VPN. MDM also allows administrators to manage multiple users who have accounts set up on Microsoft Azure Active Directory (Azure AD). Windows 10 MDM support is based on the Open Mobile Alliance (OMA) Device Management (DM) protocol 1.2.1 specification.

**Real World Scenario**

**Choosing an Appropriate Operating System**

As an IT consultant, I have clients who want to stay on the leading edge of technology but don't have the money to replace all of their equipment. This is where I have to convince the client that it is better to slowly migrate their equipment.

Try presenting a timeline to your customers or organization that shows the migration to Windows 10. Your clients will be happy, and you will have the time needed to migrate your organization.

I understand that if you are reading this book, there is the strong likelihood that you are getting ready to install or upgrade to Windows 10 in your organization.

Microsoft has taken the best of Windows 7 and Windows 8 and created Windows 10. In a corporate environment, if you have machines running Windows 8, most will have a free upgrade to Windows 10, which will improve performance. But if you have clients who are comfortable and happy with Windows 7, a decision will need to be made about whether to stay with Windows 7 or upgrade to Windows 10.

## Windows Feature Deprecation

With the release of its newest operating system, Microsoft has decided that some of the features you may be used to are no longer needed. Here are some of the features that have been deprecated:

- Windows 7 desktop gadgets will be removed as part of Windows 10.
- The Solitaire, Minesweeper, and Hearts games that come preinstalled on Windows 7 will be removed. Microsoft has released versions of Solitaire and Minesweeper called the "Microsoft Solitaire Collection" and "Microsoft Minesweeper."
- Mobile Device Management functionality will not be available in Windows 10 Home edition.
- Users with floppy drives will need to download the latest driver from Windows Update or from the manufacturer's website.
- Users who have Windows Live Essentials installed on their systems will lose the One-Drive application, which will be replaced with the inbox version of OneDrive.
- OneDrive will no longer support placeholder files in Windows 10. Windows 10 users can choose which folders they want to sync from OneDrive settings.
- When upgrading Windows 10 with versions of previous operating systems that support Media Center, Windows Media Center will be removed. For a limited time on systems that were upgraded to Windows 10 from one of these versions of Windows, a DVD playback app, Windows DVD Player, will be installed. If the Windows DVD Player does not install immediately, it will be installed after the first successful Windows update.

# Windows 10 Architecture

Windows 10 has limited the number of files that load at system startup to help with the core performance of the operating system. Microsoft has also removed many of the fluff items that Windows Vista used, allowing for better performance.

Microsoft offers both a 32-bit version and a 64-bit version of Windows 10. The terms *32-bit* and *64-bit* refer to the CPU, or processor. The number represents how the data is processed. It is processed either as $2^{32}$ or $2^{64}$. The larger the number, the larger the amount of data that can be processed at any one time.

To get an idea of how 32-bit and 64-bit processors operate, think of a large highway with 32 lanes. Vehicles can travel on those 32 lanes only, so when traffic gets backed up, the result is delays. Now think of how many more vehicles can travel on a 64-lane highway. The problem here is that a 32-lane highway can't handle the number of vehicles a 64-lane highway can. You need to have the infrastructure to allow for that volume of vehicles. The same is true for computers. Your computer has to be configured to allow you to run a 64-bit processor.

So what does all of this mean to the common user or administrator? It's all about random access memory, or RAM. A 32-bit operating system can handle up to 4 GB of RAM, and a 64-bit processor can handle up to 16 exabytes of RAM. None of this is new. Although 64-bit processors are just starting to get accepted with Windows systems, other operating systems, such as Apple, have been using 64-bit processors for many years.


Computer processors are typically rated by speed. The speed of the processor, or central processing unit (CPU), is rated by the number of clock cycles that can be performed in 1 second. This measurement is typically expressed in gigahertz (GHz). One GHz is one billion cycles per second. Keep in mind that processor architecture must also be taken into account when considering processor speed. A processor with a more efficient pipeline will be faster than a processor with a less-efficient pipeline at the same CPU speed.

Now that you have seen the new features of Windows 10, let's look at how to prepare the machine to install Windows 10.

# Preparing to Install Windows 10

Installing Windows 10 can be relatively simple because of the installation wizard. The installation wizard will walk you through the entire installation of the operating system.

The most difficult part of installing Windows 10 is preparing and planning for the installation. One thing I often say to IT professionals is, "An hour of planning will save you days of work." Planning a Windows 10 rollout is one of the hardest and most important tasks that you will perform when installing Windows 10.

There are many decisions that should be made before you install Windows 10. The first decision is which version of Windows 10 you want to install. As mentioned previously, Microsoft has six different versions of the Windows 10 operating system. This allows an administrator to custom-fit a user's hardware and job function to the appropriate version of Windows 10. Many times, Microsoft releases multiple editions of the operating system

contained within the same Windows 10 media disk. You can choose to unlock the one you want based on the product key you have. Let's take a closer look at the different versions of Windows 10.


In this book, we will not talk much about Windows 10 Education. Windows 10 Education is the counterpart to Windows 10 Enterprise, but it is a volume-licensed version of Windows 10 that is specifically priced for educational institutions. Educational institutions receive the same Enterprise functionality, but they pay much less than a corporation.

## Windows 10 Home

Windows 10 Home is the main operating system for home users. Windows 10 Home offers many features, including these:

- Broad application and device compatibility with unlimited concurrent applications
- A safe, reliable, and supported operating system
- Microsoft Passport
- HomeGroup, which allows a user to easily share media, documents, and printers across multiple PCs in homes or offices without the need of a domain
- Improved Taskbar and Jump Lists (Jump Lists is a feature in Windows 10 that allows you to quickly access files that you have been working on.)
- Live thumbnail previews and an enhanced visual experience
- Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- View Available Networks (VAN) (Windows 10 by default has the ability, when you use a wireless network adapter, to choose the wireless network that you want to connect to by using the wireless network adapter properties.)
- Device Encryption
- Easy networking and sharing across all your PCs and devices
- Windows Update
- Multitouch
- Improved handwriting recognition

## Windows 10 Professional

Windows 10 Professional is designed for small-business owners. Microsoft designed Windows 10 Professional for users to get more done and safeguard their data. Professional offers the following features:

- Broad application and device compatibility with unlimited concurrent applications
- A safe, reliable, and supported operating system
- Microsoft Passport
- Domain Join
- Improved Taskbar and Jump Lists
- Enterprise Mode Internet Explorer (EMIE)
- Advanced networking support (ad hoc wireless networks and Internet connection sharing)
- View Available Networks (VAN) (Windows 10 by default has the ability, when you use a wireless network adapter, to choose the wireless network that you want to connect to by using the wireless network adapter properties.)
- Mobility Center
- Action Center, which makes it easier to resolve many IT issues yourself
- Easy networking and sharing across all your PCs and devices
- Group Policy Management
- Windows Update and Windows Update for Business
- Multitouch
- Improved handwriting recognition
- Domain Join, which enables simple and secure server networking
- BitLocker, which protects data on removable devices
- Device Encryption
- Encrypting File System, which protects data
- Client Hyper-V
- Location Aware Printing, which helps find the right printer when moving between the office and home
- Start Menu that includes Live Tiles

## Windows 10 Enterprise

Windows 10 Enterprise is the version designed for midsize and large organizations. This operating system has the most features and security options of all Windows 10 versions. Here are some of the features:

- Broad application and device compatibility with unlimited concurrent applications.
- A safe, reliable, and supported operating system.
- Microsoft Passport.
- Enterprise Mode Internet Explorer (EMIE).

