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Exam **70-623**

MCITP

**Supporting and Troubleshooting
Applications on a Windows Vista® Client
for Consumer Support Technicians**



**CD Features Test Engine
Powered by MeasureUp!**

**David R. Miller
Paul A. Mancuso**

MCITP 70-623 Exam Cram

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Introduction

Welcome to *MCITP 70-623 Exam Cram: Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians*. Whether this book is your first or your fifteenth *Exam Cram* series book, you'll find information here that will help ensure your success as you pursue knowledge, experience, and certification. This book aims to help you get ready to take and pass the Microsoft certification Exam 70-623, "PRO: Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians." When you pass this exam, along with Exam 70-620, "TS: Windows Vista, Configuring," you will earn the Microsoft Certified Information Technology Professional (MCITP): Consumer Support Technician certification.

This Introduction explains Microsoft's certification programs in general and talks about how the *Exam Cram* series can help you prepare for Microsoft's latest certification exams. Chapters 1–5 are designed to remind you of everything you'll need to know to pass the 70-623 certification exam. The two practice exams at the end of the book should give you a reasonably accurate assessment of your knowledge—and, yes, we've provided the answers and their explanations for these practice exams. If you read the book and understand the material, you'll stand a very good chance of passing the real test.

Exam Cram books help you understand and appreciate the subjects and materials you need to know to pass Microsoft certification exams. *Exam Cram* books are aimed strictly at test preparation and review. They do not teach you everything you need to know about a subject. Instead, the authors streamline and highlight the pertinent information by presenting and dissecting the questions and problems they've discovered that you're likely to encounter on a Microsoft test.

Nevertheless, to completely prepare yourself for any Microsoft test, we recommend that you begin by taking the self-assessment that immediately follows this Introduction. The self-assessment tool helps you evaluate your knowledge base against the requirements for becoming a Microsoft Certified Technology Specialist (MCTS) and is the first step in earning more advanced certifications, including Microsoft's IT Professional and Professional Developer (MCITP and MCPD) and Architect (MCA).

Based on what you learn from the self-assessment, you might decide to begin your studies with classroom training or some background reading. On the other

hand, you might decide to pick up and read one of the many study guides available from Microsoft or third-party vendors.

We also strongly recommend that you install, configure, and play with the Microsoft Windows Vista operating system. Nothing beats hands-on experience and familiarity when it comes to understanding the questions you're likely to encounter on a certification test. Book learning is essential, but without a doubt, hands-on experience is the best teacher.

The Microsoft Certification Program

Microsoft currently offers multiple certification titles, each of which boasts its own special abbreviation. (As a certification candidate and computer professional, you must have a high tolerance for acronyms.)

Certifications for end users are listed here:

- ▶ **Microsoft Office Specialists**—Recognized for demonstrating advanced skills with Microsoft desktop software (including Microsoft Office).

These older certifications are associated with the Windows Server 2003 operating system and related network infrastructure:

- ▶ **Microsoft Certified Professional (MCP)**—For professionals who have the skills to successfully implement a Microsoft product (such as Windows XP or Windows Server 2003) or technology as part of a business solution in an organization.
- ▶ **Microsoft Certified Desktop Support Technician (MCDST)**—For professionals who have the technical and customer service skills to troubleshoot hardware and software operation issues in Microsoft Windows environments.
- ▶ **Microsoft Certified Systems Administrators (MCSAs)**—For professionals who administer network and systems environments based on the Microsoft Windows operating systems. Specializations include MCSA: Messaging and MCSA: Security.
- ▶ **Microsoft Certified Systems Engineer (MCSE)**—For professionals who design and implement an infrastructure solution that is based on the Windows operating system and Microsoft Windows Server System software. Specializations include MCSE: Messaging and MCSE: Security.

These newer certifications are based on Windows Vista and related server products:

- ▶ **Microsoft Certified Technology Specialist (MCTS)**—For professionals who target specific technologies and want to distinguish themselves by demonstrating in-depth knowledge and expertise in the various Microsoft specialized technologies. The MCTS is a replacement for the MCP program.
- ▶ **Microsoft Certified IT Professional (MCITP)**—For professionals who demonstrate comprehensive skills in planning, deploying, supporting, maintaining, and optimizing IT infrastructures. The MCITP is a replacement for the MCSA and MCSE programs.
- ▶ **Microsoft Certified Architect (MCA)**—For professionals who are identified as top industry experts in IT architecture that use multiple technologies to solve business problems and provide business metrics and measurements. Candidates for the MCA program are required to present to a review board—consisting of previously certified architects—to earn the certification.

These certifications are for database professionals:

- ▶ **Microsoft Certified Database Administrators (MCDDBAs)**—For professionals who design, implement, and administer Microsoft SQL Server databases.

These certifications are for developers and programmers:

- ▶ **Microsoft Certified Professional Developer (MCPD)**—For professionals who are recognized as expert Windows Application Developer 5, Web Application Developer 5, or Enterprise Applications Developer 5. They demonstrate that you can build rich applications that target a variety of platforms, such as the Microsoft .NET Framework 2.0.
- ▶ **Microsoft Certified Application Developers (MCADs)**—For professionals who use Microsoft technologies to develop and maintain department-level applications, components, web or desktop clients, or back-end data services.

These certifications are for trainers and curriculum developers:

- ▶ **Microsoft Certified Trainer (MCT)**—For qualified instructors who are certified by Microsoft to deliver Microsoft training courses to IT professionals and developers.
- ▶ **Microsoft Certified Learning Consultant (MCLC)**—Recognizes MCTs whose job roles have grown to include frequent consultative engagements with their customers and delivering customized learning solutions that positively affect customer return on investment (ROI).

The best place to keep tabs on all Microsoft certifications is the website www.microsoft.com/learning/default.mspx.

Microsoft changes its website often, so if this URL does not work in the future, use the Search tool on Microsoft's site to find more information on a particular certification.

Microsoft Certified Technology Specialist

Technology Specialist certifications enable professionals to target specific technologies and to distinguish themselves by demonstrating in-depth knowledge and expertise in their specialized technologies. Microsoft Technology Specialists are consistently capable of implementing, building, troubleshooting, and debugging a particular Microsoft technology.

Microsoft Certified IT Professional

The new Microsoft Certified IT Professional (MCITP) credential lets you highlight your specific area of expertise. Now you can easily distinguish yourself as an expert in database administration, database development, business intelligence, or support.

At the time of this writing, details are just starting to be revealed on the Microsoft Certified Technology Specialist (MCTS) certification on Windows Server 2008. The MCTS on Windows Server 2008 will help you and your organization take advantage of advanced server technology, with the power to increase the flexibility of your server infrastructure, save time, and reduce costs. Transition certifications are available today for Windows Server 2003 certified professionals, and full certification paths will be available soon after the Windows Server 2008 product release. For more details about these certifications, visit the website www.microsoft.com/learning/mcp/windowsserver2008/default.mspx.

If the URL is no longer available, don't forget to search for MCTS and Windows Server 2008 using the Microsoft search tool found on the Microsoft website.

Microsoft Certified Technology Specialist: Windows Vista, Configuration

The Microsoft Certified Technology Specialist certifications enable professionals to target specific technologies and distinguish themselves by demonstrating in-depth knowledge and expertise in their specialized technologies. A Microsoft Certified Technology Specialist in Windows Vista, Configuration possesses the knowledge and skills to configure Windows Vista for optimal performance on the desktop, including installing, managing, and configuring the new security, network, and application features in Windows Vista.

To earn the Microsoft Certified Information Technology Professional MCITP: Consumer Support Technician certification, you must pass two exams:

Exam 70-620, "TS: Microsoft Windows Vista Client, Configuring"
and

Exam 70-623, "IT Pro: Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians"

Exam 70-620 focuses on supporting end-user issues about network connectivity, security, and applications installation and compatibility, and logon problems that include account issues and password resets:

If you decide to take a Microsoft-recognized class, you would take two classes:

- ▶ Course 5115: "Installing and Configuring the Windows Vista Operating System" (3 days)
- ▶ Course 5116: "Configuring Windows Vista Applications and Tools" (2 days)

You can find the preparation guide (including exam objectives) for Exam 70-620, "TS: Microsoft Windows Vista, Configuring," at www.microsoft.com/learning/exams/70-620.msp.

Exam 70-623 focuses on IT professionals who typically work as Consumer Support Technicians dealing with implementing, administering, and troubleshooting Windows Vista in a standalone or home network environment.

If you decide to take a Microsoft-recognized class, you would take two classes:

- ▶ Course 5118, “Maintaining and Troubleshooting Windows Vista Computers” (3 days)
- ▶ Course 5119, “Supporting the Windows Vista Operating System and Applications” (2 days)

You can find the preparation guide (including exam objectives) for Exam 70-623, “IT Pro: Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians,” at www.microsoft.com/learning/exams/70-623.mspx.

Taking a Certification Exam

After you prepare for your exam, you need to register with a testing center. At the time of this writing, the cost to take Exam 70-623 is (U.S.) \$125; if you don’t pass, you can take each again for an additional (U.S.) \$125 for each attempt. In the United States and Canada, Thompson Prometric administers the tests. Here’s how you can contact them:

- ▶ **Prometric**—You can sign up for a test through the company’s website, at www.2test.com or www.prometric.com. Within the United States and Canada, you can register by phone at 800-755-3926. If you live outside this region, you should check the Prometric website for the appropriate phone number.

To sign up for a test, you must possess a valid credit card or contact Prometric for mailing instructions to send a check (in the United States). Only when payment is verified or a check has cleared can you actually register for a test.

To schedule an exam, call the appropriate phone number or visit the Prometric website at least one day in advance. To cancel or reschedule an exam in the United States or Canada, you must call before 3 p.m. Eastern Standard Time the day before the scheduled test time (or you might be charged, even if you don’t show up to take the test). When you want to schedule a test, have the following information ready:

- ▶ Your name, organization, and mailing address.
- ▶ Your Microsoft test ID. (In the United States, this means your Social Security number; citizens of other countries should call ahead to find out what type of identification number is required to register for a test.)
- ▶ Your Microsoft Certified Professional MCP ID, if you have one.
- ▶ The name and number of the exam you want to take.
- ▶ A method of payment. (As mentioned previously, a credit card is the most convenient method, but alternate means can be arranged in advance, if necessary.)

After you sign up for a test, you are told when and where the test is scheduled. You should arrive at least 15 minutes early. You must supply two forms of identification, one of which must be a photo ID, to be admitted into the testing room.

Tracking Certification Status

As soon as you pass your first qualified Microsoft exam and earn a professional certification, Microsoft generates a transcript that indicates which exams you have passed. You can view a copy of your transcript at any time by going to the MCP secured site at <https://partnering.one.microsoft.com> (this site might change as the MCP is retired) and selecting the Transcript tool. This tool enables you to print a copy of your current transcript and confirm your certification status.

When you pass the necessary set of exams, you are certified. Official certification is normally granted after six to eight weeks, so don't expect to get your credentials overnight. The package for official certification that arrives includes a Welcome Kit that contains a number of elements (see Microsoft's website for other benefits of specific certifications):

- ▶ A certificate that is suitable for framing, along with a wallet card and lapel pin.
- ▶ A license to use the related certification logo, which means you can use the logo in advertisements, promotions, and documents, and on letterhead, business cards, and so on. Along with the license comes a logo sheet, which includes camera-ready artwork. (Note that before you use any of the artwork, you must sign and return a licensing agreement that indicates you'll abide by its terms and conditions.)

- Access to the *Microsoft Certified Professional Magazine Online* website, which provides ongoing data about testing and certification activities, requirements, changes to the MCP program, and security-related information on Microsoft products.

Many people believe that the benefits of MCP certification go well beyond the perks that Microsoft provides to newly anointed members of this elite group. We're starting to see more job listings that request or require applicants to have Microsoft and other related certifications, and many individuals who complete Microsoft certification programs can qualify for increases in pay and responsibility. As an official recognition of hard work and broad knowledge, a certification credential is a badge of honor in many IT organizations.

About This Book

We've structured the topics in this book to build on one another. Therefore, some topics in later chapters make the most sense after you've read earlier chapters. That's why we suggest that you read this book from front to back for your initial test preparation. If you need to brush up on a topic or you have to bone up for a second try, you can use the index or table of contents to go straight to the topics and questions that you need to study. Beyond helping you prepare for the test, we think you'll find this book useful as a tightly focused reference to some of the most important aspects of Windows Vista.

Chapter Format and Conventions

Each topical *Exam Cram* chapter follows a regular structure and contains graphical cues about important or useful information. Here's the structure of a typical chapter:

- **Opening hotlists**—Each chapter begins with a list of the terms, tools, and techniques that you must learn and understand before you can be fully conversant with that chapter's subject matter. The hotlists are followed by one or two introductory paragraphs to set the stage for the rest of the chapter.
- **Topical coverage**—After the opening hotlists and introductory text, each chapter covers a series of topics related to the chapter's subject. Throughout that section, we highlight topics or concepts that are likely to appear on a test, using a special element called an alert:

EXAM ALERT

This is what an alert looks like. Normally, an alert stresses concepts, terms, software, or activities that are likely to relate to one or more certification-test questions. For that reason, we think any information in an alert is worthy of unusual attentiveness on your part.

Pay close attention to material flagged in Exam Alerts; although all the information in this book pertains to what you need to know to pass the exam, Exam Alerts contain information that is really important. You'll find what appears in the meat of each chapter to be worth knowing, too, when preparing for the test. Because this book's material is condensed, we recommend that you use this book along with other resources to achieve the maximum benefit.

In addition to the alerts, we provide tips that will help you build a better foundation for Windows Vista knowledge. Although the tip information might not be on the exam, it is certainly related and it will help you become a better-informed test taker.

TIP

This is how tips are formatted. Keep your eyes open for these, and you'll become a Windows Vista guru in no time.

NOTE

This is how notes are formatted. Notes direct your attention to important pieces of information that relate to Windows Vista and Microsoft certification.

- ▶ **Exam prep questions**—Although we talk about test questions and topics throughout the book, the section at the end of each chapter presents a series of mock test questions and explanations of both correct and incorrect answers.
- ▶ **Details and resources**—Every chapter ends with a section titled “Suggested Readings and Resources” that provides direct pointers to Microsoft and third-party resources that offer more details on the chapter's subject. In addition, that section tries to rank or at least rate the quality and thoroughness of the topic's coverage by each resource. If you

find a resource you like in that collection, you should use it, but you shouldn't feel compelled to use all the resources. On the other hand, we recommend only resources that we use on a regular basis, so none of our recommendations will be a waste of your time or money (but purchasing them all at once probably represents an expense that many network administrators and Microsoft certification candidates might find hard to justify).

The bulk of the book follows this chapter structure, but we'd like to point out a few other elements:

- ▶ “Practice Exam 1” and “Practice Exam 2” and the answer explanations provide good reviews of the material presented throughout the book to ensure that you're ready for the exam.
- ▶ The Glossary defines important terms used in this book.
- ▶ The tear-out Cram Sheet attached next to the inside front cover of this book represents a condensed and compiled collection of facts and tips that we think are essential for you to memorize before taking the test. Because you can dump this information out of your head onto a sheet of paper before taking the exam, you can master this information by brute force; you need to remember it only long enough to write it down when you walk into the testing room. You might even want to look at it in the car or in the lobby of the testing center just before you walk in to take the exam.
- ▶ The MeasureUp Practice Tests CD-ROM that comes with each *Exam Cram* and *Exam Prep* title features a powerful, state-of-the-art test engine that prepares you for the actual exam. MeasureUp Practice Tests are developed by certified IT professionals and are trusted by certification students around the world. For more information, visit www.measureup.com.

The book uses the following typographical conventions:

- ▶ Command-line strings that are meant to be typed into the computer are displayed in monospace text, such as

```
net use lpt1: \\print_server_name\printer_share_name
```
- ▶ *New terms* are introduced in italic.

Exam Topics

Table I-1 lists the skills measured by the 70-623 exam and the chapter in which the topic is discussed. Some topics are covered in multiple chapters.

TABLE I-1 MCITP 70-623 Exam Topics

Exam Topic	Chapter
Install and Upgrade Windows Vista	
Evaluate potential upgrade environments.	1
Prepare to install Windows Vista.	1
Troubleshoot and resolve installation issues.	1
Troubleshoot and resolve post-installation issues.	1
Post-Installation: Customize and Configure Settings	
Configure Sidebar.	2
Configure Windows Aero.	2
Customize and configure user accounts.	2
Evaluate user requirements, and recommend, set up, and configure appropriate applications.	2
Evaluate user's system and recommend appropriate settings to optimize performance.	2
Configure Windows Vista Security	
Configure Windows Security Center.	3
Configure firewalls.	3
Configure Windows updates.	3
Configure Windows Defender.	3
Configure parental controls.	3
Configure Internet Explorer 7.	3
Configure user account control.	3
Protect data.	3
Configure, Troubleshoot, and Repair Networking	
Configure and troubleshoot network protocols.	4
Configure and troubleshoot network services on the client.	4
Configure and troubleshoot Windows Vista by using the Network and Sharing Center.	4
Configure and troubleshoot wireless networking.	4
Troubleshoot file and print sharing.	4

(continues)

TABLE I-1 *Continued*

Exam Topic	Chapter
Install, Configure, and Troubleshoot Devices	
Connect peripherals to Windows Vista.	5
Install, configure, and troubleshoot mobile devices.	5
Install, configure, and troubleshoot digital cameras and camcorders.	5
Install, configure, and troubleshoot media devices.	5
Install, configure, and troubleshoot printers, fax machines, and copy devices.	5
Troubleshoot and Repair Windows Vista	
Diagnose a specified issue.	1–5
Repair a corrupted operating system.	5
Remove malicious software from a client system.	3

Given all the book's elements and its specialized focus, we've tried to create a tool that will help you prepare for and pass Microsoft Exam 70-623. Please share with us your feedback on the book, especially if you have ideas about how we can improve it for future test takers. Send your questions or comments about this book via email to feedback@quepublishing.com. We'll consider everything you say carefully, and we'll respond to all suggestions. For more information on this book and other *Exam Cram* titles, visit our website at www.informit.com/examcram.

Thanks for making this *Exam Cram* book a pivotal part of your certification study plan: best of luck on becoming certified.

2

CHAPTER TWO

Windows Vista Post-Installation Tasks

Terms you'll need to understand:

- ✓ Windows Sidebar
- ✓ Sidebar Gadgets
- ✓ Windows Aero
- ✓ Windows Vista–Capable PC
- ✓ Windows Vista Premium Ready
- ✓ Windows Vista Display Driver Model (WDDM)
- ✓ DirectX 9
- ✓ Pixel Shader 2.0
- ✓ Administrator
- ✓ Standard user
- ✓ Privilege elevation
- ✓ Password reset disk
- ✓ Windows Easy Transfer tool
- ✓ Disk Defragmenter
- ✓ Redundant Array of Independent Disks (RAID)
- ✓ ReadyBoost
- ✓ Windows Media Center
- ✓ Windows Media Player
- ✓ Streaming content
- ✓ Rip content
- ✓ Digital Rights Management

Techniques you'll need to master:

- ✓ Configuring the Windows Vista Sidebar with Gadgets
- ✓ Configuring Windows Vista Aero
- ✓ Configuring administrator and standard users
- ✓ Creating and using a password reset disk
- ✓ Using the Windows Easy Transfer tool
- ✓ Configuring ReadyBoost
- ✓ Performing disk defragmentation
- ✓ Optimizing Media Center
- ✓ Ripping content in Media Player

So now you've gotten Windows Vista installed. Where do you begin the next step in turning this computer into something usable? How do you configure it to "feel good," the way you want it to? That is exactly what you'll learn in this chapter on Windows Vista post-installation tasks.

After a successful installation, the Windows Vista Welcome Center appears. This introduces the user to the standard configuration areas of the computer, shown in Figure 2.1.

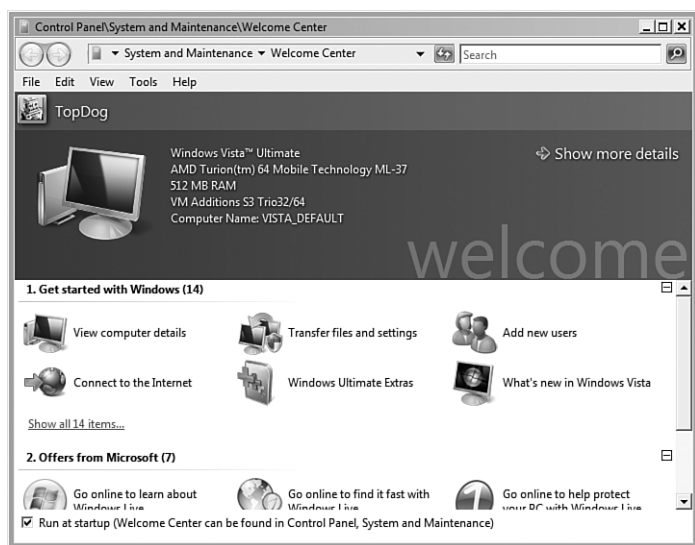


FIGURE 2.1 Windows Vista Welcome Center.

You can either minimize or close the Welcome Center, but if you want it to stop popping up with every login, you must clear the Run at Startup check box, in the lower-left corner of the Welcome Center window.

You need to know how to configure the desktop and use tools in the following areas:

- ▶ Windows Sidebar
- ▶ Windows Aero
- ▶ Administrator accounts and standard user accounts
- ▶ Windows Easy Transfer
- ▶ Application installation and configuration
- ▶ Performance improvement in Windows Vista

- ▶ Media Center
- ▶ Media Player

Windows Sidebar

Windows Sidebar, a new feature in Windows Vista, is a glasslike desktop enhancement that acts as an anchor for useful applications called Gadgets.

Enable Sidebar by selecting Start, All Programs, Accessories, Windows Sidebar, as shown in Figure 2.2.

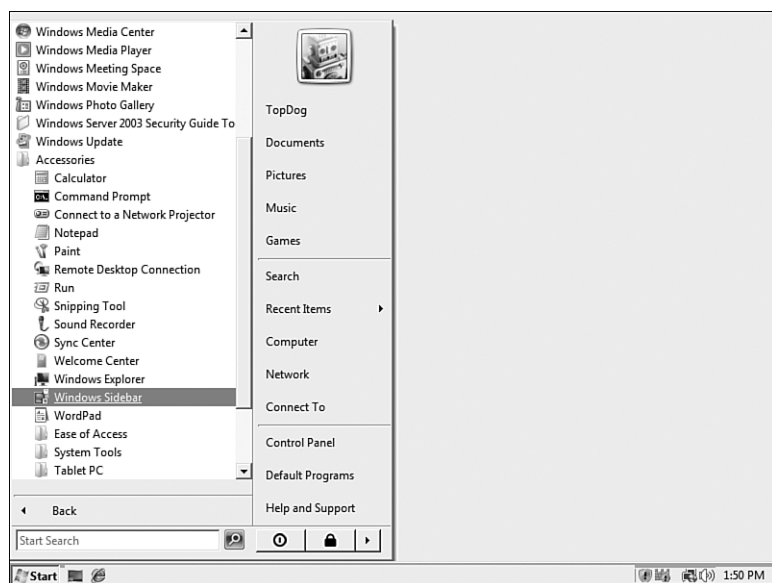


FIGURE 2.2 Enabling Windows Sidebar.

By default, Vista loads the clock, the slideshow picture viewer, and the RSS feed headlines monitor, as shown in Figure 2.3.

You can configure a few properties of Windows Sidebar by right-clicking Sidebar and selecting Properties. This brings up the dialog box shown in Figure 2.4.



FIGURE 2.3 Default Gadgets on Windows Sidebar.

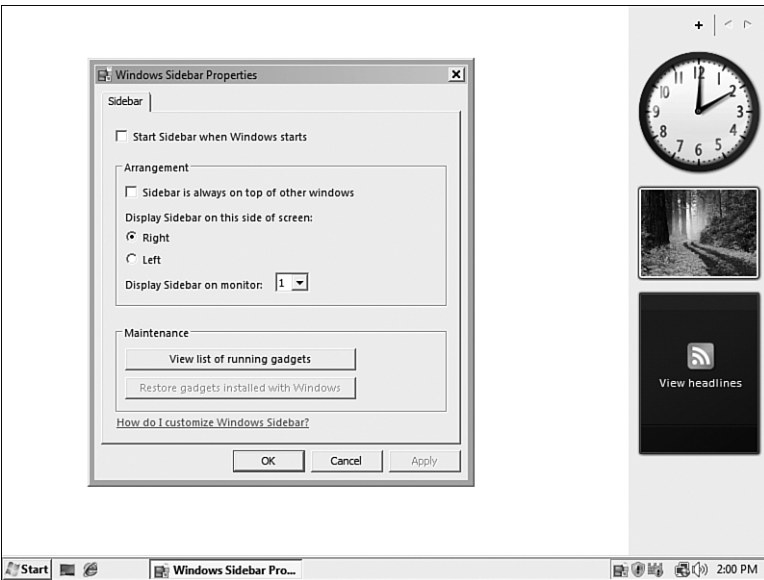


FIGURE 2.4 Configuring Windows Sidebar.

EXAM ALERT

If you want Sidebar to be on the desktop with every login, enable the **Start Sidebar When Windows Starts** check box. As you can see, you can keep Sidebar on top of all other windows, place Sidebar on the right or left side of your display, specify which monitor to display Sidebar on if you have multiple display monitors, view all running Gadgets, and reinstall the default Gadgets, just in case they've gone missing. Click the **OK** button when you've finished configuring the Sidebar properties.

You'll also notice that Sidebar places an icon in the system tray in the lower-right corner of your desktop. You can access the Sidebar menu by right-clicking this icon in the system tray.

The default installation of Windows Vista includes about a dozen Gadgets:

- ▶ Calendar
- ▶ Clock
- ▶ Contacts
- ▶ CPU Meter
- ▶ Currency converter
- ▶ Really Simple Syndication (RSS) Feed Headlines
- ▶ Notes
- ▶ Picture Puzzle
- ▶ Slideshow picture viewer
- ▶ Stocks
- ▶ Weather monitor

You can access these Gadgets by right-clicking Sidebar and selecting **Add Gadgets**. This brings up the **Gadget Gallery**, as shown in Figure 2.5.

EXAM ALERT

To add a new Gadget to Sidebar, simply right-click the desired Gadget in the **Gadget Gallery** and select **Add**, as shown in Figure 2.6.



FIGURE 2.5 The Gadget Gallery.



FIGURE 2.6 Adding a Gadget to Sidebar.

TIP

Selecting the Uninstall option shown in Figure 2.6 removes the Gadget software from the computer. This is usually done when creating the bastion host computer, which is a hardened operating system with all nonessential software removed, nonessential services stopped and locked down, and nonessential user accounts removed.

You can reinstall the Gadget software by selecting the Restore Gadgets Installed with Windows option in Sidebar Properties, shown earlier.

By selecting the Get More Gadgets Online hyperlink or the www.gallery.microsoft.com hyperlink in the lower-right corner of the Gadget Gallery, you can access and download a large number of Microsoft and third-party Gadgets. The files you download will have a .gadget extension and must be installed into the Gadget Gallery to be available for addition to Windows Sidebar.

CAUTION

Many different developers have written these Gadgets, which are programs that will run on your computer. Install Gadgets only from developers you trust. If the developer of the Gadget is a bad guy, the Gadget could be used to access your computer's files, show you objectionable content, change the computer's behavior at any time, or perform any number of malicious actions.

After the gadget is installed on the computer and added to Windows Sidebar, when you place the mouse pointer over the Gadget on Sidebar, you'll notice a small rectangular menu appear, as shown beside the Clock Gadget in Figure 2.7.

This menu provides access to controls to close the Gadget using the X at the top, or to access the properties of the Gadget using the wrench. Selecting the wrench on the Clock Gadget gives you a custom properties page, as shown in Figure 2.8.

Because Gadgets do many different things and are written by many different developers, these properties dialogs differ greatly.

Some Gadgets can be adjusted relative to their level of opacity. Because these are always on the desktop, Microsoft figured it was a good idea to give them different levels of opacity, in case you want to see what is behind the Gadget.

You can also detach Gadgets from Sidebar and place them anywhere on the desktop. Simply drag and drop them wherever you want them placed; you can also do this from the Gadget's right-click menu.



FIGURE 2.7 The Gadget menu.



FIGURE 2.8 The Clock Gadget properties.

If you remove a Gadget from Sidebar, it is still available from the Gadget Gallery and can be added back to Sidebar.

Finally, using the plus sign (+) and the right arrow at the top of Sidebar, you can add multiple Sidebars with different combinations of Gadgets and then rotate Sidebar to present the desired Sidebar face.

Windows Aero

Windows Aero is a new feature of Windows Vista that is getting a lot of attention. It is a collection of visual enhancements designed to make your computing experience more enjoyable and visually stimulating and make it easier to navigate among many different applications and windows.

EXAM ALERT

Windows Aero requires a certain level of performance on the computer hardware and video drivers itself and is not available on the Windows Vista Home Basic version.

The minimum hardware and driver requirements to support Windows Aero are as follows. You must know these specifications for the exam:

- ▶ 1GHz 32-bit or 64-bit processor
- ▶ 1GB RAM
- ▶ Video graphics adapter with a minimum of 128MB video RAM
- ▶ DirectX 9-class graphics processor
- ▶ Windows Display Driver Model (WDDM)-compatible driver
- ▶ Pixel Shader 2.0 in hardware
- ▶ 32-bit color depth

You might get Aero functionality with a little slower CPU, a little less RAM, and a little less video RAM. You might need to set the video refresh rate to a setting greater than 10Hz. (Finding a monitor that does less than 60Hz is a difficult task—a refresh rate greater than 10Hz is still the published specification.)

If you expect to be able to run Windows Aero, and it is not available as an option in Appearance Settings, make sure that you meet this minimum hardware specification to run Aero.

Windows Aero provides these special features:

- ▶ **Glass**—This gives an artsy visual look and feel to windows.
- ▶ **Taskbar thumbnails**—Hover over the buttons on the Taskbar to get a thumbnail view of the application.

- ▶ **Windows Flip**—Alt+Tab—Quickly page through all open windows to make finding your desired application easier.
- ▶ **Windows Flip 3D**—Windows logo button+Tab—Scroll through a 3D version of Alt+Tab.

Figure 2.9 shows the Windows Vista Basic visual experience, with no glass.

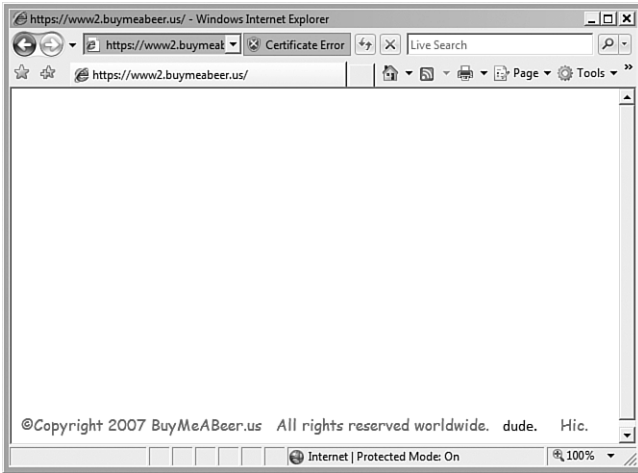


FIGURE 2.9 Windows Vista without Aero.