- Group Policy Management.
- Windows Update and Windows Update for Business.
- Advanced networking support (ad hoc wireless networks and Internet connection sharing).
- View Available Networks (VAN). Windows 10 by default has the ability, when you use a wireless network adapter, to choose the wireless network that you want to connect to by using the wireless network adapter properties.
- Mobility Center.
- Easy networking and sharing across all your PCs and devices.
- Multitouch.
- Start menu that includes Live Tiles.
- Improved handwriting recognition.
- Domain Join, which enables simple and secure server networking.
- Device Encryption.
- Encrypting File System, which protects data.
- Location Aware Printing, which helps find the right printer when you are moving between the office and home.
- Client Hyper-V.
- Credential Guard.
- Device Guard.
- 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, which restricts unauthorized software and also enables greater security hardware requirements

Before you can install the operating system, you must make sure the machine's hardware can handle the Windows 10 operating system.

To install Windows 10 successfully, your system must meet or exceed certain hardware requirements. Table 1.3 lists the minimum requirements for a Windows 10–capable PC.

**TABLE 1.3** Hardware requirements

| Component | Requirements |
|---|---|
| CPU (processor) | 1 GHz or faster processor or system-on-a-chip (SoC) |
| Memory (RAM) | 1 GB for 32-bit or 2 GB for 64-bit |

| Component | Requirements |
|---|---|
| Hard disk | 16 GB for 32-bit OS 20 GB for 64-bit OS |
| Video adapter | DirectX 9 or later with WDDM 1.0 driver |
| Optional drive | DVD-R/W drive |
| Network device | Compatible network interface card |


The hardware requirements listed in Table 1.3 are those specified at the time this book was written. Always check the Microsoft website for the most current information.

The Windows 10–capable PC must meet or exceed the basic requirements to deliver the core functionality of the Windows 10 operating system. These requirements are based on the assumption that you are installing only the operating system, without any premium functionality. For example, you may be able to get by with the minimum requirements if you are installing the operating system just to learn the basics of the software. Remember, the better the hardware, the better the performance.

**Real World Scenario**

**Deciding on Minimum Hardware Requirements**

The company you work for has decided that everyone will have their own laptop running Windows 10. You need to decide on the new computers' specifications for processor, memory, and disk space.

The first step is to determine 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 of whether the RAM and processor calculations you have made for your environment are going to provide a 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. At the time this book was written, 500 GB drives were 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 will be implementing applications that are memory or processor intensive, you may want to spec out the computers with hardware sufficient to support upcoming needs to avoid costly upgrades in the near future.

The requirements for the graphics 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.

**Measurement Used for Disk Space and Memory**

Hard disks are commonly rated by capacity. The following measurements are used for disk space and memory capacity:

- 1 MB (megabyte) = 1,024 KB (kilobytes)
- 1 GB (gigabyte) = 1,024 MB
- 1 TB (terabyte) = 1,024 GB
- 1 PB (petabyte) = 1,024 TB
- 1 EB (exabyte) = 1,024 PB

If you are not sure if your machine meets the minimum requirements, Microsoft includes some tools that can help you determine if a machine is Windows 10 compatible, which we will look at in the following sections.

## The Hardware Compatibility List

Along with meeting the minimum requirements, whenever possible 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 10 operating system. To determine if your computer and peripherals are on the HCL, check the most up-to-date list at

```
https://msdn.microsoft.com/en-us/library/windows/hardware/
dn922588(v=vs.85).aspx
```

The Windows 10 operating system 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 10. Microsoft guarantees that the items on the list meet the requirements for Windows 10 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.

### BIOS Compatibility

Before you install Windows 10, you should verify that your computer has the most current BIOS. This is especially important if your current BIOS does not include support for Advanced Configuration and Power Interface (ACPI) functionality. ACPI functionality is required for Windows 10 to function properly. Check the computer vendor's website for the latest BIOS version information.

### Driver Requirements

To successfully install Windows 10, you must have the critical device drivers for your computer, such as the hard drive device driver. The Windows 10 media come with an extensive list of drivers. If your computer's device drivers are not on the Windows 10 installation media, you should check the device manufacturer's website.

## New Install or Upgrade?

Once you've determined that your hardware meets the minimum requirements, you need to decide whether you want to do an upgrade or a clean install. 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 10.

The bad news is that if you are moving from Windows Vista, Windows XP, or earlier versions of Windows to Windows 10, you must perform a clean install. (You can, however, use the Windows Easy Transfer utility to migrate files and settings from Windows XP to Windows 10 on the same computer.)

You can perform an upgrade to Windows 10 if the following conditions are true:

- You are running Windows 7 or Windows 8.
- 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 10 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 10 (such as DOS, Windows 9*x*, Windows NT, Windows Me, Windows 2000 Professional, Windows Vista, or Windows XP).
- You want to start from scratch, without keeping any existing preferences.
- You want to be able to dual-boot between Windows 10 and your previous operating system.

Table 1.4 shows each operating system that can be upgraded and the edition of Windows 10 to which it should be upgraded.

**TABLE 1.4** Windows 7 and Windows 8 upgrade options

| From Current Edition | Windows 10 Edition |
|---|---|
| Windows 7 Starter | Windows 10 Home |
| Windows 7 Home Basic | Windows 10 Home |
| Windows 7 Home Premium | Windows 10 Home |
| Windows 7 Professional | Windows 10 Pro |
| Windows 7 Ultimate | Windows 10 Pro |
| Windows 7 Enterprise | Windows 10 Enterprise |
| Windows Phone 8.1 | Windows 10 Mobile |
| Windows 8.1 Home | Windows 10 Home |
| Windows 8.1 Pro | Windows 10 Pro |
| Windows 8.1 Enterprise | Windows 10 Enterprise |
| Windows 8.1 Pro for Students | Windows 10 Pro |

## Upgrade Considerations

Almost all Windows 7 and Windows 8 applications should run with the Windows 10 operating system. However, possible exceptions to this statement include the following:

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

Before upgrading to Windows 10, be sure to stop any antivirus scanners, network services, or other client software. These software packages may see the Windows 10 install as a virus and cause installation issues.

If you are performing a clean install to the same partition as an existing version 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

You need to ensure that you have Windows 10 device drivers for your hardware. If you have a video driver without a Windows 10–compatible driver, the Windows 10 upgrade will install the Standard VGA driver, which will display the video with an 800×600 resolution. Once you get the Windows 10 driver for your video, you can install it and adjust video properties accordingly.

## Application Compatibility Issues

Not all applications that were written for earlier versions of Windows will work with Windows 10. After the upgrade, if you have application problems, you can address the problems in any of the following ways:

- If the application is compatible with Windows 10, 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 10. 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 versions of Windows but are incompatible with Windows 10, use the Windows 10 Program Compatibility Wizard. From the 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 10, upgrade your application to a Windows 10–compliant version.

## An Upgrade Checklist

Once you have made the decision to upgrade, you should develop a plan of attack. The following upgrade checklist (valid for upgrading from Windows 7 or Windows 8) will help you plan and implement a successful upgrade strategy:

- Verify that your computer meets the minimum hardware requirements for Windows 10.

- Be sure your hardware is on the HCL.
- Make sure you have the Windows 10 drivers for the hardware. You can verify this with the hardware manufacturer.
- To audit the current configuration and status of your computer, run the Get Windows 10 App tool from the Microsoft website, which also includes documentation on using the utility. 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 10.
- Make sure your BIOS is current. Windows 10 requires that your computer has the most current BIOS. If it does not, it 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 because 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. Likewise, if you don't have a valid backup, you will likely have 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 hard 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 hard drive for the upgrade.
- Perform the upgrade. In this step, you upgrade from the Windows 7 or Windows 8 operating system to Windows 10.
- Verify your configuration. After Windows 10 has been installed, use the inventory to compare and test each element that was 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 may not work. If this happens, you may want to return your computer to the original, working configuration.