Figure 2.10 shows the Windows Vista Aero visual experience, with glass.



FIGURE 2.10 Windows Vista with Aero.

To enable Windows Vista Aero, right-click the desktop and select Personalize from the menu. Click the Window Color and Appearance hyperlink. If your system *does not* support Windows Vista Aero, the window presented is labeled as Appearance Settings, as shown in Figure 2.11.

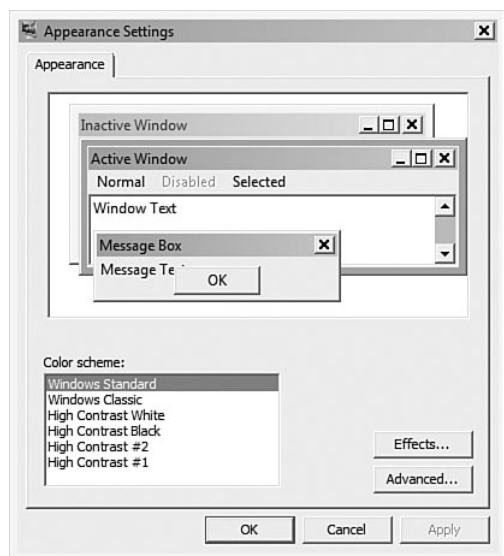


FIGURE 2.11 A system that does not support Windows Vista Aero.

Notice that in the Color Scheme selection list, only the Windows Standard and Windows Classic options are listed; a Windows Aero option is absent.

If your system *does* support Windows Vista Aero, notice that in the Color Scheme selection list, not only are Windows Standard and Windows Classic options listed, but so are the Windows Aero and Windows Vista Basic options, as shown in Figure 2.12. Select the Windows Aero option to enable Windows Aero.

After about 30 seconds of driver exchanges and configuration parameter updates in the Registry, your screen converts to the Windows Aero display and returns you to the Personalize window. Now if you click the Window Color and Appearance hyperlink, you see the Window Color and Appearance window, shown in Figure 2.13.

In the Window Color and Appearance window, you can configure the window border color, enable and adjust the transparency level, or click the Open Classic Appearance Properties for More Color Options hyperlink. This hyperlink opens the Appearance window, where you can change to the Windows Aero color scheme.

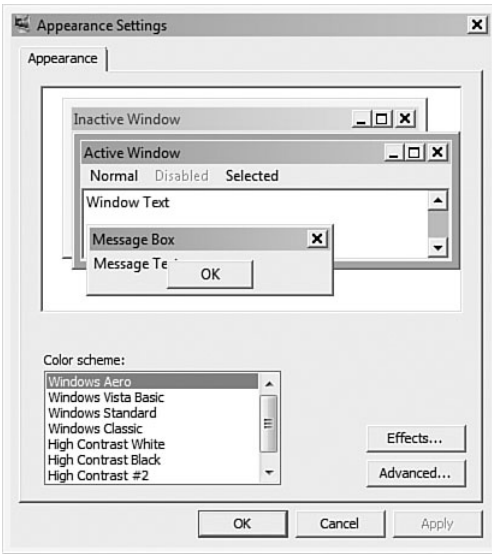


FIGURE 2.12 A system that supports Windows Vista Aero.

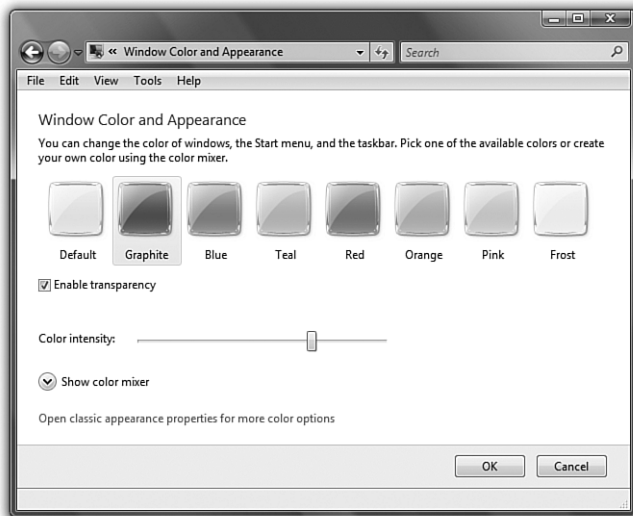


FIGURE 2.13 Configuring the Window Color and Appearance settings.

Taskbar Thumbnails

Without Aero enabled, as you hover your mouse over a Taskbar button, you get a ToolTip, which is a text description of the application. Figure 2.14 shows the Windows Vista Aero Taskbar Thumbnails.

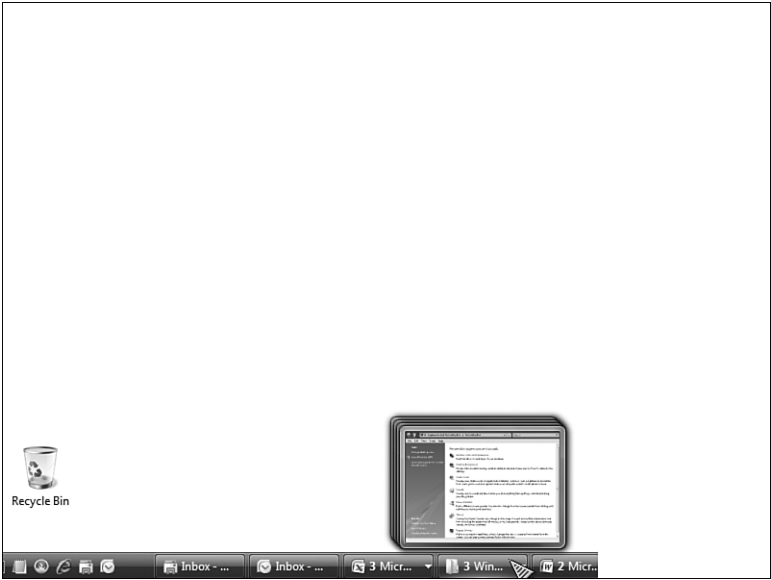


FIGURE 2.14 Windows Vista Aero Taskbar Thumbnails.

Without Aero enabled, when you hold down the Alt key and press Tab, you get a flat dialog with 2D icons (see Figure 2.15) that shows the applications that are running.



FIGURE 2.15 Without Windows Vista Aero—Alt+Tab fast task switching.

Windows Flip

With Windows Vista Aero enabled and using Alt+Tab fast task switching, you get a cool display of each document and application that is running in the glass window, as shown in Figure 2.16.



FIGURE 2.16 With Windows Vista Aero—Alt+Tab fast task switching, called Windows Flip.

Windows Flip 3D

Without Aero enabled, when you hold down the Windows key and press Tab, you get absolutely nothing. With Windows Vista Aero enabled, when you hold down the Windows key plus Tab, you get each document and application in the glass window on a 3D rolodex called Windows Flip 3D, as shown in Figure 2.17.

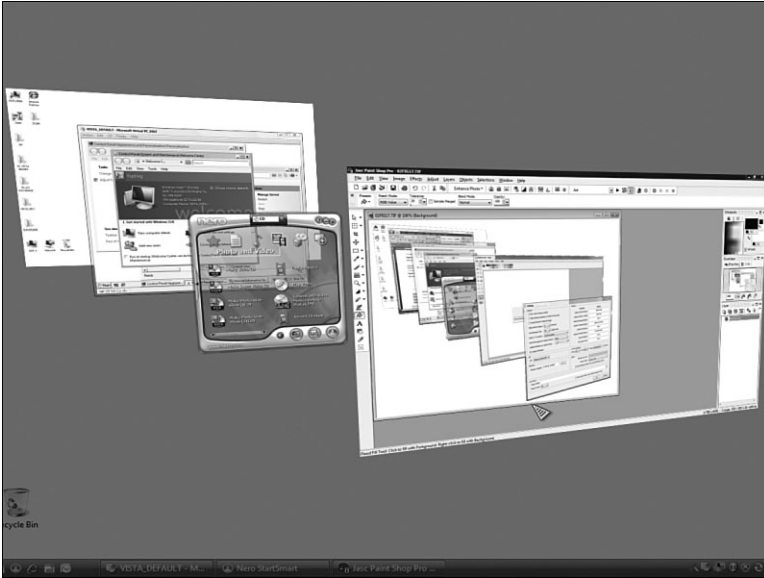


FIGURE 2.17 With Windows Vista Aero—Win+Tab fast task switching, called Windows Flip 3D.

User Accounts: Standard User Versus Administrator User

Windows Vista provides two main types of user accounts:

- ▶ Administrator accounts for users who require full access to the computer
- ▶ Standard user accounts for those users who need to run applications but who should be limited or restricted in their administrative access to the computer

When Windows Vista is installed, three user accounts are created by default: the administrator, the initial user, and a Guest account. Of these, the administrator and Guest accounts remain in a disabled state. The initial user account is the one that you used to perform the installation.

EXAM ALERT

You should default to creating a separate standard user account for every user of the computer, including administrators, and require passwords for each account. This enables you to control which programs, games, and websites each user can use and install. You should create a second account, an administrator account, for each administrator on the computer. Administrators should always log in using their standard user account and then use the Run As Administrator function (right-click the application or shortcut) to provide their administrator credentials only when they need elevated privilege.

For security and control purposes, you should create administrator user accounts only when absolutely necessary.

You should know the process for creating user accounts and setting a password for the account.

Creating Users

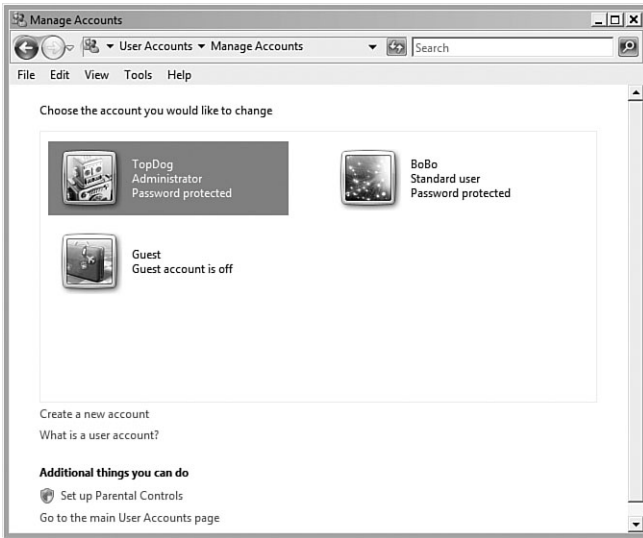
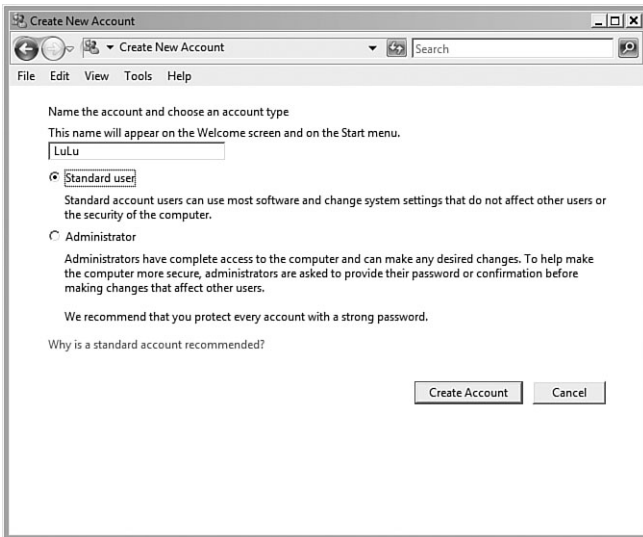
Only an administrator can create a user. This is accomplished in Control Panel, User Accounts and Family Safety, Add or Remove User Accounts. Vista's new User Account Control (UAC) prompts you for administrative approval.

Select the Create a New Account hyperlink in the lower-left corner (see Figure 2.18).

You must enter the name of the new user. As you can see in Figure 2.19, the default and recommended user type is the standard user.

It is further recommended that every user account have a strong password. A password is not a default part of creating user accounts; you must perform this task separately. Click the Create User button to complete the creation process.

After the user account is created, you are returned to the Manage Accounts window. Notice that the new user (LuLu, in our case) is not password protected as with the other user accounts. To establish a password for this account, click the new account in the Manage Accounts window, shown in Figure 2.20.

**FIGURE 2.18** Managing accounts.**FIGURE 2.19** Creating a new user.

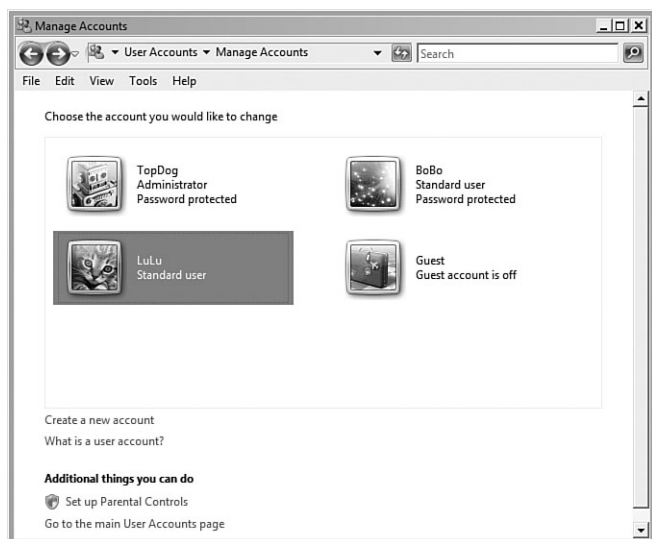


FIGURE 2.20 Changing an account.

Next select the [Create a Password](#) hyperlink, as shown in Figure 2.21.

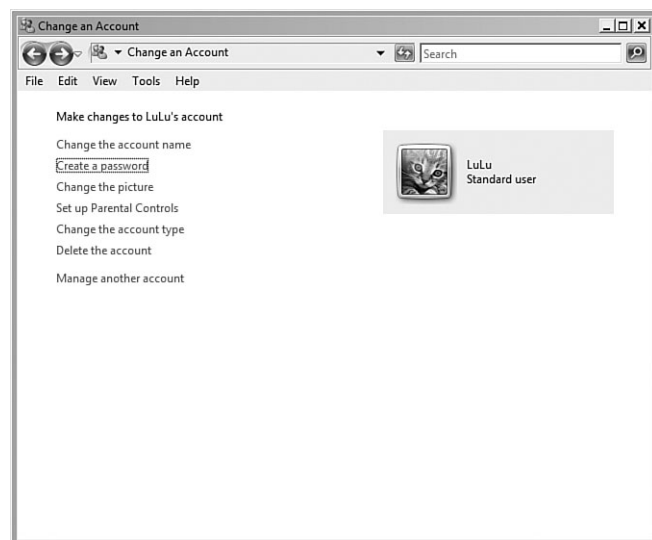


FIGURE 2.21 Create a password.

Now you must type the user's password twice, as shown in Figure 2.22.

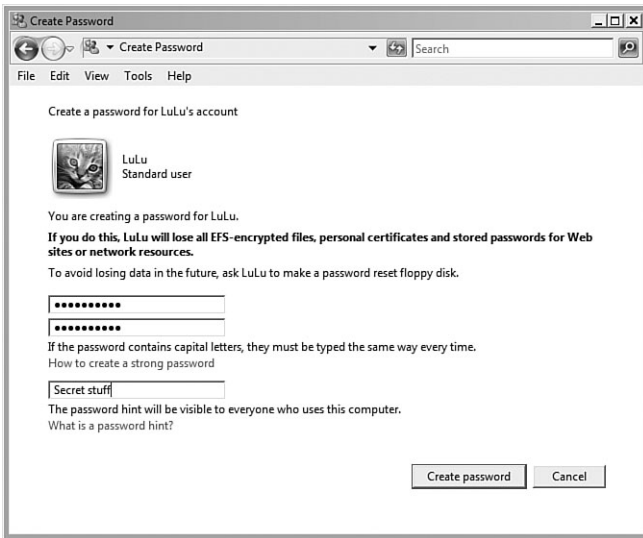


FIGURE 2.22 Entering the password, and possibly a password hint.