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

## Disk 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:

- C: drive, which might be 200 GB
- D: drive, which might be 150 GB
- E: drive, which might be 150 GB

The following sections detail some of the major considerations for disk partitioning:

**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 10. 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.

**The System and Boot Partitions** When you install Windows 10, 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 10 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 10 operating system files. By default, the Windows operating system files are located in a folder named `Windows`.

**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 10 operating system.

You might want to create only the first partition where Windows 10 will be installed. You can then use the Disk Management utility in Windows 10 to create any other partitions you need. The Windows 10 Disk Management utility is covered in Chapter 3, "Configuring Storage and Security."

## Language and Locale

Language and locale settings determine the language the computer will use. Windows 10 supports many languages for the operating system interface and utilities.

Locale settings are for configuring the format for items such as numbers, currencies, times, and dates. For example, English for the United States specifies a short date as mm/dd/yyyy (month/day/year), while English for South Africa specifies a short date as yyyy/mm/dd (year/month/day).

# Installing Windows 10

You can install Windows 10 either from the bootable DVD or through a network installation using files that have been copied to a network share point or USB device. You can also launch the `setup.exe` file from within the Windows 10 operating system to upgrade your operating system.

To start the installation, you simply restart your computer and boot to the DVD. The installation process will begin automatically. You will walk through the steps of performing a clean install of Windows 10 from the DVD in Exercise 1.1.

If you are installing Windows 10 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 10 distribution files copied to a shared folder. The following steps are used to install Windows 10 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 10 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 10

On any installation of Windows 10, there are three stages.

**Collecting Information** During the collection phase of the installation, Windows 10 gathers the information necessary to complete the installation. This is where Windows 10 gathers your local time, location, keyboard, license agreement, installation type, and installation disk partition information.

**Installing Windows** This section of the installation is where your Windows 10 files are copied to the hard disk and the installation is completed. This phase takes the longest because the files are installed.

**Setting Up Windows** In this phase, you set up a username, computer name, and password; enter the product key; configure the security settings; and review the date and time. Once this is finished, your installation will be complete.

As explained earlier, you can run the installation from the optical media, from a USB, or over a network. The only difference in the installation procedure is your starting point: from your optical drive or USB or a network share. The steps in Exercise 1.1 and Exercise 1.2 assume you are using the Windows 10 DVD to install Windows 10.

### Setting Up Your Computer for Hands-On Exercises

Before beginning Exercise 1.1, verify that your computer meets the requirements for installing Windows 10, as listed earlier in Table 1.3. For Exercise 1.1, it is assumed you are not currently running a previous version of Windows that will be upgraded.

The exercises in this book are based on your computer being configured in a specific manner. Your computer should have at least a 50 GB hard drive (this exceeds the basic minimums) that is configured with the minimum space requirements and partitions.

When you boot to the Windows 10 installation media, the Setup program will automatically start the Windows 10 installation. In Exercise 1.1, you will perform a clean install of Windows 10. This exercise assumes that you have access to Windows 10 Enterprise; other editions may vary slightly. You can also download an evaluation version of Windows 10 from the Microsoft website.

Also, I may list steps that you may not see or I may not list steps that you see—this is because my version of Windows may be different. For example, I am installing an MSDN Windows 10 Enterprise edition. At this time, I am not required to enter a license number during install. A normal version bought from a vendor may ask for the license during the actual install.


I am loading Windows 10 Enterprise into a VMware Workstation virtual machine. Again, this may make your installation a little different than the steps listed in Exercise 1.1.

## EXERCISE 1.1

### Performing a Clean Install of Windows 10

1. Insert the Windows 10 DVD into a machine or virtual machine with no operating system and start the computer.
2. If you are directed to "Hit any key" to start the DVD, press Enter.
3. The first screen will ask you to enter your language, time and currency format, and keyboard or input method (see Figure 1.1). After filling in these fields, click Next.

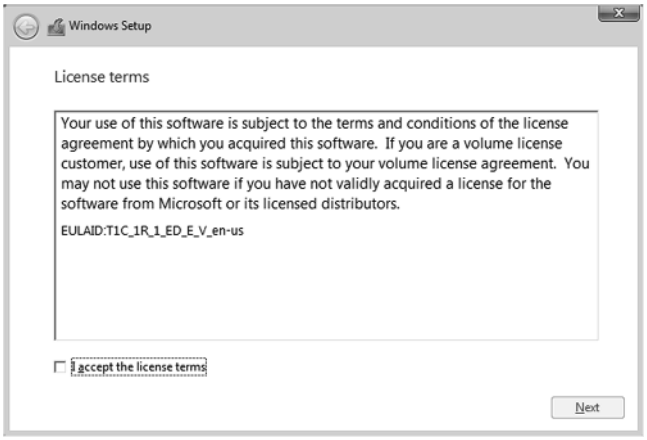
**FIGURE 1.1** Windows Setup screen


4. On the next screen, click the Install Now button (see Figure 1.2).

**FIGURE 1.2** Windows install screen


5. A message appears to tell you that the setup is starting. The licensing screen will be first. Read the license agreement and then check the I Accept The License Terms check box (see Figure 1.3). Click Next.

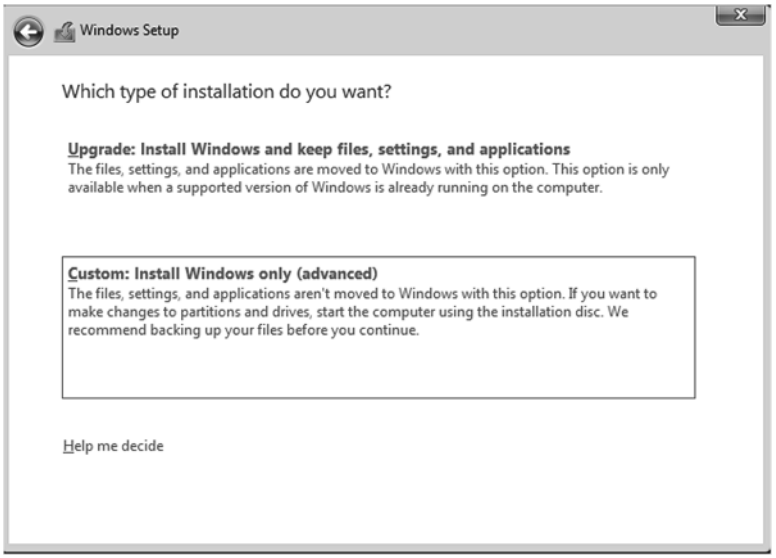
**FIGURE 1.3** Windows license screen




6. When asked which type of installation you want, click Custom (Advanced) as shown in Figure 1.4.

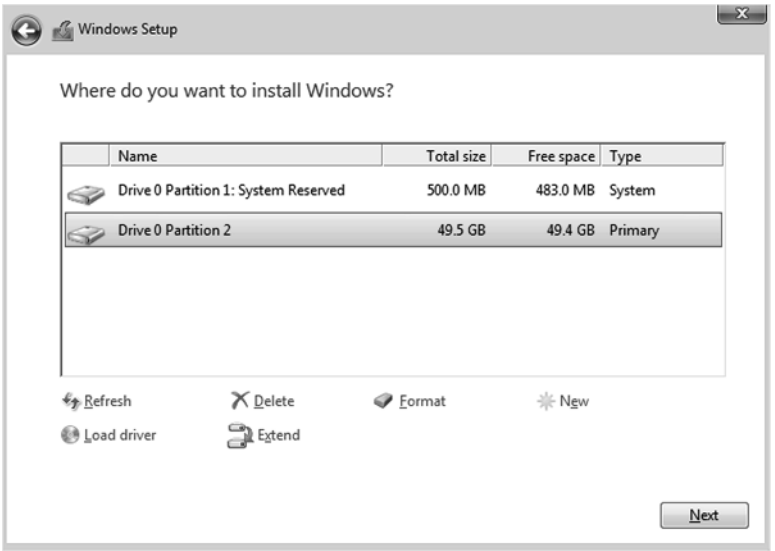
**EXERCISE 1.1 *(continued)***

**FIGURE 1.4** Type of install screen




7. The next screen asks you to identify the disk to which you would like to install Windows 10. Choose an unformatted free space or a partition (partition will be erased) with at least 50 GB available. You can also click the Drive Options (Advanced) link to create and format your own partition as shown in Figure 1.5. After you choose your partition, click Next.