You may also type in a password hint. This is presented to the user if the user enters the wrong password while trying to log on. *Do not type the password in the password hint field.* Click the Create Password button when you are done. Select the Manage Another Account hyperlink to return to the Manage Accounts window. Notice that the new LuLu account is now password protected.

NOTE

Notice in Figure 2.22 that you are advised to create a Password Reset Disk. This disk is usable only on local accounts, not domain accounts, and can be made on any removable medium, such as a floppy disk or a USB thumb drive. This process is initiated by pressing and holding the Ctrl and Alt buttons and then striking the Del button on the keyboard. From the resulting menu, select to create a Password Reset Disk and follow the instructions.

The Password Reset Disk can also be created on the User Accounts page. Select the Create a Password Reset Disk option in the left navigation bar.

What Can the Standard User Do?

In Windows XP, the non-administrator user could do many things, including these:

- ▶ Modify most of the Display settings (not adjusting the font size)
- ▶ Run most installed applications (not configuration related)

- ▶ Connect to wireless networks, including Bluetooth and Infra-red (Ir) connections
- ▶ Burn CDs and DVDs
- ▶ Copy files to network shares, where permissions allow

Windows Vista includes these capabilities for the standard user and has increased what the standard user can do. These new privileges for the standard user in Windows Vista are relatively common, low-risk tasks. These new permissions for standard user accounts in Windows Vista were not available to non-administrator users in Windows XP:

- ▶ View system clock and calendar
- ▶ Change time zone (not the time, though)
- ▶ Change power-management settings
- ▶ Enable and configure Windows Sidebar
- ▶ Install critical Windows Updates
- ▶ Install ActiveX controls from websites approved by an IT administrator
- ▶ Add printers and other devices that have the required drivers installed on the computer or that have been allowed by an IT administrator in Group Policy
- ▶ Create and configure a virtual private network connection
- ▶ Install wireless security, including WEP, WPA, and WPA2 to connect to secure wireless networks

In Windows Vista, by default, standard users are prohibited from installing most programs and drivers, changing system settings, and performing other administrative tasks.

NOTE

The properties and capabilities of the standard user described in this book are those defined by default. An administrator on the computer can decrease or increase these properties and capabilities.

How Can I Tell What the Administrator Can Do?

The administrator user can perform any configuration task on the computer. The only entity on the computer that is more powerful than the administrator is the kernel of the operating system, affectionately personified and referred to as “the kernel.” The kernel may disallow administrator actions, such as deleting the system or boot partitions.

Administrator privilege is required to perform most configuration changes on the computer:

- ▶ Install applications
- ▶ Add and remove user accounts
- ▶ Change settings on the firewall (required when enabling file and printer sharing, media sharing, and remote desktop administration)
- ▶ Configure Parental Controls
- ▶ Change media rating restrictions
- ▶ Back up and restore files to the computer
- ▶ Change visual effects that impact system performance

EXAM ALERT

Tasks that require administrator privilege, such as **Allow a Program Through Windows Firewall** or **Add or Remove User Accounts**, identify themselves with a shield icon in the graphical user interface, as shown in Figure 2.23.

Many more tasks require administrative privilege. Spend 5 or 10 minutes poking around on the configuration dialogs, and look for the shield icon to get a feel for which tasks require administrative privilege.

Running processes as an administrator presents a greater attack surface to the bad guys and malware. To minimize this potential exposure, when you use an administrator account on a Windows Vista computer, User Account Control (UAC), covered in Chapter 3, “Managing Windows Vista Security,” increases

the security of the computer. Even when you are logged on as an administrator, most programs are executed with the permissions of a standard user. This limits the computer's attack surface to malware that could be executed through those programs by running applications as a standard user. If the application or task requires greater privilege than the standard user, UAC prompts for administrator credentials or administrator approval.

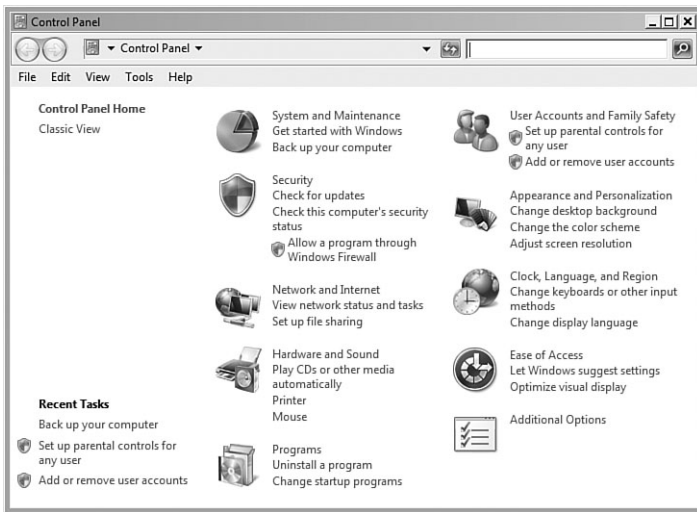


FIGURE 2.23 Administrative credentials are required for tasks with the shield icon.

NOTE

Windows Vista has increased the security of the system by implementing several mechanisms that further reduce the attack surface. These new security enhancements include the following:

- ▶ File system and Registry virtualization
- ▶ Over-the-shoulder (OTS) credentials
- ▶ Admin Approval Mode
- ▶ Elimination of the Power Users group
- ▶ Application manifest

These new security components are currently beyond the scope of the exam but might be added to the exam pool over time.

EXAM ALERT

Because an administrator user can make any configuration change on the computer, even if you implemented restrictions for another administrator user, an administrator could simply reverse your settings and remove the restrictions. If you want to restrict users from making configuration changes or implement parental controls, software restrictions, Internet explorer restrictions, and so on, you must make those users standard users.

If you intend to control different users differently, you must password-protect those standard user accounts. Otherwise, the standard users can log on as any of the other standard users.

EXAM ALERT

On the exam, if a user requires the capability to perform some administrator task, you must look for one of two things:

1. If the answer set includes an explicit user rights assignment that will satisfy the required task(s), pick this. This is a more secure setting than making the user an administrator and is the better answer.
2. If the answer set does not provide the appropriate discrete user rights assignment to accomplish the required task(s), you must create the user as an administrator to provide sufficient privilege. Select this only when the required user rights assignment choice is not present in the answer set because it opens the computer, the user, and the user's sessions and data to increased vulnerability.

NOTE

User rights assignments are configured in the Local Computer Policy (LCP) on a stand-alone or home computer. They can also be configured in a Group Policy Object (GPO) if the computer is participating in an Active Directory (AD) environment. Configuring the LCP is covered in Chapter 3. Configuring GPOs is out of the scope of this exam and is not addressed in this book.

Configuring Applications for Users

As a technical specialist in the consumer world, you might be faced with having to make adjustments to a computer for applications to work. Applications can fail for several different reasons, so you must be familiar with a few different angles on providing solutions.

Administrative tasks generally deal with configuring the operating system and hardware to function properly. This section covers troubleshooting third-party applications that the end users need to run—programs such as accounting software, image-editing applications, and customer relations–management software.

To address this type of issue, Microsoft has produced several new features and tools.

The Program Compatibility Assistant

The Program Compatibility Assistant is an automatically installed feature of Windows Vista that runs when it detects an older program that is having a compatibility problem. The Program Compatibility Assistant initializes and runs in the background. The user cannot initiate or configure it. The Program Compatibility Assistant tries to automatically adjust the operating system to accommodate the application's needs, as long as it doesn't violate the system's integrity or security.

The Program Compatibility Wizard

The Program Compatibility Wizard is a tool you can run manually on a program if you notice compatibility issues. You access the Program Compatibility Wizard through Control Panel, Programs, Use an Older Program with This Version of Windows.

This launches the wizard, as shown in Figure 2.24.



FIGURE 2.24 The Program Compatibility Wizard.

EXAM ALERT

Do not run the Program Compatibility Wizard on older antivirus programs, disk utilities, or other system programs because it can cause data loss or create a security risk. These older utilities should not be used on a computer that runs Vista; use only utilities that are specifically designed and approved to work with Windows Vista.

The Program Compatibility Wizard walks you through selecting the legacy application of interest. You then select the version of Windows that it was written for so Vista can spoof or impersonate that version of the operating system, configure the required display settings, select the Run with Administrator Privilege setting (if required), and then test the application with the selected settings. If all is good, you can save those settings so Windows Vista will always use them to launch the legacy application.

The Compatibility Tab

Another angle on legacy application compatibility is the Compatibility tab on the properties of the older application. Notice in Figure 2.25 that the configuration settings are those of the Program Compatibility Wizard.

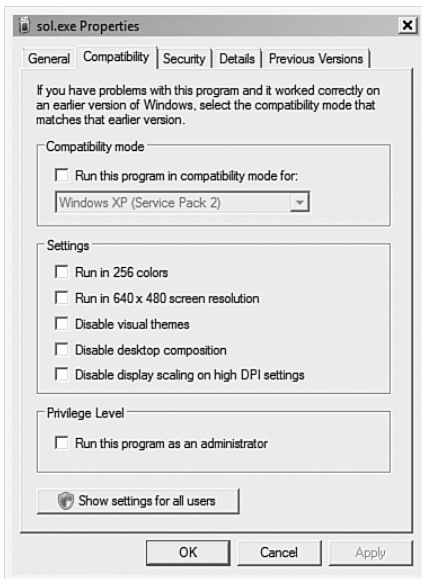


FIGURE 2.25 The Compatibility tab on a legacy executable.

The Compatibility Mode setting enables you to select the legacy version of Windows that the legacy application is written for.

The Settings section enables you to configure display parameters that might be more suitable for the legacy application.

The Privilege Level setting enables you to run the legacy application with an elevated privilege level, that of the administrator.

NOTE

The settings in the Compatibility tab are not available for applications that are compatible with Windows Vista.

The Application Compatibility Toolkit v5

The next target of interest regarding application compatibility is the Application Compatibility Toolkit v5. This is a free download from the Microsoft website. With it, you can do the following:

- ▶ Analyze your portfolio of applications, websites, and computers
- ▶ Evaluate operating system deployments, the impact of operating system updates, and your compatibility with websites
- ▶ Centrally manage compatibility evaluators and configuration settings
- ▶ Rationalize and organize applications, websites, and computers
- ▶ Prioritize application compatibility efforts with filtered reporting
- ▶ Add and manage issues and solutions for your enterprise-computing environment
- ▶ Deploy automated mitigations to known compatibility issues
- ▶ Send and receive compatibility information from the Microsoft Compatibility Exchange

The Application Compatibility Toolkit uses compatibility evaluators to analyze information about the application in question. It includes a Setup Analysis Tool, an Internet Explorer Test Tool, and a Standard User Analyzer Tool to analyze how the program behaves when being installed and run by users.

Privilege Level

Remember that standard users cannot install most applications, so an administrator likely will need to perform the installation. After installation, typically a standard user will be running the application. Some applications, especially legacy applications, were written before there was much concern for security, and the operating system files were wide open with permissions and available for anyone to access. The programmers writing the applications understood and relied on that free access when they wrote their programs. Now that we have evolved into a more security-minded society, our operating system files are locked down with tightly configured permissions, especially in Windows Vista. This is the cause of many application failures in Windows Vista.

One of the first types of problems you will encounter is the application that requires more access to more files and locations. The user can right-click the application's executable file, or its shortcut, and select the Run as Administrator option (see Figure 2.26).

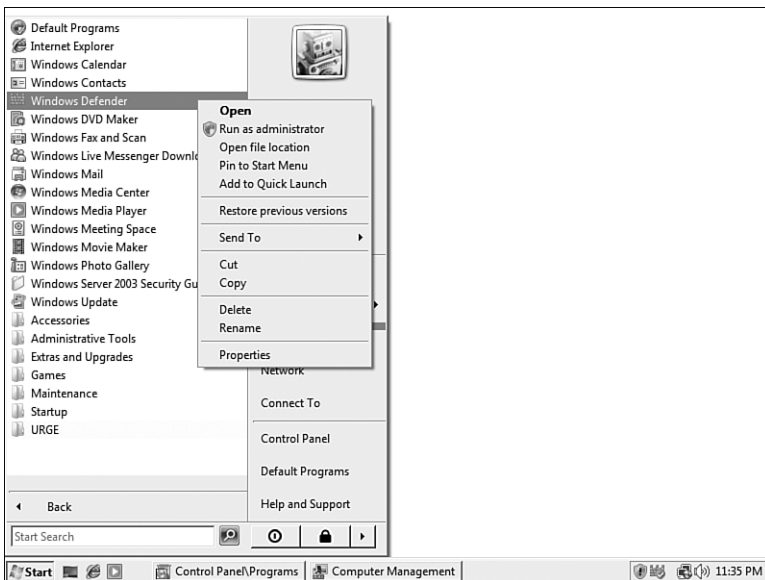


FIGURE 2.26 Use the Run as Administrator option to elevate privilege.

Selecting this option triggers User Account Control (UAC) to prompt the user to provide administrator credentials if the user is logged on as a standard user, or it prompts the user for confirmation if the user is logged on as an administrator.

EXAM ALERT

Requiring users to log on as standard users and then use the Run as Administrator option is more secure than having users log on as an administrator every time. This process elevates the privilege level of only the one application instead of the privilege level of the entire desktop and all applications the user is running.

Bad Installation

Occasionally, even fully compatible and well-written applications don't install properly on the first attempt. If an application is compatible with Windows Vista and your computer meets all hardware specifications for the application, yet it fails to run properly, you might simply need to uninstall and reinstall the application. This knowledge is from real-world experience, and it may be test worthy.

64-Bit and 32-Bit CPUs

For the last two decades, the vast majority of all CPUs were 32-bit CPUs. The 64-bit CPUs are the next generation of computing and are now more common than ever. These 64-bit CPUs provide increased performance, reliability, and security.

Microsoft has produced a 32-bit version and a 64-bit version of Windows Vista. This is another potential wrinkle in getting applications to operate properly on Windows Vista.

CAUTION

The 64-bit version of Vista requires a 64-bit CPU. In addition, all drivers must be 64-bit drivers and must be Vista compatible, and all applications must be 64 bit compatible (not 64 bit, just 64 bit compatible). Pulling this all together isn't necessarily an easy project. Many device manufacturers still don't have 64-bit drivers available for their devices. Many 32-bit applications fail to run properly on a 64-bit operating system.

EXAM ALERT

If your CPU is a 32-bit CPU, you can install only the 32-bit version of Windows Vista and run only 32-bit applications on that computer.

If your CPU is a 64-bit CPU, you can install either the 32-bit version or the 64-bit version of Windows Vista.

If you install the 32-bit version of Vista, you can run only 32-bit applications on that computer.

If you install the 64-bit version of Vista, you can run only 64-bit applications or 64-bit-compatible applications on that computer.

Permissions Settings

Permissions have always been a target for the Microsoft Certification exams. Let's run through a quick review of how permissions work.