**FIGURE 1.5** Windows disk setup screen

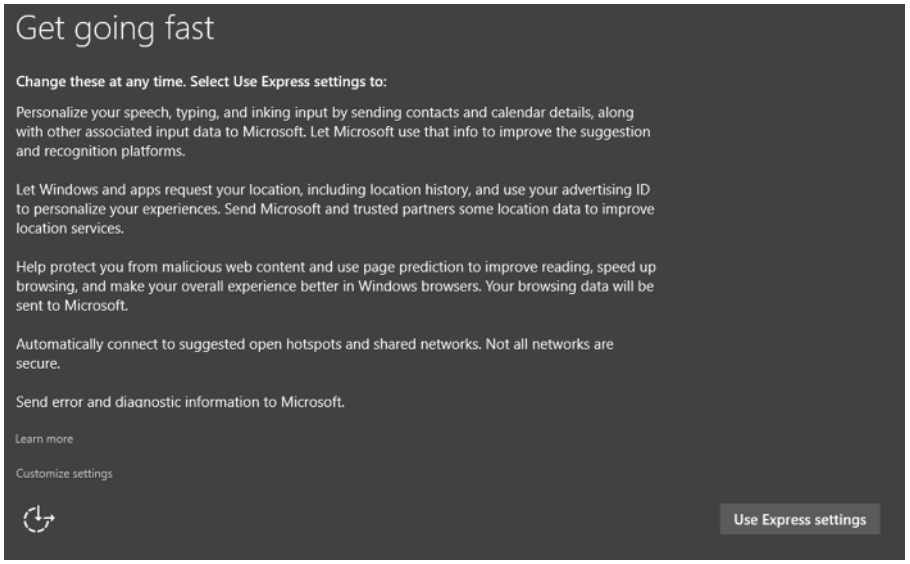


8. When your partition is set, the installation will start (as shown in Figure 1.6). You will see the progress of the installation during the entire process. When the installation is complete, the machine will reboot.

**FIGURE 1.6** Windows installation status screen


9. After the system restarts, a screen appears that asks if you want to use custom or express settings, as shown in Figure 1.7. Click the Use Express Settings button. The system will then restart.

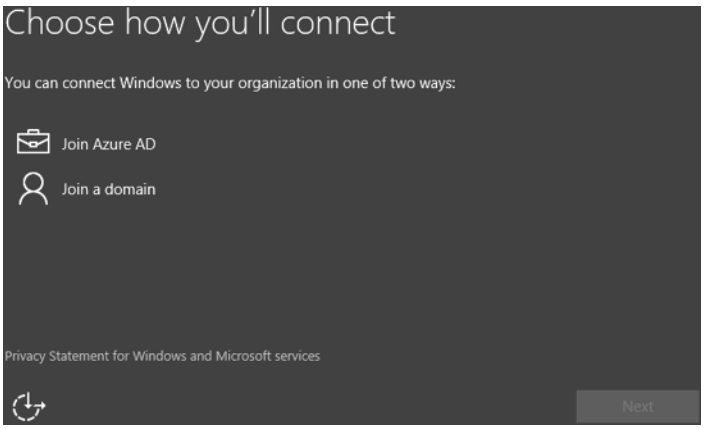
**FIGURE 1.7** Windows express settings screen



**EXERCISE 1.1 *(continued)***

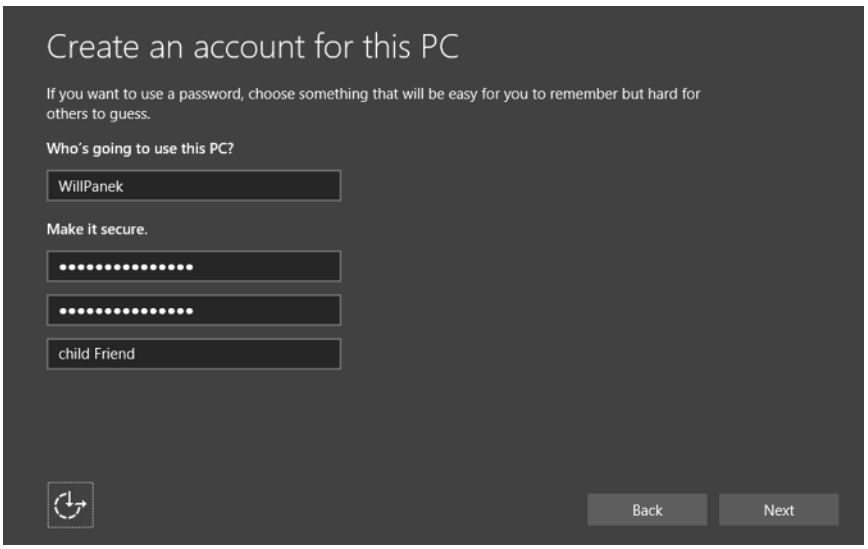
**10.** After the restart, a screen appears that asks you to choose how you will connect. Select Join A Domain (see Figure 1.8), and then click the Next button.

**FIGURE 1.8** Choosing a domain




**11.** The next screen asks you to enter a username and password. Type in your username, password, and a password hint, as shown in Figure 1.9. Then click Next.

**FIGURE 1.9** PC account screen



The Hi screen will appear, and the system will continue its setup. Then the system applications will be installed.

12. You will be asked if you want your system to be recognized by other systems on the network. This is a choice you can make. If you want other machines to see this Windows 10 system, choose Yes.

    Once Windows 10 finishes its installation, you should see the Windows 10 desktop, as shown in Figure 1.10.

**FIGURE 1.10** Windows 10 screen


Before we talk about the Windows 10 upgrade procedure, I want to quickly explain something that you saw during the Windows 10 install. In step 10, I had you choose Join A Domain instead of Azure AD. We will explore both of the choices in greater detail, but I wanted to quickly explain why we chose one over the other.

Microsoft offers two main networks: workgroup-based or domain-based. *Workgroups* (also referred to also as peer-to-peer networks) is when you just connect your computers together directly to each other. A perfect example for most of us is what you do in your home network. Most home users connect their machines together without the use of a main server.

Corporations normally do things a bit differently than that. *Domains* are networks that are controlled by servers called domain controllers. Domain controllers are Windows servers that have a copy of a database called Active Directory (AD). Recently Microsoft took domain-based networks a step further by allowing companies to set up a cloud-based version of an Active Directory domain (Azure AD). This means that companies no longer need to maintain and manage their own domain controllers. Since most people don't have a cloud-based version of Azure AD, I had you choose the option Join A Domain so that we could finish the Windows 10 install.

We will go over all of these options in greater detail throughout this book, but I wanted to introduce you to these two Windows 10 options.

## Performing an Upgrade to Windows 10

This section describes how to perform an upgrade to Windows 10 from Windows 8.1. Similar to a clean install, you can run the installation from the installation DVD, from a USB, or over a network. The only difference in the installation procedure is your starting point: from your optical or USB drive or from a network share. For the steps in the following sections, it is assumed that you are using the Windows 10 DVD to install the Windows 10 operating system.