You basically have six functional permissions:

- ▶ **R**—Read, the capability to read the contents of a file
- ▶ **W**—Write, the capability to write the contents of a file
- ▶ **X**—Execute, the capability to run programs
- ▶ **D**—Delete, the capability to delete a file
- ▶ **P**—Permissions, the capability to change permissions on a file or folder
- ▶ **O**—Ownership, the capability to take or assign ownership of a file or folder

These permissions are combined into practical combinations and can be assigned in two possible places:

- ▶ **On the NTFS partition at the resource**—Managed by the NTFS file system
- ▶ **At the share point**—Managed by the Server service (file and printer sharing)

See Figure 2.27 and Table 2.1 for NTFS permissions that can be granted at the folder and file levels.

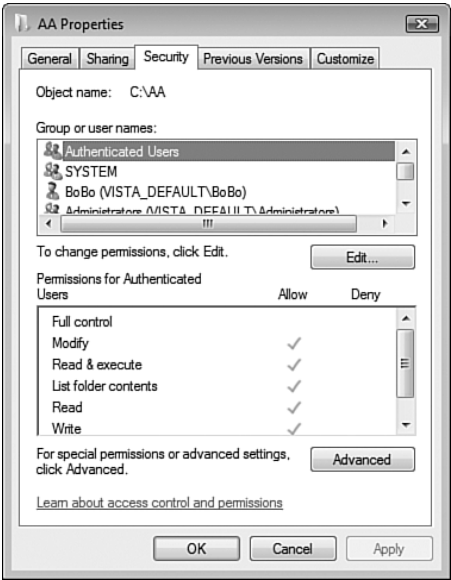


FIGURE 2.27 NTFS permissions are located on the Security tab of the folder or file’s properties.

TABLE 2.1 NTFS Permissions Overview

NTFS Permissions	Functional Equivalent
Full Control	R W X D P O
Modify	R W X D
Read & Execute	R X
List folder contents*	R X
Read	R
Write	W
Special Permissions	Any custom combination of permissions

*Available only on NTFS folders (not files). This permission also requires X on the executable file to run a program.

Also notice in Figure 2.27 that there are Allow permissions and Deny permissions. Deny permissions are all powerful and dominate 100 percent of Allow permissions that may be granted directly to the user or through group memberships.

Only folders can be shared. You cannot share a discrete file. Share permissions are located on the Sharing tab of the shared folder’s properties. Then click the Advanced Sharing button, enable the Share This Folder option, and select Permissions. Figure 2.28 shows the permissions that can be granted on a shared folder and are described further in Table 2.2.

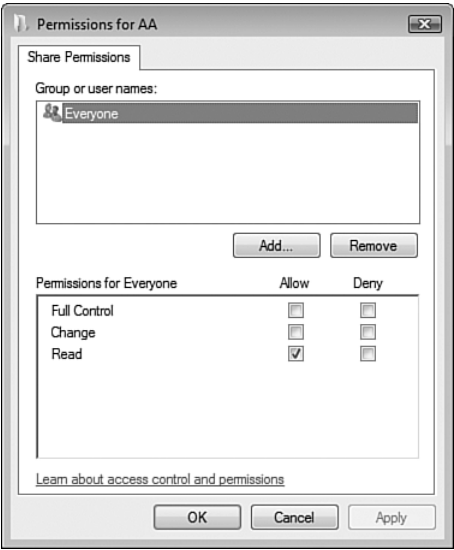


FIGURE 2.28 Share permissions.

TABLE 2.2 Share Permissions Overview

Share Permissions	Functional Equivalent
Full Control	R W X D P O
Change	R W X D
Read	R X

EXAM ALERT

Notice that, in both cases, only the Full Control permission allows you to change the Permissions (P) and the Ownership (O) of the folder or file.

To calculate effective permissions, you must understand whether the user is a member of the Interactive Users group, where only NTFS permissions apply, or a member of the Network users group, where both Share and NTFS permissions apply.

Determining Effective Permissions for the Interactive User

If you sit down at the computer where the files and folder are, you are subject to only the NTFS permissions as you try to access the files on the NTFS partition. In this case, you are a member of the Interactive group.

As a member of the Interactive group, your user account and all the groups that you are a member of (including the Interactive group) get compared to the Access Control List (ACL) on the file or folder you are accessing, where you might be granted different combinations of Allow permissions and Deny permissions. Remember that the Deny permissions overrule any Allow permissions.

First you add up all the Allow permissions. Then you subtract any Deny permissions. The permissions that remain are your effective NTFS permissions; they define your access level when you are a member of the Interactive group.

Look at the following example of determining the effective permissions for an Interactive user. User1 is a member of the Managers group, the Production group, and the Bad Boys group. Because he is an interactive user, only NTFS permissions apply to his access.

	<u>File1.txt (NTFS)</u>	<u>Functional Equivalent</u>
User 1	No permissions set	=
Managers	Allow Modify	= R W X D
Production	Allow Read	= R X
Bad Boys	Deny W, D	= <u>-W -D</u>
		Allow = R W X D
		Deny = <u>-W -D</u>
		Effective = R X

Determining Effective Permissions for the Network User

If you access files and folders over the network, on a remote computer, your access requests must first pass through the share point, being subject to the permissions that are managed by the Server service. Then you must still access the files and folders on the NTFS partition. So you are subject to both share permissions and NTFS permissions combined. In this case you are a member of the Network group.

EXAM ALERT

First you must pass through the share point, so you add up all the Allow permissions at the share point.

Next, you subtract any Deny permissions at the share point.

The permissions that remain are your effective share permissions.

Then you must access the file on the NTFS partition, so you add up all the NTFS Allow permissions on the file.

Next, you subtract any NTFS Deny permissions on the file.

The permissions that remain are your effective NTFS permissions.

Now you have a share permissions list and an NTFS permissions list. Whatever permissions the two lists have in common (often referred to as the most restrictive combination) are your effective network access permissions for the target file.

Look at the following example of determining the effective permissions for a Network user. User1 is a member of the Managers group, the Production group, and the Bad Boys group. Because he is a Network user, both share and NTFS permissions apply to his access.

	<u>Share Permissions</u>	<u>Functional Equivalent</u>
User 1	Full Control	= R W X D P O
Managers	Modify	= R W X D
Production	No permissions set	=
Bad Boys	Deny nothing	=_____.

Allow = R W X D P O

Deny =_____.

Effective Share = R W X D P O

	<u>File1.txt (NTFS)</u>	<u>Functional Equivalent</u>
User 1	No permissions set	=
Managers	Change	= R W X D
Production	Read	= R X
Bad Boys	Deny W, D	= <u>-W -D</u>

Allow = R W X D

Deny = -W -D

Effective NTFS = R X

User1's effective permissions as a network user are what the two lists, Share permissions and NTFS permissions, have in common. User1 is allowed to Read folder content and Read and Execute files. That's it. All other Allow permissions have been stripped away.

In this example, the NTFS permissions do not have the W, D, P, and O permissions. The only permissions that the two lists have in common are R and X.

Permissions Required to Run Applications

In most cases, applications get installed into the C:\Program Files\ folder. The default permissions, as shown in Figure 2.29, are typically sufficient for the standard user to execute and use the application.

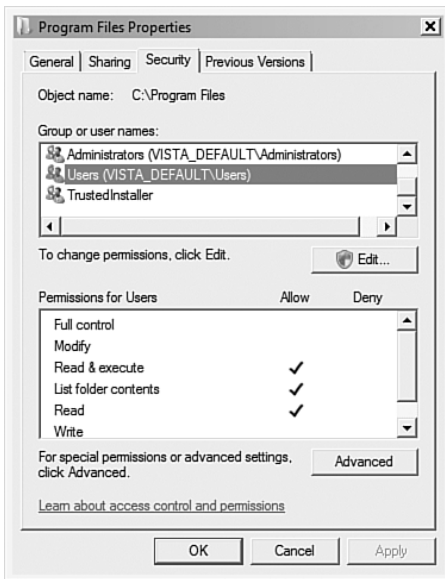


FIGURE 2.29 Default permissions on the Program Files folder.

As Figure 2.29 shows, the Users group is granted Allow—Read and Execute, Allow—List Folder Contents, and Allow—Read. Every standard user account on the computer is a member of the Users group. These permissions are inherited down to all folders and files within the Program Files folder hierarchy. Most applications require the permissions Allow—Read and Execute.

EXAM ALERT

If the application has to write data to its files within this folder structure, the write operation will fail because no Allow—Write permission has been granted for the standard user. You must grant the Allow—Modify or the Allow—Write NTFS permission on the specific file(s) or folder that holds the writable files. (Granting Allow—Modify also grants the Allow—Write NTFS permission, and vice versa.)

Making the standard user an administrator or using the Run as Administrator option to launch the application would also solve the problem because administrators have the Allow—Full Control NTFS permission on the folders within Program Files.

Making the user an administrator for this single purpose is generally considered a violation of the principle of least privilege by granting too much authority, but it *will* solve this permissions problem.

EXAM ALERT

Although it is unusual for an application to be installed elsewhere, if the application is installed in any folder other than the C:\Program Files folder, then even the Allow—Read and Execute, Allow—List Folder Contents, and Allow—Read NTFS permissions must be specifically granted to the desired user(s) just to make the application usable.

Optimizing Performance

Windows Vista has so many slick new multimedia features and applications that computers often “feel the pain” of these heavy applications. It will be your job to configure and maintain these computers so that they are tuned for optimum performance. With applications such as Media Center, Movie Maker, DVD Maker, Meeting Space, and Photo Gallery, and with high-demand gaming application support, you must know where to look to identify which resources are most in demand. You also must know what tools you have available to improve the performance of those system resources.

EXAM ALERT

Computers have four main areas of system resources:

- ▶ CPU
- ▶ Disk
- ▶ Network
- ▶ Memory

The overall performance of the computer will degrade if any of these subsystems is being used at high levels. Applications place different demands on these resources. If the performance of the computer is poor during the use of certain applications or functions, you must first identify which resource is getting hit the hardest. Then you know what you must fix, perform maintenance on, reconfigure, or improve by spending more money on more hardware.

We first look at the tools in Windows Vista that help you analyze how well the system is performing and which of these four subsystems is getting hit the hardest.

Task Manager

Task Manager, affectionately referred to as Taskman, is probably the fastest and easiest way to get a quick look at the performance and health of the system. You can access Task Manager by right-clicking the taskbar and selecting Task Manager; you also can perform the three-fingered salute (Ctrl+Alt+Del) and select the Start Task Manager option, as shown in Figure 2.30.

When Task Manager has started, click the Performance tab to get a quick view of the health of the computer's CPU and memory utilization, as shown in Figure 2.31.

The Networking tab shows how busy the network interface card(s) are. The Processes tab shows which processes are the biggest consumers of the computer's resources. You can sort ascending or descending by clicking the CPU or Memory labels at the top of those fields, as shown in Figure 2.32.



FIGURE 2.30 Start Task Manager.

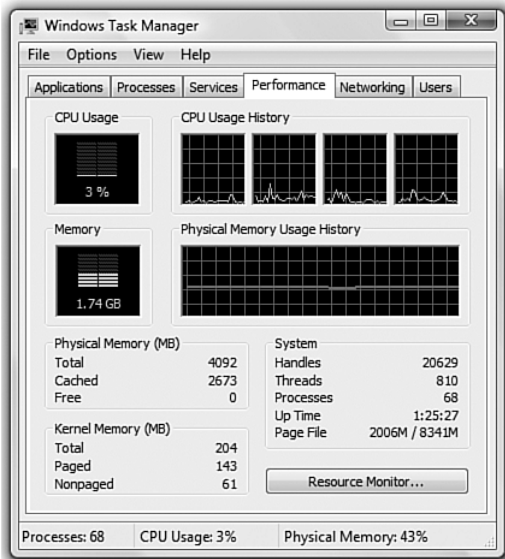


FIGURE 2.31 Task Manager Performance tab.

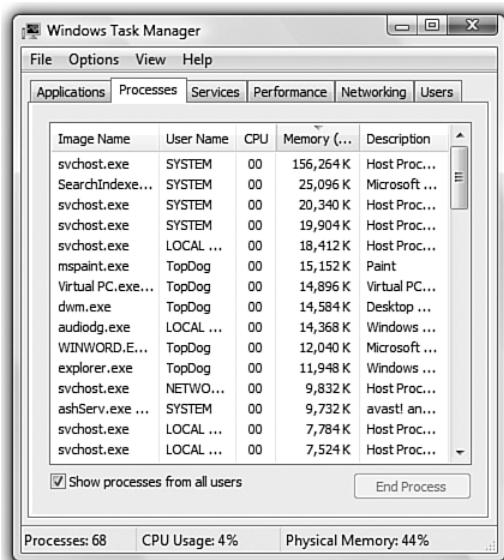


FIGURE 2.32 The Processes tab.

Performance Information and Tools

Another tool to look at is the Performance Information and Tools utility. This is located in Control Panel, System and Maintenance, Check Your Computer's Windows Experience Index (WEI) Base Score.

This brings up the window shown in Figure 2.33.

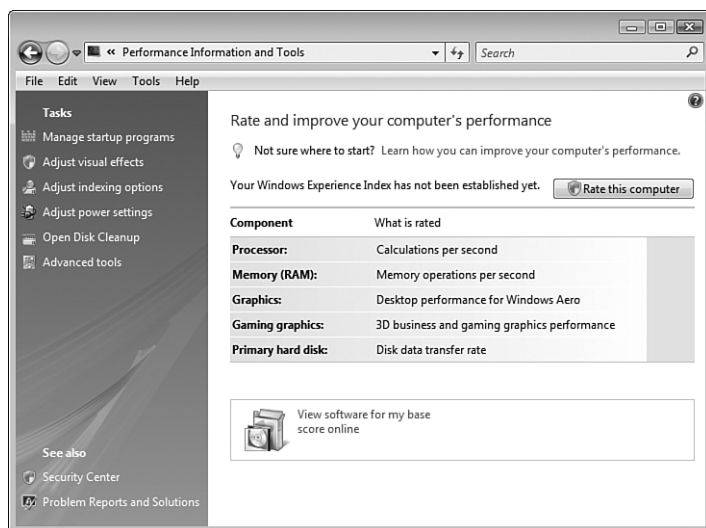


FIGURE 2.33 The Performance Information and Tools utility.

If this is the first time the WEI analysis has been used to initiate the analysis of the computer, click the Rate This Computer button. If WEI has run already, you will see the components' subscores and a base score determined by the lowest of the subscores, as shown in Figure 2.34.

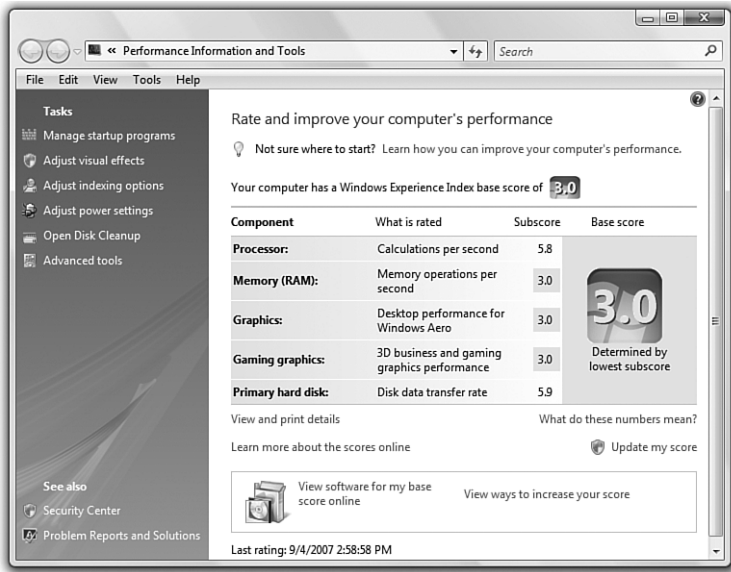


FIGURE 2.34 The Windows Experience Index base score.