Upgrading a Windows 7 or Windows 8.1 system to Windows 10 will save you a lot of time and trouble. Because we are upgrading the system, all of the user's data and applications will remain installed and most likely still work the exact same way. Sometimes when we upgrade a system, we run into problems with applications. But many times that is caused by a driver or a needed software update that will most likely solve the issue.

The three main steps in the Windows 10 upgrade process are very similar to the ones for a clean install. The three steps of upgrading to Windows 10 are as follows:

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

In Exercise 1.2, you will go through the process of installing Windows 10 by upgrading Windows 8.1. As you can see in Figure 1.11, I have a Windows 8.1 Enterprise system that I will update to Windows 10 Enterprise.

**FIGURE 1.11** Windows 8.1


## EXERCISE 1.2

### Upgrading Windows 8.1 to Windows 10

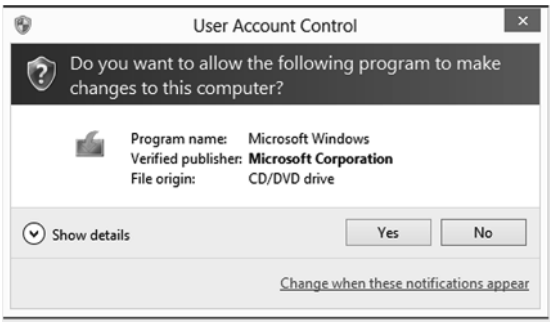
1. Insert the Windows 10 DVD. (We are upgrading Windows 8.1 Enterprise to Windows 10 Enterprise.)
2. If Autorun does not start, navigate to the DVD drive and click `setup.exe`. Once the setup starts (via either `setup.exe` or Autorun), click Run Setup.exe as shown in Figure 1.12.

**FIGURE 1.12** DVD setup screen

**EXERCISE 1.2 *(continued)***

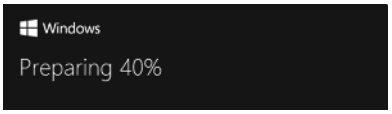
3. If a pop-up box appears for User Account Control, click the Yes button (see Figure 1.13).

**FIGURE 1.13** User Account Control screen



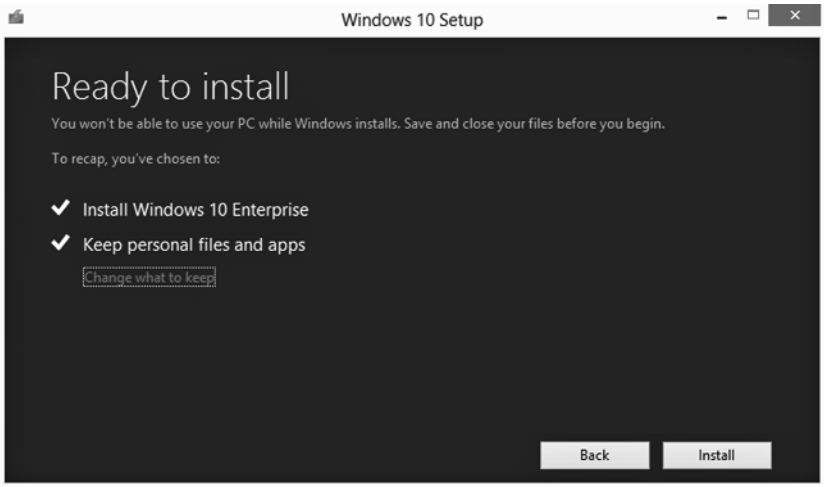

You should then see a message appear stating that Windows is preparing the system, as shown in Figure 1.14.

**FIGURE 1.14** Preparing screen



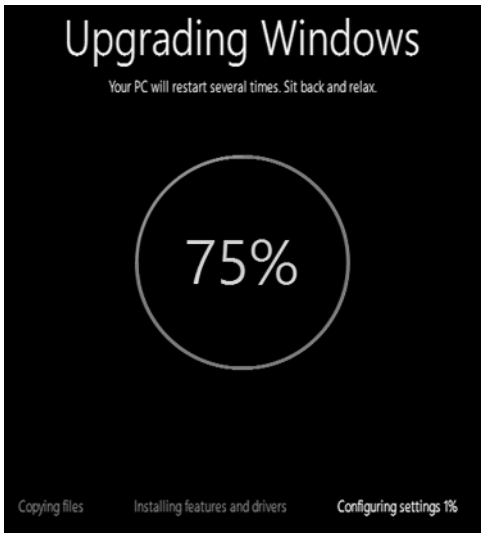

4. You may be prompted to Get Important Updates. You can choose to either download the updates or not do them at this time. Make a choice and click the Next button. (During my installation, I decided to download the updates.)
5. The Microsoft Windows 10 license terms appear. Read the terms and then click Accept. (The installation will not allow you to continue until you click Accept.)
6. At the Ready To Install screen (shown in Figure 1.15), you can change what files and/or apps you want to keep by clicking the Change What To Keep link. Once you're ready, click the Install button.

**FIGURE 1.15** Ready To Install screen




7. Windows 10 will begin to install (as shown in Figure 1.16). Your computer may restart multiple times. This is normal. As the upgrade status screen states, "Sit back and relax."

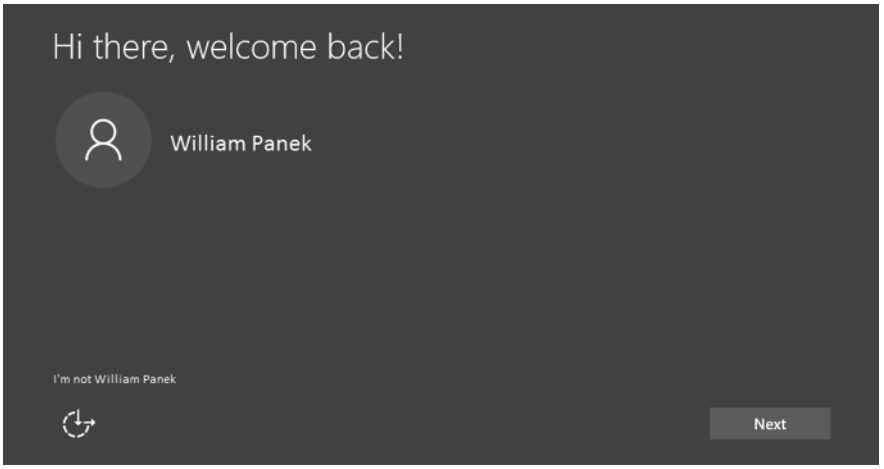
**FIGURE 1.16** Installing Status screen



**EXERCISE 1.2 *(continued)***

8. After the upgrade has completed, a welcome screen will be displayed, similar to the one shown in Figure 1.17. Click Next.

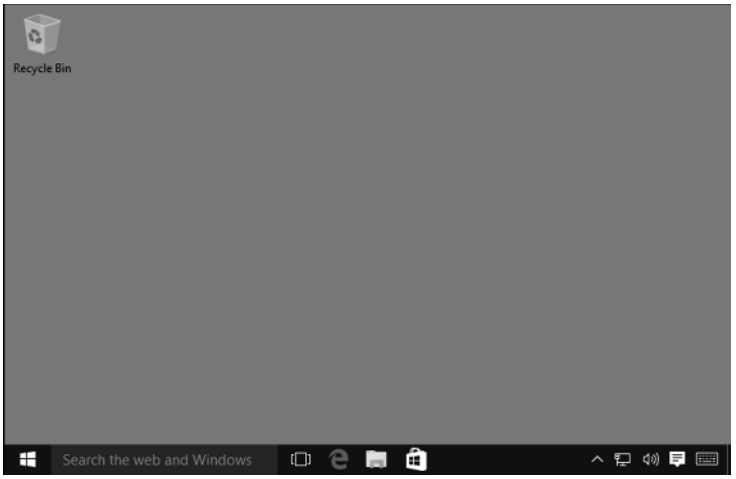
**FIGURE 1.17** Welcome screen




9. At the Get Going Fast screen, click the Use Express Settings button.
10. At the New Apps screen, just click Next.

And that's it—Windows 10 is installed (see Figure 1.18). Congrats.