EXAM ALERT

These values in the Performance Information and Tools utility give you an indication of which components in the computer are the weakest and could be causing a performance problem. Remember that often the slowest of the components limits the overall performance of the computer.

These subscore values range from 1 to 5.9, with higher values indicating better performance.

Notice that two of the five components address graphics and gaming graphics. This evaluation is nontechnical, using subscore numbers that don't directly tie to any measurement other than serving as a comparative scale of which device is performing the worst. This information is aimed at the home user, who might not be technical in any way, other than being a rock star inside numerous games. This type of user just needs to know what device to spend more money on, without understanding why or how it works that way. But this is still a place where

you need to know to look for performance-related information. If you are technically minded, you can click the View and Print Details link to look at the details. If you do something to the computer that might improve the performance, you can click the Update My Score link.

A system with a base score of 1.x or 2.x is useful for running office productivity applications but not multimedia applications.

A system with a base score of 3.x is useful for running office productivity applications and some lower-end multimedia applications, but it might struggle with some advanced features or applications.

A system with a base score of 4.x or 5.x is useful for running office productivity applications, high-end multimedia applications, and the Windows Vista advanced features or applications.

Reliability and Performance Monitor

Another tool that allows for detailed analysis of the performance of the computer's various components is the Reliability and Performance Monitor, available under Administrative Tools. This tool was formerly known as PerfMon in earlier versions of Windows. As you can see in Figure 2.35, you get a quick look at the utilization of the four major subsystems in the computer on the Resource Overview.

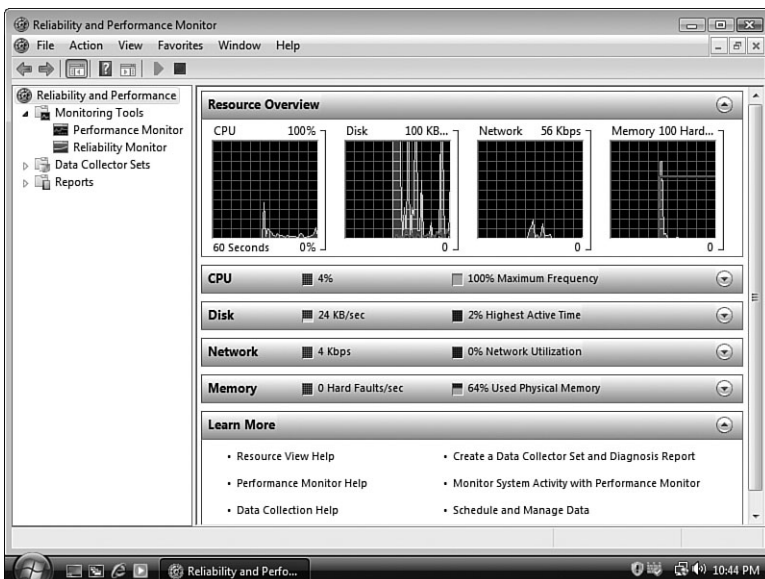


FIGURE 2.35 The four main resource subsystems in the Reliability and Performance Monitor.

EXAM ALERT

This view in the Reliability and Performance Monitor tells you which subsystem is currently being hit the hardest by your resource-intensive applications.

As you click the arrows on the right side of the four summary bars below the graphs, you get detailed information about the various processes using the subsystem component. Again, you can sort these columns by clicking the column title. See Figure 2.36.

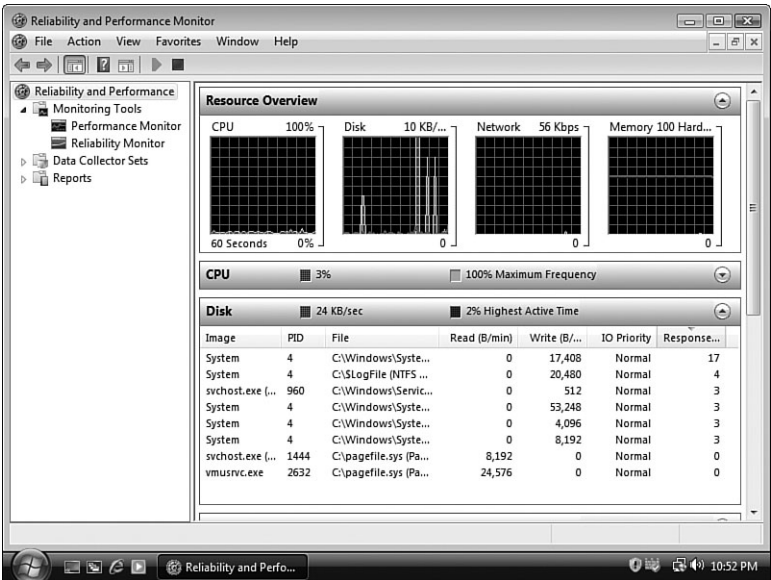


FIGURE 2.36 Subsystem details.

You can also use this tool to record detailed resource consumption information about the local computer or even a remote computer using subsystem Objects, Counters, and Instances in Performance Monitor. You can review these recorded logs later.

Now that you know which resource needs help, you need to know a couple tricks to improve their performance.

Improving Disk Performance

The disk subsystem can become one of the bottlenecks in the system. You need to know how to optimize the performance of the disks in the computer.

Defragmenting the Hard Drive

When a computer begins to move too slowly, defragment the disk. As a computer writes content to a hard disk, it writes it in the available spaces (some big, some little) on the disk. When you edit the files, the computer usually has to write those new changes on a region of the hard disk that is separate from the original pieces of the file. These separate pieces of the file are called fragments. Over time, a hard drive can develop millions of fragments. Now when the computer accesses the file, it must move its relatively slow read/write heads on the drive to the location of each fragment. This physical motion dramatically decreases the performance of the disks and your programs.

EXAM ALERT

You should defragment the disks whenever you perceive that programs are running too slowly.

Redundant Array of Independent Disks (RAID)

Another possible improvement to the performance of the disk subsystem is to implement a RAID array of disks. The fastest RAID array is called RAID 0, or a striped volume. The striped volume requires 2 to 32 physical disks connected locally to the computer. The system then reads and writes to these disks simultaneously to improve performance. The performance benefit increases as you add more disks to the RAID 0 array. The formula to calculate the performance benefit is $\text{time} = 1 / n$, where n is the number of physical disks in the array. Ten disks means reads and writes occur in 1/10 of the time.

EXAM ALERT

Although a RAID 0 array provides the fastest performance, it is not fault tolerant. As a matter of fact, you are more likely to lose all your data on a RAID 0 array than if you stored it on a single disk. This is because if any single disk in the array fails, you lose all the data on all the disks in the array. The more disks are in the array, the more likely one of the disks will fail.

Data stored on a RAID 0 should be transient in nature (so that if you lose it, it doesn't matter) or should be backed up regularly.

To create a RAID 0 array on Windows Vista, you must first have at least two hard disks with free, unallocated space on them. Then launch the Computer Management utility in Start, All Programs, Administrative Tools. Then under Storage, select Disk Management. Right-click one of the new disks and select New Striped Volume, as shown in Figure 2.37.

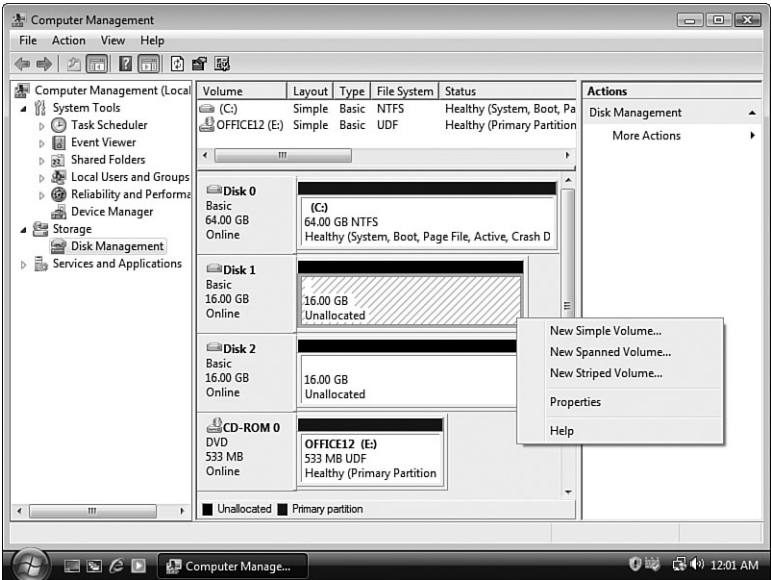


FIGURE 2.37 Creating a RAID 0—Striped Volume array.

Walk through the wizard and add the second disk to the array. The wizard also prompts you to convert the two Basic disks to two Dynamic disks. When you complete the wizard, you should see the new RAID 0—Striped volume, as shown in Figure 2.38.

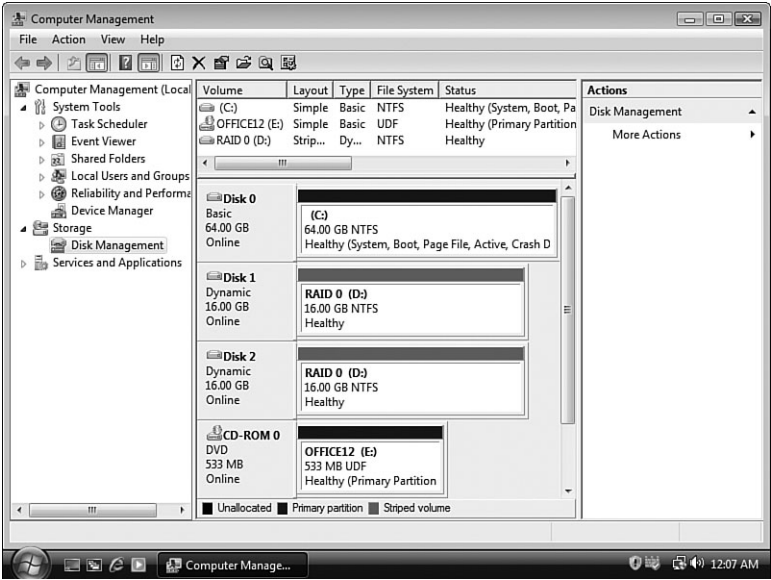


FIGURE 2.38 The RAID 0—Striped Volume array.

EXAM ALERT

If you need to improve the performance of your applications and games, place the programs and their temporary file locations on a RAID 0 array to take advantage of its tremendous speed.

ReadyBoost

The price of nonvolatile, removable media, such as USB thumb drives, SecureDigital (SD) cards, and CompactFlash (CF) memory, has dropped dramatically in the past few years, while the performance of these devices has greatly improved. That's a good combination.

EXAM ALERT

Windows Vista can take advantage of the new, lower-priced Flash memory to improve the performance of these new “heavy” applications and games by implementing a new technology called ReadyBoost.

ReadyBoost uses this high-speed Flash memory in USB thumb drives, SD, and CF devices to cache the contents of the pagefile on the hard drive. The pagefile is used to simulate additional, true physical RAM in a computer to make the computer think it has more RAM than it really does; however, the pagefile lives on the relatively slow hard drive. Accessing this Flash memory is 8 to 10 times faster than accessing the hard drive.

The recommended size of ReadyBoost memory is one to three times that of the physical RAM in the computer, with a minimum size of 256MB. These Flash memory devices usually contain a combination of fast memory and slow memory. ReadyBoost can use only the fast Flash memory.

To configure ReadyBoost on your computer, first plug in a high-speed Flash memory device. After Windows Vista has successfully installed the device as a new drive, open the Explorer application (not Internet Explorer) to view your drive, files, and folders. Now right-click the Flash memory drive and select Properties. Click the ReadyBoost tab. See Figure 2.39.

Select the Use This Device setting to enable the device for ReadyBoost. You can then adjust the amount of free space on the device to allocate to ReadyBoost. Whatever space on the device you allocate to ReadyBoost is now unavailable for your use for storing data. If the ReadyBoost dialog is not available, it means that the device is too slow or doesn't have at least 256MB of free space. Watch for

the ReadyBoost-capable indication on the packaging of the Flash memory when you're buying your Flash memory.

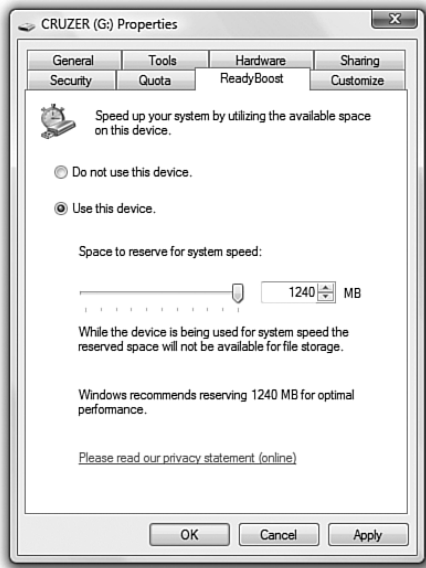


FIGURE 2.39 Configuring ReadyBoost.

Media Center

Windows Media Center (MC) is a visually stimulating application that adds feature-rich multimedia capabilities to your computer. With MC (and the occasional additional piece of hardware, such as a TV tuner, DVD player/burner, and so on), you can watch or record TV or movies on your computer; listen to FM radio stations from around the planet; play, organize, rip, or burn music; view a digital photo collection; import, organize, and play your home videos; and more.

MC is available only on the Home Premium and Ultimate versions of Windows Vista. It is also available in Windows XP Media Center Edition (XP MCE).

Figure 2.40 shows the start screen of Windows Media Center.



FIGURE 2.40 Windows Media Center.

The MC menu features the following options:

- ▶ **Pictures and Videos**—Picture library, capability to play a slide show, video library
- ▶ **Music**—Music library; capability to play music, play online radio stations, or search for music to add to your library
- ▶ **TV and Movies**—Capability to play recorded TV shows and set up your TV tuner
- ▶ **Sports**—What's on now, what's on later, scores summary, players statistics
- ▶ **Online Media**—Capability to access online multimedia streamed content
- ▶ **Tasks**—Capability to change MC settings shutdown, burn CDs and DVDs, sync with other multimedia devices, configure an MC extender, or select to allow media only to hide the Minimize and Close buttons to avoid accidental interruptions or the shutdown of MC, as shown in Figure 2.41



FIGURE 2.41 Use the Media Only setting to avoid accidental interruptions or shutdown of Media Center.

Digital Rights Management (DRM)

Content providers and DRM-compliant multimedia applications, such as Media Center and Media Player, typically use Digital Rights Management (DRM) to control the distribution of digital content, such as music and videos. DRM is applied to the content in the form of media usage rights that act like permissions on the protected content. These media usage rights (also called the DRM license) are not stored on the content itself but are stored on the computer where the DRM content is being accessed. There are separate “rights” to play, burn, and sync digital content. See Figure 2.42 for an example DRM free license; you locate it by right-clicking the digital content file, selecting Properties, and then clicking the Media Usage Rights tab.

To add protection to digital content that you rip or burn to optical media, you must enable DRM in the Windows Media Player or in the Windows Media Center application, as shown in Figure 2.43.

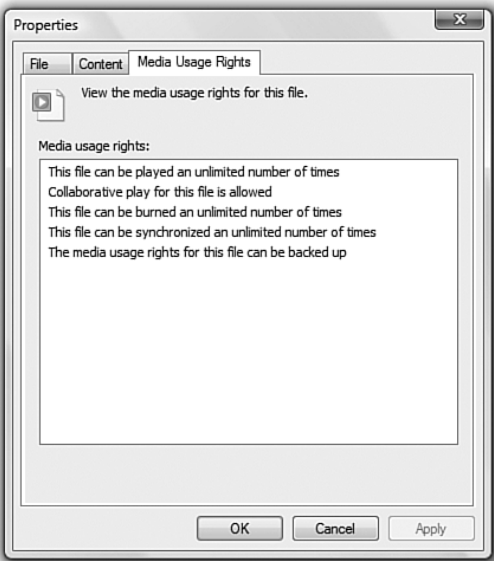


FIGURE 2.42 Media Usage Rights.

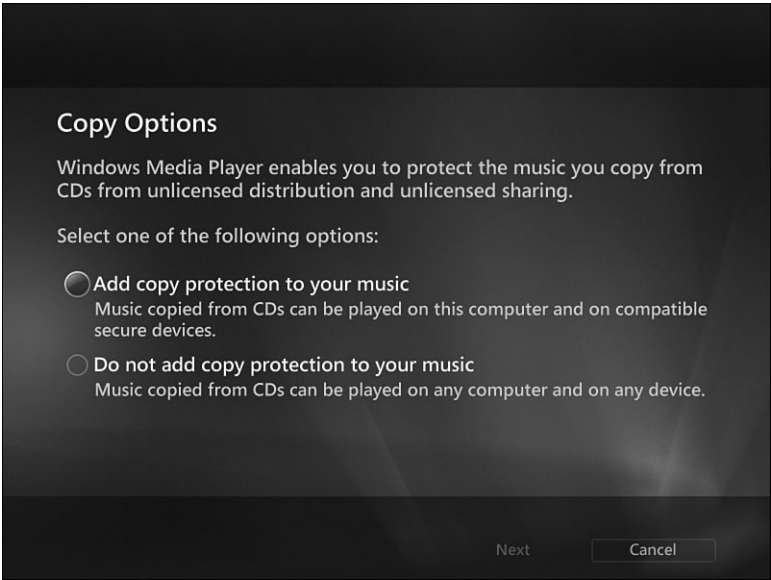


FIGURE 2.43 Selecting the Add Copy Protection to Your Music option implements Digital Rights Management controls on your copied music.

Media Player

Media Player is a multimedia application that is available on all versions of Windows Vista. It is not as fully featured as MC, but it is the tool MC uses to perform many of MC's “under the hood” tasks, such as copying (ripping) music from other media to the Media Player and the MC library.

EXAM ALERT

When using Media Player to rip music into the MC Library, you have two choices on the quality of the ripped music:

- ▶ **Windows Media Audio Variable Bit Rate mode**—Uses a lower bit rate when fewer sounds are being played. This produces smaller files with poorer (but reasonable) quality
- ▶ **Windows Media Audio Lossless mode**—Uses a maximum, constant bit rate. This produces larger file sizes but the best quality.

See Figure 2.44.



FIGURE 2.44 Windows Media Audio Variable bit rate versus Windows Media Audio Lossless.

EXAM ALERT

Media Player is a DRM-compliant application, so when Media Player is used to play music that is protected, appropriate DRM permissions are effective. Furthermore, when Media Player is used to rip music, you can enable the Copy Protect Music option to implement DRM on your copies. You can locate this setting by selecting Rip, More options, as shown in Figure 2.45.

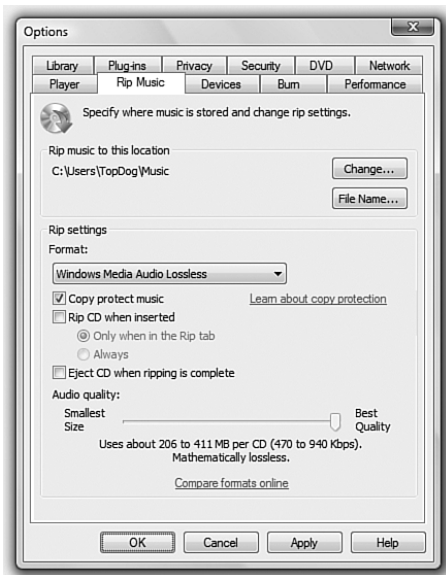


FIGURE 2.45 Copy-protect music.

Media Center Extender

Media Center Extender is a device used to connect your Media Center PC to TV, to bring all the great multimedia components of MC to any room in your house.

These devices, called set-top boxes, are placed near the TV and must connect to the Media Center PC over a wired or wireless network connection. They are manufactured by Microsoft (Xbox 360 is a Media Center Extender) and many other third-party manufacturers, and they are relatively inexpensive (less than \$200 at the time of this writing).

EXAM ALERT

If you want to extend the features of Media Center into more than one room, you must have an Xbox 360 or a Windows Media Center Extender set-top box for each room where you want the Media Center content delivered.

Exam Prep Questions

1. You have just completed the installation of Windows Vista on your computer. After making several configuration changes, you notice that the display is flickering and the image is distorted. You need to correct the video problem. What should you do?
 - ☐ a. Adjust the Display Settings Color depth to 16 bit.
 - ☐ b. Reduce the Display Settings Resolution to 800×600.
 - ☐ c. Reduce the Display Settings Screen refresh rate to 60.
 - ☐ d. Change the Appearance Settings Color scheme to Windows Classic.

2. After the Windows Vista Home Basic installation completes, you run the Setup.exe utility provided by the manufacturer of the video card in the computer. When the video card driver installation completes and you have rebooted the computer, you discover that the option to enable Windows Vista Aero is not available. You need to enable Windows Vista Aero. What should you do? Choose two. Each correct answer presents a part of the answer.
 - ☐ A. Install Windows Vista Business.
 - ☐ B. Download and install Pixel Shader 1.8 for the video card.
 - ☐ C. Add memory to the video card to have 32MB of video RAM.
 - ☐ D. Download and install WDDM drivers for the video card.

3. You share your computer with three other members of your family. You are creating user accounts for these users. You will need to implement different Parental Controls for website access for two of the users. How should you configure the user accounts to support your needs? Choose two. Each correct answer presents a part of the answer.
 - ☐ A. Create each user as an administrator user.
 - ☐ B. Create each user as a standard user.
 - ☐ C. Enable Special Permissions on the iexplore.exe executable.
 - ☐ D. Configure each user account with a password.

4. You are configuring a computer. You must type in the administrator's password with each configuration change. After typing the password 16 times, you decide that you don't want to do that 16 more times as you continue to configure the computer. What should you do?
- ☐ A. Log on as the administrator.
 - ☐ B. Create a new standard user account. Place the new account in the Power Users group. Log on to that account.
 - ☐ C. Add your current account into the Remote Desktop Users group.
 - ☐ D. Grant your account the User Rights Assignment privilege to Allow logon locally.
5. You have replaced your Windows 2000 computer that you have been using for the past six years with a new Windows Vista computer. You have many files, user accounts, music, videos, and photos that you want on the new computer. What should you do?
- ☐ A. Run the AppCompat tool.
 - ☐ B. Run the Upgrade Advisor.
 - ☐ C. Run the Easy Transfer Wizard.
 - ☐ D. Run the Remote Desktop Connection tool.
6. You are trying to access an MS Word document on a remote computer. You need to make permanent changes to the contents of the file. Your attempt to access the file fails. What should you do? Choose two. Each correct answer presents a part of the answer.
- ☐ A. Run the standard user Analysis tool.
 - ☐ B. Ensure that you have at least Allow—Change permissions on the share.
 - ☐ C. Ensure that you have at least NTFS Allow—Modify permissions on the file.
 - ☐ D. Log on as the administrator.
7. You use your new Windows Vista computer to edit your digital videos. After editing your fourth eight-hour video, you notice that the computer seems to be running more slowly than before. You want to improve the performance of the computer. What should you do?
- ☐ a. Defragment the hard drive.
 - ☐ b. Disable ReadyBoost.
 - ☐ c. Reduce the size of the pagefile.
 - ☐ d. Run the MovieMaker application as the administrator.

8. You run disk- and RAM-intensive games on your Windows Vista computer. You want to improve the computer's performance. What should you do? Choose two. Each correct answer presents a part of the answer.
- ☐ A. Configure the application to use a RAID 0 array.
 - ☐ B. Install a USB thumb drive and configure ReadyBoost for that drive.
 - ☐ C. Disable Parental Controls.
 - ☐ D. Ensure that the pagefile resides on the C: drive.
9. You are ripping music to your Windows Vista computer. You want to burn as many songs onto a CD as possible, without giving up too much in the way of quality. What should you do?
- ☐ A. Set the burn speed of the CD burner to the slowest setting.
 - ☐ B. Enable compression on the hard drive that you are ripping the music to.
 - ☐ C. Use the Windows Media Audio Variable Bit Rate Mode.
 - ☐ D. Use the Windows Media Audio Lossless Mode.
10. You want to view the recorded movies in your Media Center PC on your TV in another room. What should you do?
- ☐ A. Disable any firewall exceptions for ports 137 and 138.
 - ☐ B. Install an Xbox 360 on the TV in the other room.
 - ☐ C. Configure Media Player to use a network projector.
 - ☐ D. Configure the Sync option in the Media Center Tasks menu.

Answers to Exam Prep Questions

1. **C.** Flicker and distortion on the monitor are caused by an inappropriate refresh rate. Adjusting the color depth or the resolution to lower values will not address the flicker and distortion. The color scheme only changes the look of the windows and fonts on the desktop.
2. **A and D.** Windows Vista Home Basic does not provide support for Windows Vista Aero. The specifications to support for Windows Vista Aero are as follows:
- ▶ 1GHz 32-bit or 64-bit processor
 - ▶ 1GB RAM
 - ▶ Video graphics adapter with a minimum of 128MB video RAM
 - ▶ DirectX 9-class graphics processor

- ▶ Windows Display Driver Model (WDDM)–compatible driver
 - ▶ Pixel Shader 2.0 in hardware
 - ▶ 32-bit per pixel color depth
3. **B and D.** The two requirements for different Parental Controls are that each user must have a separate, password-protected standard user account. If you created each user as an administrator, you could not assign Parental Controls to those accounts, and even if you could, the users could simply turn off the Parental Controls. Special Permissions are a collection of nonstandard NTFS permissions on the application executable itself. This would not limit or control the websites that the users could access, but it might disable IE's use altogether.
4. **A.** You are being prompted for the administrator password because you have logged on to a standard user account and are required to provide proper credentials to access the elevated privilege required for most configuration changes. The Power Users group provides limited elevated privilege and does not allow you to access the vast majority of configuration dialogs without administrator credentials. The Power Users group is not available in Windows Vista. The Remote Desktop Users group provides for the use of the remote Desktop Connection to this computer and will not allow you to access the configuration dialogs without administrator credentials. You are already logged on locally. This rights assignment does not address the credentials prompt issue.
5. **C.** The Easy Transfer Wizard helps you transfer data from computers running Windows 2000, Windows XP, or Windows Vista to Windows Vista computers. It is useful in transferring the following types of files:
- ▶ User accounts
 - ▶ Files and folders
 - ▶ Program data files and settings
 - ▶ Email messages, settings, and contacts
 - ▶ Photos, music, and videos
 - ▶ Windows settings
 - ▶ Internet settings

Programs and applications are not transferred using this tool.

6. **B and C.** You need appropriate share and NTFS permissions to read and write to the file on the remote computer. The share permission of Allow—Change grants R W X D. The NTFS permission of Allow—Modify grants R W X. Together, the effective permissions for the network user are R W X, which satisfies the objectives. The Standard User Analysis tool reports only and does not make any permissions changes. It doesn't matter which account you log on as; the requirements are that you must have change and modify to be able to read and write to the file. The administrator also requires these permissions and doesn't necessarily have these permissions.

7. **A.** Defragmenting the hard drive improves the performance of the computer. Disabling ReadyBoost and reducing the size of the pagefile both decrease the performance of the computer. Running the video-editing application with elevated privilege does not improve performance of the computer.
8. **A and B.** Installing and configuring the game applications to run on a RAID 0 disk array will dramatically improve the read and write disk performance. ReadyBoost caches the contents of the pagefile, which is used when you have consumed too much RAM, onto much faster nonvolatile RAM, getting it off the slow hard drive. This also improves the performance of the RAM-intensive game application. Parental Controls would be used to disallow the use of the games but cannot control their performance. Moving the pagefile off the C: drive typically improves performance. Ensuring that the pagefile is located on the C: drive usually decreases performance.
9. **C.** The Windows Media Audio Variable Bit Rate Mode uses a lower bit rate when a recording has fewer sounds. This reduces the file size and enables you to pack more songs onto the CD. This also provides a pretty good recording, but not the best. Burning at a slower speed does not reduce file sizes, but it does help to ensure a more reliable disk. Compression on the hard disk will not help when you burn the songs to the CD. The files would have to be decompressed to get them off the hard disk. Windows Media Audio Lossless mode maximizes the quality and file size of the songs. This would not satisfy the requirements.
10. **B.** To connect a Media Center PC to a TV, you need a Media Center Extender. Microsoft Xbox 360 is a Media Center Extender. The Media Center Extender must connect to the Media Center PC over a network connection, and the appropriate firewall exceptions must be enabled. Disabling firewall exceptions will not help you connect the Media Center Extender to the Media Center PC. The network projector would be used to project the media content onto a wall or projection screen, not a TV. The Sync option is to connect and sync cameras and other handheld or disconnected devices with Media Center, not connect to Media Center Extenders.

Suggested Readings and Resources

The following websites present a wealth of technical information relating to the topics discussed in this chapter. On a web page, additional hyperlinks often address related topics to help you deepen your knowledge and understanding of the topic. Some of these hyperlinks might require a subscription to Microsoft TechNet.