**FIGURE 1.18** Windows 10 screen



# Troubleshooting Installation Problems

The Windows 10 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, it is possible that errors will occur.

## Identifying Common Installation Problems

As most of you are aware, installations sometimes do get errors. You might encounter some of the following installation errors:

**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 may just need to be cleaned.

**Insufficient Disk Space** Windows 10 needs at least 16 GB for the 32-bit OS and 20 GB for the 64-bit OS to execute properly. If the Setup program cannot verify that this space exists, the program will not let you continue.

**Not Enough Memory** Make sure your computer has the minimum amount of memory required by Windows 10 (1 GB for 32-bit or 2 GB for 64-bit). Having insufficient memory may cause the installation to fail or blue-screen errors to occur after installation.

**Not Enough Processing Power** Make sure your computer has the minimum processing power required by Windows 10 (1 GHz or faster processor or SoC). Having insufficient processing power may 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 10 may not recognize the hardware or the device may not work properly.

**Hardware with No Driver Support** Windows 10 will not recognize hardware without driver support.

**Hardware That Is Not Configured Properly** If your hardware is Plug and Play (PnP) compatible, Windows 10 should configure it automatically. If your hardware is not Plug and Play compatible, you will 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 you have not typed in an incorrect key (check your Windows 10 installation folder or your computer case for this key).

**Failure to Access TCP/IP Network Resources** If you install Windows 10 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 be unable to access network resources through TCP/IP if the other network clients are using DHCP addresses.

**Installing Nonsupported Hard Drives** If your computer is using a hard disk that does not have a driver included on the Windows 10 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 10 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 10, the Setup program creates several log files. You can view these logs to check for any problems during the installation process. 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 Exercise 1.3, you will view the Windows 10 Setup logs to determine whether there were any problems with your Windows 10 installation.

**EXERCISE 1.3**

**Troubleshooting 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 are finished 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 are finished viewing this file, close Notepad.
6. Close the directory window.

## 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)*. USMT can help you migrate user profiles, configure folder locations for uploads and downloads of user data, and configure profile versions: local, roaming, and mandatory.

## User State Migration Tool

You can download a utility called USMT that is used by administrators to migrate large numbers of users over automated deployments. USMT for Windows 10 is now part of the Windows Assessment and Deployment Kit (ADK). USMT is similar to Windows Easy Transfer, with the following differences:

- USMT is more configurable and can use XML files to specify which files and settings are transferred.
- USMT is scriptable and uses command-line utilities to save and restore user files and settings.

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 purpose of these files is 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. ScanState is used on the machine you are migrating from.
- `Loadstate.exe` then deposits the information that is collected to a computer running a fresh copy of Windows 10. The `Config.xml` file can be used to help exclude files and settings during the LoadState process. The LoadState command is used to bring the user data that was collected from the ScanState utility over to the new Windows 10 system.

The following information is migrated:

- 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 filename extensions, including `.doc`, `.dot`, `.rtf`, `.txt`, `.wps`, `.wri`, `.xls`, `.csv`, `.wks`, `.ppt`, `.pps`, `.pot`, `.pst`, and more
- Access control lists (ACLs)

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

A decision point that exists while using USMT is to determine if you want to perform a side-by-side installation or a wipe-and-load installation.

**Side-by-Side Installation** A side-by-side installation means that you have the new computer and the old computer. You use ScanState to collect the user's data. You then store that data on an intermediate store. After the installation of Windows 10 on a new machine, you use LoadState to move the data from the intermediate store to the new computer.

**Wipe-and-Load Installation** A wipe-and-load installation means that you have the old computer only. You will install Windows 10 on the same machine as the previous operating system. You use ScanState to collect the user's data. You then store that data on an intermediate store. After the installation of Windows 10 on the machine, you use LoadState to move the data from the intermediate store to the old computer.

USMT is downloadable software from Microsoft's website. In its simplest form, you use 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 10 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 USMT, you can create a script that can be run manually or can be used as an automated process at a scheduled time. Table 1.5 defines the options for the `Scanstate.exe` and `Loadstate.exe` commands.

**TABLE 1.5** Options for `Scanstate.exe` and `Loadstate.exe`

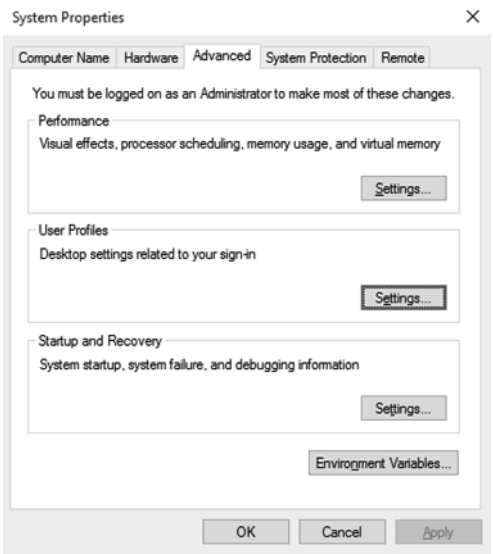
| Option | Description |
|---|---|
| `/config` | Specifies the `Config.xml` file that should be used |
| `/encrypt` | Encrypts the store (`Scanstate.exe` only) |
| `/decrypt` | Decrypts the store (`Loadstate.exe` only) |
| `/nocompress` | Disables data compression |

| Option | Description |
|---|---|
| `/genconfig` | Generates a `Config.xml` file but does not create a store |
| `/targetxp` | Optimizes ScanState for use with Windows XP |
| `/all` | Migrates all users |
| `/ue` | User exclude: excludes the specified user |
| `/ui` | User include: includes the specified user |
| `/uel` | Excludes user based on last login time |
| `/v verboselevel` | Used to identify what verbosity level will be associated with the log file on a scale of 0–13, with 0 being the least verbose |

## Migrating Profiles

Even an operating system that you install has a user profile. User profiles are created when a user logs into a system for the first time. The user profile is a group of settings that make the computer look and work the way you want it to. It contains your settings for desktop backgrounds, screen savers, pointer preferences, sound settings, and other features. Each user account has at least one user profile associated with it. To view the user profiles on a system, you view the Advanced tab of the System Properties (see Figure 1.19).

**FIGURE 1.19** User Profiles Settings button



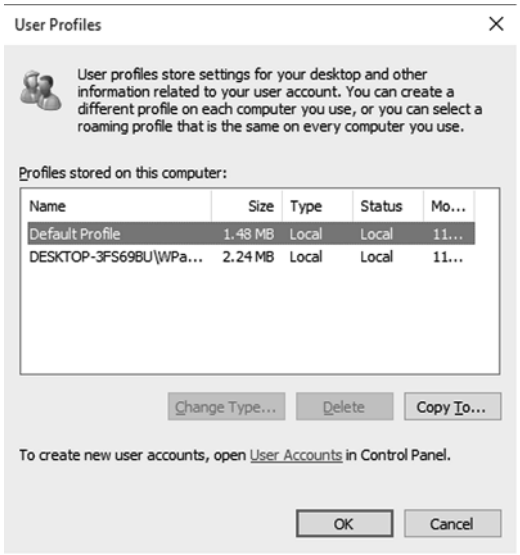
User profiles ensure that your personal preferences are used whenever you log on to Windows. User profiles are not user accounts; rather, they specify how the user account's desktop and settings are configured.

There are different types of user accounts: local, roaming, and mandatory. *Local profiles* are used when you log into a local system or a network system that doesn't use network profiles.

A local profile can be saved to a network location, and then the user's network account can point to that network profile location. This is referred to as a *roaming profile*. Roaming profiles are just local profiles saved to a network location. No matter which system you log into on your network, your desktop and user profile will be the same. The profile follows the user.

To copy a local profile to the network, click the user's profile and then click the Copy To button (see Figure 1.20). Place the user's profile on a network share, and then in the Active Directory account properties for that user, point to the network profile (for example, `\\Server\ShareName\UserName`). You have now created a roaming profile.

**FIGURE 1.20** Local user profiles




To change a roaming profile to a *mandatory profile* (a profile that is mandatory), just change the name of the user profile with the extension of `.man`. So, for example, if Will Panek's roaming profile is called `NTuser.dat`, you would change it to `NTuser.man`. By adding the `.man` extension, you have made the profile mandatory. Now the user would have to use this profile when he or she logs into the network.

## Supporting Multiple-Boot Options

You may want to install Windows 10 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

dual-boot–supported operating system on your computer prior to the Windows 10 installation, you didn't upgrade from that operating system, and you installed Windows 10 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 dual-boot with Windows 7, Windows 8.1, and Windows 10.

Here are some keys to successful dual-boot configurations:

- Make sure you have plenty of disk space.
- Windows 10 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 7 and Windows 10, Windows 7 must be installed first. If you install Windows 10 first, you cannot install Windows 7 without ruining your Windows 10 configuration.
- Do not install Windows 10 on a compressed volume unless the volume was compressed using NTFS compression.

Once you have installed 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. To open a command prompt window, you can do the following:

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

Once the command-prompt window is open, type `bcdedit` to launch the **`bcdedit`** utility. You can also type **`bcdedit/?`** to see all the different `bcdedit` commands. A few `bcdedit` commands may be needed when dual-booting a machine. Table 1.6 shows some of the `bcdedit` commands that may be needed when dual-booting.

**TABLE 1.6** `Bcdedit` commands for dual-booting

| Command | Explanation |
|---|---|
| `/createstore` | Creates a new empty boot configuration data store |
| `/default` | Allows you to specify which operating system will start when the time-out expires |
| `/deletevalue` | Allows you to delete a specified element from a boot entry |

**TABLE 1.6** `Bcdedit` commands for dual-booting *(continued)*

| Command | Explanation |
|---|---|
| `/displayorder` | Shows the display order that the boot manager uses when showing the display order to the user |
| `/export` | Allows you to export the contents of the system store into a file |
| `/import` | Restores the system store by using the data file previously generated by using the `/export` option |
| `/set` | Allows you to set an entry option value |
| `/store` | Specifies the store to be used |
| `/timeout` | Specifies the amount of time used before the system boots into the default operating system |

## Using Windows Activation

Windows Activation is Microsoft's way of reducing software piracy. Unless you have a corporate license for Windows 10, you will need to perform postinstallation activation. This can be done online or through a telephone call. Windows 10 will attempt automatic activation three days after you log on to it 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 10 is activated. When the grace period runs out, the Windows Activation Wizard will automatically start (see Figure 1.21); it will walk you through the activation process. You may need to click the Change Product Key button and put in the license number that came with your Windows 10 copy.

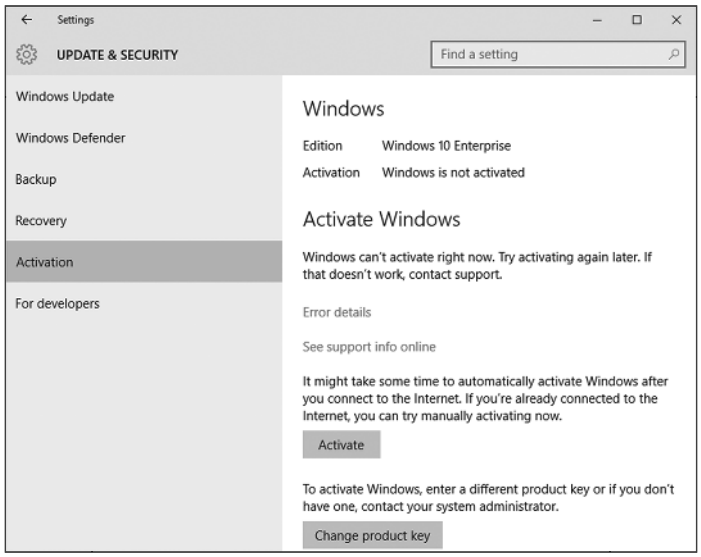
## Using Windows Update

*Windows Update* is a utility that connects to the Microsoft website and checks to ensure that you have the most up-to-date versions of Microsoft products.

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

- Critical updates
- Service packs
- Drivers

**FIGURE 1.21** The Windows Activation Wizard screen



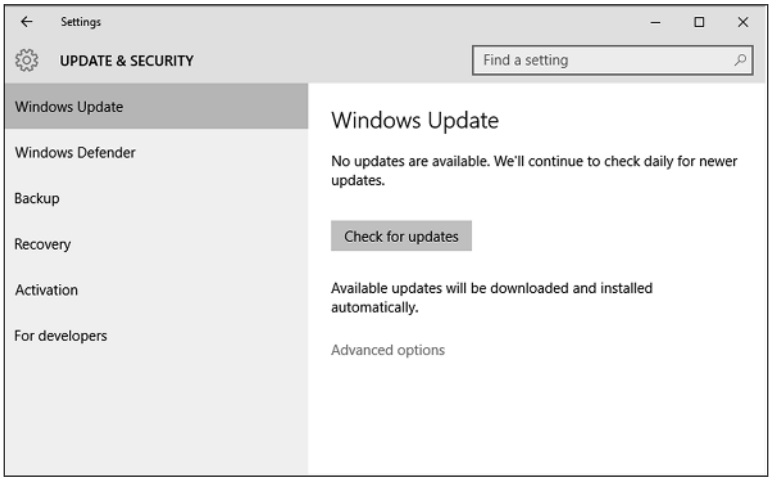

Follow these steps to configure Windows Update:

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 by clicking the Advanced Options link. The options you can access from Windows Update include the following:
   - Choose how updates are installed
   - Give me updates for other Microsoft products
   - Defer Upgrades
   - View Update History
   - Choose how updates are delivered
   - Get Insider Builds

**Check For Updates**

When you click Check For Updates, Windows Update will retrieve 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 1.22 shows the Check for Updates button.

**FIGURE 1.22** Check for updates button




There are two ways a user can receive updates: directly from Microsoft or using Microsoft Windows Server Update Service (WSUS). WSUS runs on a Windows server, and that server goes out to the Microsoft website and downloads the updates for your Windows clients. This allows client machines to receive their updates from a local server.

One advantage to using WSUS is that administrators can approve the updates before they get deployed to the client machines. Another advantage is that your clients only need to download updates locally, without using your Internet bandwidth.


WSUS is discussed in detail in *MCSA: Windows Server 2012 R2 Complete Study Guide* by William Panek (Sybex, 2015).

## Using Command-Line Options

Command-line options are becoming more and more popular among administrators and users. Windows Update has a few command-line options that can be used to help configure and maintain it. First, to start Windows Update from a command prompt, you can type **`wuapp.exe`**. Another command-line option that works with Windows Update is called Windows Update Automatic Update Client (`wuauclt.exe`), which offers the following options:

**`Detectnow`** When working with WSUS, waiting for detection to start can become very time-consuming. So Microsoft has added an option to allow you to initiate the process of

detecting available updates right away. To run the `detectnow` option, type the following command at the command prompt: **`wuauclt.exe /detectnow`**.

**`Reportnow`** This command allows you to send all queued reporting events to the server asynchronously. To execute this command, type **`wuauclt.exe /reportnow`** at the command prompt.

**`Resetauthorization`** WSUS uses a cookie on Windows 10 client computers to store different types of information. By default, an hour after the cookie is created, it expires. If you need the cookie to expire now, you can use the `resetauthorization` option along with the `detectnow` option. Using these options will expire the cookie, initiate detection, and have WSUS update computer group membership. To execute this command, type **`wuauclt.exe /resetauthorization /detectnow`** at the command prompt.

## Installing Windows Service Packs

*Service packs* are updates to the Windows 10 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.

Prior to installing a service pack, you should perform the following steps:

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

`http://windows.microsoft.com/en-US/windows/downloads/service-packs`

You can also receive service packs via Windows Update, or you can pay for a copy of a service pack to be mailed to you on disk. Before you install a service pack, you should read the release notes that are provided on the Microsoft website.

# Summary

This chapter started with a discussion of the features included with Windows 10. We also took a look at the difference between 64-bit and 32-bit operating systems and showed some of the advantages that 64-bit entails, such as greater RAM and processor speed.

Then you learned about installing Windows 10. Installation is an easy process, but you must first make sure the machine is compatible with the Windows 10 operating system.

There are two main ways to install Windows 10: upgrade or clean install. You can upgrade a Windows 7 or Windows 8 machine to Windows 10. You can migrate the user's data and information from a Windows XP machine, but there is no direct upgrade option.

After the Windows 10 installation is complete, you'll want to make sure all updates and service packs are installed. You can use Windows Update to complete that task.

# Video Resources

There are videos available for the following exercises:

1.1

1.2

You can access the videos at `www.wiley.com/go/sybextestprep` on the Other Study Tools tab.

# Exam Essentials

**Understand the Windows 10 hardware requirements.** The minimum hardware requirements to run Windows 10 properly are 1 gigahertz (GHz) or faster processor or SoC, 1 gigabyte (GB) for 32-bit or 2 GB for 64-bit of RAM, 16 GB for 32-bit OS 20 GB for 64-bit OS of hard drive space, DirectX 9 or later with WDDM 1.0 video driver, and a DVD-R/W drive or compatible network interface card.

**Understand the Hardware Compatibility List.** The Hardware Compatibility List (HCL) is an extensive list of computers and peripheral hardware devices that have been tested with the Windows 10 operating system. The hardware and supported drivers on the HCL have been put through rigorous tests to ensure their compatibility with Windows 10. Microsoft guarantees that the items on the list meet the requirements for Windows 10 and do not have any incompatibilities that could affect the stability of the operating system.

**Understand how to complete a clean install.** If your machine meets the minimum hardware requirements, you can install Windows 10. There are a few different ways to install Windows 10 onto a computer. You can use the installation disk or USB, install it over a network, or install it from an image (see Chapter 2, "Automated Windows 10 Deployments," for more details on imaging).

**Understand how to complete an upgrade.** You can't upgrade a Windows Vista machine to Windows 10. To complete an upgrade on a Windows 7 or Windows 8 machine, insert the Windows 10 DVD into the Windows machine or connect to the Windows 10 files over the network and complete an upgrade on the computer.

You can't upgrade a Windows XP machine directly to Windows 10. If the machine is running Windows XP, you have to use a migration tool to migrate all the user data from Windows XP to a Windows 10 machine.

**Understand how to migrate a user to Windows 10.** If you can't perform an upgrade on the computer, you can choose to migrate the user's files and settings from an existing installation. In this case, you can use the User State Migration Tool (USMT).

# Review Questions

1. You are the administrator in charge of a computer that runs both Windows 7 and Windows 10. Windows 10 is installed on a different partition from Windows 7. You have to make sure that the computer always starts Windows 7 by default. What action should you perform?
   - **A.** Run `Bcdedit.exe` and the `/default` parameter.
   - **B.** Run `Bcdedit.exe` and the `/bootcd` parameter.
   - **C.** Create a `Boot.ini` file in the root of the Windows 10 partition.
   - **D.** Create a `Boot.ini` file in the root of the Windows 7 partition.

2. You are the administrator for a Windows 10 computer. You have decided to use Windows Update, but you want to be able to change the settings manually. What should you do?
   - **A.** Log on to Windows 10 as a member of the Administrators group.
   - **B.** From the local Group Policy, modify the Windows Update settings.
   - **C.** Right-click Windows Update and select Run As Administrator.
   - **D.** Right-click the command prompt, select Run As Administrator, and then run `Wuapp.exe`.

3. You have two computers: System1 and System2. System1 runs the Windows 7 operating system, and System2 runs Windows 10. You need to migrate the profiles and user files from System1 to System2. You need to identify how much space is required to complete the migration. What action should you perform?
   - **A.** On System1, run `Loadstate c:\store /nocompress`.
   - **B.** On System2, run `Loadstate \\system1\store /nocompress`.
   - **C.** On System1, run `Scanstate c:\store /nocompress /p`.
   - **D.** On System2, run `Scanstate \\system1\store /nocompress /p`.

4. You are the IT manager for a medium-size organization. Your organization is looking at upgrading its Windows XP machines to Windows 10. The managers have heard of a new feature that allows you to connect a device to the machine and then the Windows 10 operating system shows a graphic of the device for use. Which Windows 10 feature are they referring to?
   - **A.** Device Manager
   - **B.** Device Stage
   - **C.** Staging Manager
   - **D.** Add/Remove Hardware

5. You are the IT manager for your organization. The organization is looking at upgrading all of its machines from Windows XP to Windows 10. Many of the managers are concerned that their Windows XP applications won't be compatible with Windows 10. Which

Windows 10 feature can you use to assure the managers that all of their Windows XP applications will continue to work?

**A.** Windows XP Compatibility Checker

**B.** Windows XP Application Center

**C.** Windows Hyper-V client

**D.** Windows XP Application Upgrade tool

**6.** You are the network administrator for a midsize company that needs to convert all of its Windows XP machines to Windows 10. How can the IT department put Windows 10 on all the Windows XP machines without losing any of the users' information?

**A.** Upgrade all the Windows XP machines to Windows 10.

**B.** Format all the XP machines and do a clean install of Windows 10.

**C.** Use a migration tool to migrate all the users' data and then load a clean copy of Windows 10.

**D.** Do nothing. The Windows XP machines can't be upgraded without losing all the users' data.

**7.** You are the IT administrator for a large computer-training company that uses laptops for all its employees. Currently the users have to connect to the wireless network through the wireless network adapter. Windows 10 now includes this built in as which feature?

**A.** Available Network Finder (ANF)

**B.** View Networks (VN)

**C.** Network Availability Viewer (NAV)

**D.** View Available Networks (VAN)

**8.** You are the network administrator for a midsize company. One of the managers has come into your office and asked you about setting up a network in his house. He wants to use Windows 10. What feature allows him to set up a home network using Windows 10?

**A.** Home Networking

**B.** HomeGroup

**C.** Quick Connect

**D.** Networking Groups

**9.** Which new Windows 10 feature allows you to quickly access files that you have been working on?

**A.** Quick Connect

**B.** Jump Lists

**C.** File Finder

**D.** Quick File Access

**10.** You are the IT manager for a pharmaceutical company. The company wants to create a medication dispenser that can be used on the floors of hospital units. The dispensers have to work through touch-screen technology. Which Windows 10 feature provides built-in touch-screen technology?

**A.** Windows Touch Screen

**B.** Windows Pure Touch

**C.** Windows Touch

**D.** Windows Pure Screen