1. Windows Sidebar:

<http://tinyurl.com/25kth7>

<http://tinyurl.com/5yddbb7>

2. Windows Vista Aero:

<http://tinyurl.com/ysl1fz>

<http://tinyurl.com/8tj8r>

3. Windows Vista User Accounts:

<http://technet.microsoft.com/en-us/windowsvista/aa906021.aspx>

<http://tinyurl.com/v5fwh>

<http://tinyurl.com/39w6bb>

<http://tinyurl.com/2zoljo>

4. Standard User Analyzer—Inside the Microsoft Application Compatibility Toolkit 5.0

<http://technet.microsoft.com/en-us/windowsvista/aa905102.aspx>

5. Permissions to run applications

<http://tinyurl.com/v5fwh>

<http://support.microsoft.com/kb/922708>

<http://support.microsoft.com/kb/277867>

<http://tinyurl.com/2x5ouo>

www.microsoft.com/technet/technetmag/issues/2007/04/VistaKernel/

6. Performance

<http://tinyurl.com/47q8md>

<http://technet.microsoft.com/en-us/windowsvista/aa905077.aspx>

www.microsoft.com/whdc/system/sysperf/accelerator.msp

<http://technet.microsoft.com/en-us/windowsvista/aa905071.aspx>

<http://tinyurl.com/yskfh2>

7. ReadyBoost

<http://tinyurl.com/257gf3>

<http://tinyurl.com/2bo2qw>

8. RAID 0

<http://technet.microsoft.com/en-us/library/aa995741.aspx>

<http://en.wikipedia.org/wiki/RAID>

http://en.wikipedia.org/wiki/Data_stripping

9. Media Center

<http://tinyurl.com/2qxuyd>

<http://tinyurl.com/4zv5wm>

10. Media Center Extender

<http://tinyurl.com/2hqzwq>

<http://tinyurl.com/22jq7g>

<http://tinyurl.com/4db2nr>

<http://tinyurl.com/3edxms>

<http://tinyurl.com/44cr6r>

11. Media Player

www.microsoft.com/windows/windowsmedia/player/11/default.aspx

<http://tinyurl.com/3nvmfz>

<http://tinyurl.com/y7jgqj>

12. Digital Rights Management

<http://tinyurl.com/4vjyrvw>

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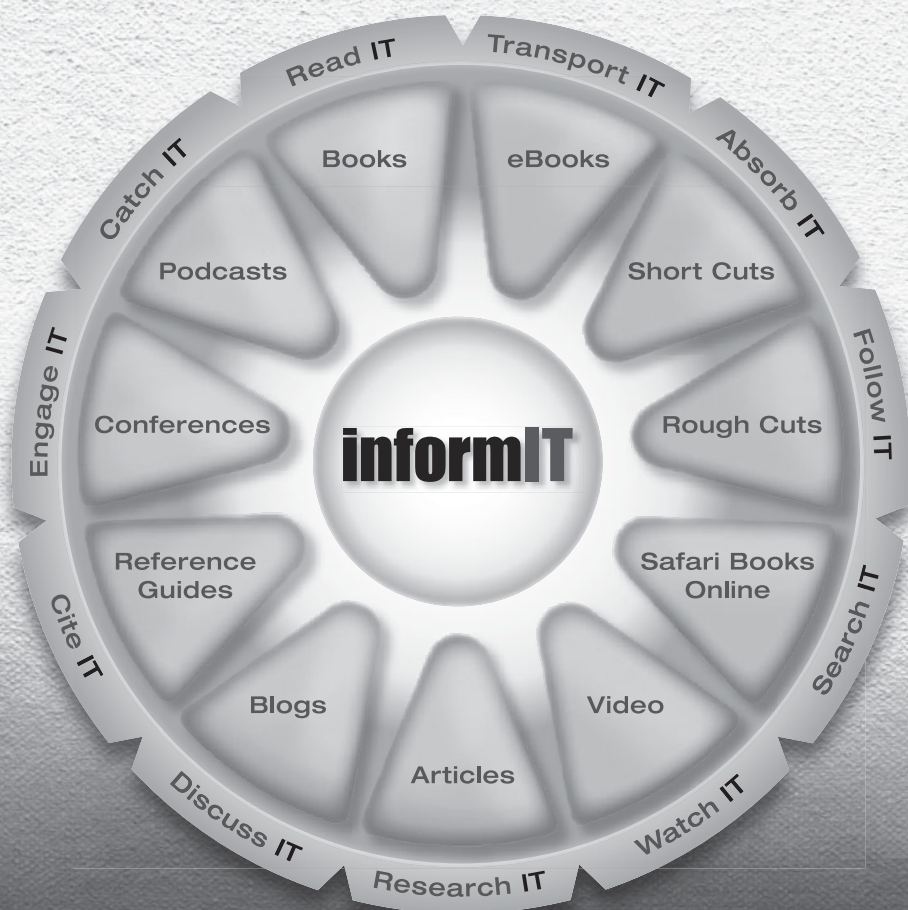
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EXAM✓CRAM

Exam 70-623 Cram Sheet

This Cram Sheet contains the distilled, key facts about the Microsoft Exam 70-623, “PRO: Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians.” Review this information as the last thing you do before you enter the testing center, paying special attention to those areas where you feel you need the most review.

INSTALLING AND UPGRADING WINDOWS VISTA

1. Microsoft defines two hardware levels for Windows Vista: Windows Vista Capable and Windows Vista Premium Ready.
2. For a system to be Windows Vista Capable (capable to run Windows Vista Business and Windows Vista Enterprise versions), it must have a 800MHz processor, 512MB of RAM, and 15GB of free disk space.
3. For a system to be Windows Vista Premium Ready (runs all versions of Windows Vista and supports the new Windows Aero interface), it must have a 1GHz processor, 1GB of RAM, and 15GB of free disk space.
4. Windows System Image Manager (Windows SIM) is a tool that enables you to create answer files and network shares or to modify the files contained in a configuration set. The Windows SIM is part of the Windows Automated Installation Kit (WAIK), which is included with BDD 2007.
5. An answer file is an XML file that scripts the answers for a series of graphical user interface (GUI) dialog boxes and other configuration settings to be used to install Windows Vista.
6. Windows Image is a single compressed file that contains a collection of files and folders that duplicate a Windows installation on a disk volume. Windows Vista is built and distributed as a single image using the new Windows Imaging (.wim) file format.
7. Catalog is a binary file (.clg) that contains the state of the settings and packages in a Windows image.
8. Windows PE is a bootable tool that replaces MS-DOS as the preinstallation environment to install, troubleshoot, and recover Windows Vista.
9. ImageX is a command-line tool that captures, modifies, and applies installation images for deployment in a manufacturing or corporate environment.
10. Windows Setup (setup.exe) is the program that installs the Windows Vista operating system. Previous Windows version installation executables Winnt.exe and Winnt32.exe have been removed.
11. Diskpart is a command-line hard-disk configuration utility.
12. Sysprep is a utility that facilitates image creation for deployment to multiple destination computers by removing the original security identifiers (SIDs) from the image and cleaning up various user and machine settings and log files.
13. You can upgrade (in place) Windows XP Pro to Windows Vista Business and Ultimate editions. You can upgrade Windows XP Home to Windows Vista Home Basic, Home Premium, Business, and Ultimate editions.
14. You can use the Windows Vista Upgrade Advisor to determine which version of Windows Vista is right for you and to determine which applications and device drivers will run with Vista, as well as which hardware needs to be upgraded.
15. To migrate user settings from one computer to a Windows Vista computer, use Windows Easy Transfer (WET) or User State Migration Tool (USMT).
16. Using Windows Anytime Upgrade, you can upgrade Windows Vista to higher editions of Windows Vista:
 - ▶ Home Basic edition to Home Premium, Business, Enterprise, and Ultimate editions
 - ▶ Business edition to Enterprise and Ultimate editions
 - ▶ Enterprise edition to Ultimate edition
17. Windows Aero is *not* available in the Vista Home Basic edition but is available in all other versions.
18. Windows Media Center is available in the Vista Home Premium and Ultimate editions.
19. Parental controls are available in the Vista Home Basic, Home Premium, and Ultimate editions.
20. BitLocker is available only in the Vista Enterprise and Ultimate editions.
21. Windows Vista Startup Repair (executed from the Windows installation disk or loaded on your hard drive) is a Windows recovery tool that can fix certain problems, such as missing or damaged system files that might prevent Windows from starting correctly.
22. Device drivers are programs that control a device. They act like a translator between the device and programs that use the device.
23. To ensure reliability, a signed driver is a device driver that includes a digital signature, which is an electronic security mark that can indicate the publisher of the software and information that can show whether a driver has been altered.

24. By default, the Driver Signing Policy in Windows Vista notifies you if a driver is not signed, is signed by a publisher that could not be properly identified, or has been altered since its release.
25. The Device Manager lists all hardware devices on your computer and enables you to change the properties for any device and update drivers.
26. During installation, you might need to select the Load Drivers option if your controller is not on the Hardware Compatibility List (HCL).
27. After Vista is installed, you can use the Add Hardware utility in the Control Panel to add legacy device drivers or non-PnP device drivers. The Add Hardware utility is available only in Classic View.

CONFIGURING AND TROUBLESHOOTING POST-INSTALLATION SYSTEM SETTINGS

1. Windows Aero is the premium visual experience of Windows Vista that features a transparent glass design with subtle window animations and new window colors.
2. Part of the Windows Aero experience is Windows Flip 3D, which is a way to arrange your open windows in a three-dimensional stack that you can quickly flip through without having to click the taskbar.
3. To enable Windows Aero, you need a WDDM driver, a color depth set to 32-bits per pixel (bpp), a refresh rate that is higher than 10Hz, the theme set to Windows Vista, the color scheme set to Windows Aero, and Window frame transparency turned on.
4. Correct the Refresh Rate on the video adapter to avoid flickering of the display.
5. To secure content on a shared computer or shared folder, configure standard user accounts, NTFS permissions, and password-protected sharing.
6. Share permissions are managed by the Server service and include Read (and Execute), Change, and Full Control.
7. The NT File System (NTFS) manages NTFS permissions, which include Read and Execute, Write, Modify, and Full Control.
8. Printer permissions include Print, Manage Documents, and Manage Printer.
9. Simple sharing uses the permissions named Reader (Read and Execute), Contributor (Read to all, Write to all, and Delete their own content), and Co-owner (Read to all, Write to all, and Delete all content).
10. Users can enable their Public folder share to provide content access to users on the same computer or on the network.
11. Parental Controls enable administrators to control which websites, programs, and games each standard user can use and install, and what time each user can use the computer.
12. Parental Controls must be set by an Administrator User account and can be set only on standard user accounts.
13. Parental Controls generates a report of controlled user activity that should be viewed by the administrator.
14. The Ease of Access Center is a central location that you can use to set up the accessibility settings and programs available in Windows.
15. Internet Explorer has a Security status bar that uses color-coded notifications next to the address bar to keep you notified of website security and privacy settings.
16. Internet Explorer 7.0 offers a Phishing filter that helps protect you from online phishing attacks, fraud, and spoofed websites.
17. Internet Explorer 7.0 offers Protected Mode, which helps protect you from websites that try to save files or install programs on your computer.
18. Dynamic Security options for Internet Explorer 7.0 offer multiple security features to defend your computer against malware and data theft.
19. To reset Windows Internet Explorer, click the Reset button within the Advanced tab. If you want to reset the Advanced options, click the Restore Advanced Settings button.
20. Adding the URL or UNC of a trusted server to the Trusted Sites Zone in Internet Explorer (IE) eliminates prompting and warning.
21. If the new Phishing Filter feature in Internet Explorer inaccurately declares a trusted site to be a phishing site, you can report the mistake to Microsoft by choosing the menu item "I don't think this is a phishing Website."
22. To avoid the warning about a certificate from an untrusted site, import the certificate into the browser's Trusted Root Certification Authorities list.
23. Many security configuration settings do not apply until IE is closed and then reopened.
24. Outlook Web Access uses a Calendar Reminder pop-up that must be allowed in IE.
25. When you subscribe to an RSS feed, Internet Explorer automatically checks the website and downloads new content so you can see what has changed since you last visited the feed.
26. Create a Password Reset disk (for local logons only) if you are concerned about forgetting your password.
27. Printer drivers must be compatible with Windows Vista. Earlier version printer drivers are incompatible with Vista.
28. Use the Convert X: /FS:NTFS command to convert the FAT file system on the X: drive to NTFS. To undo this command before reboot, you must edit the Registry.

CONFIGURING WINDOWS SECURITY FEATURES

1. User Account Control (UAC) is a feature in Windows Vista that can help prevent unauthorized changes to your computer. If you are logged in as an administrator, UAC prompts you for permission; if you are logged in as a standard user, UAC asks you for an administrator password.
2. You can disable UAC prompting for elevated privilege.
3. You can enable or disable UAC for any individual user account by using the Control Panel. You can also control the behavior of the UAC by using local or group policies.

4. If you have an older application that requires administrative permissions to run, you can use the Application Compatibility tab to select the Run This Program As an Administrator option, which allows the application to use the UAC system to request privilege escalation.
5. Malware is often configured to launch during startup and can affect configuration files, such as the hosts file used for sockets-based (versus NetBIOS-based) name resolution.
6. A tool called the Rootkit Revealer by Windows Sysinternals helps identify and repair a compromised system.
7. Windows Defender helps users detect and remove known spyware and other potential unwanted software.
8. A quick scan using Windows Defender checks areas on a hard disk that spyware is most likely to infect.
9. When you perform a scan, you can configure what Windows Defender will do when it identifies unwanted software.
10. If you want Windows Defender to *not* flag a program as possible spyware, you should select Always Allow.
11. Software Explorer enables you to view or remove any program that executes during startup.
12. Windows Defender in Windows Vista automatically blocks all startup items that require administrator privileges to run.
13. MSConfig, the System Configuration utility, also enables you to view and control what applications and services launch at startup.
14. Windows Firewall is a packet filter and stateful host-based firewall that allows or blocks network traffic according to the configuration.
15. By default, Windows Firewall is on.
16. By default, Windows Firewall blocks most programs from communicating through the firewall. Therefore, you must add an exception for a port or program.
17. To allow access to newsgroups, enable an exception for the NNTP protocol.
18. If you do not want any inbound connections to your computer, use the Firewall option: Block All Incoming Connections.
19. The new Windows Firewall with Advanced Security is a Microsoft Management Console (MMC) snap-in that gives IT professionals more advanced options, including the capability to set up and view detailed inbound and outbound rules and integrate with Internet Protocol Security (IPSec).
20. The Security Center is a single location where you can view status and configure Windows Firewall, Windows Update, Windows Defender, IE security, User Account Control, and Vista/WMI-compatible antivirus software.
3. Vista uses the Workstation service to connect to remote computers; Vista uses the Server service to create folder and printer shares.
4. Vista uses the Network Discovery feature to detect remote computers.
5. Vista supports both IPv4 and IPv6.
6. DHCP automatically configures TCP/IP information on client computers.
7. The `ipconfig` command displays current TCP/IP configuration. It can also be used to release (`/release` option) and renew (`/renew` option) DHCP configuration, and to flush the DNS cache (`/flushdns` option).
8. Disable and then enable the NIC to reset configuration settings for the adapter.
9. The `ping` command verifies connections to a remote computer by verifying configurations and testing IP connectivity.
10. To connect to the Internet, you need a minimum of an IPv4 IP address, a subnet mask, a default gateway, and the IP address of a DNS server.
11. A hosts file can include the hostname and mappings of the fully qualified domain name (FQDN) to the IP address. If this information is incorrect for a server, you must remove the mapping before you can connect to the server.
12. To use Remote Assistance, first you invite a person to help you, using email or an instant message. You can also reuse an invitation that you have sent. Remote Assistance requires that both users are available at their desktops. Unlike Remote Desktop, Remote Assistance does not work if one of the desktops is unattended.
13. On wireless networks, the SSID broadcast is often turned off. To connect to these networks, you must manually configure the connection to automatically connect, even if there is no SSID broadcast.
14. If a wireless network has too much traffic, segment the network by using a second SSID and have half of the users use the second SSID.

TROUBLESHOOTING AND REPAIRING WINDOWS VISTA

1. Windows Media Player 11 is an all-in-one media player that enables you to copy (rip) and play most media files with an easy-to-use, intuitive interface.
2. Rip Lossless is the highest-quality copy setting for music in Media Player.
3. To limit where ripped music can be played, copy-protect the music when it is ripped. This embeds Digital Rights Management (DRM) into the music.
4. A codec, an abbreviation for compressor/decompressor, is software or hardware used to compress and decompress digital media, such as a song or video.
5. If you want to play a DVD, you need a DVD decoder, also known as an MPEG-2 decoder. Only Windows Vista Home Premium and Windows Vista Ultimate ship with an MPEG-2 decoder.
6. The commercial DVD video player specification dictates that DVD players must be coded to play disks that contain the region code for the country in which they were sold.

CONFIGURING, TROUBLESHOOTING, AND REPAIRING NETWORK CONNECTIVITY

1. The Network and Sharing Center enables you to check your connection status, view your network, and troubleshoot connection problems.
2. Windows Network Diagnostics analyzes the problem and, if possible, presents a solution or a list of possible causes.

7. Media Player can be configured with Media Player Network Sharing to allow others to access your content.
8. The Windows Media Center enables you to manage and play back all your digital media through one interface, including live and recorded TV, movies, music, and pictures.
9. The Reliability and Performance Monitor helps identify the system resource that is causing media-playback problems.
10. Enable the Media Only setting to avoid interruptions during playback of a music play list.
11. If your computer has no TV tuner, you must have an optional analog or digital TV tuner to play and record TV in Windows Media Center.
12. Add Media Center Extenders or Xbox 360 units to play back media on multiple TVs.
13. Photo Gallery synchronizes pictures from a camera to Windows Vista.
14. Movie Maker enables you to download video from digital camcorders. The camcorder must be in Playback mode.
15. To create the highest-quality High Definition video, use the HD 1080p setting.
16. Windows Mail enables you to send, receive, and organize email. It also includes improved stability over Outlook Express, enables real-time search, and provides enhanced security with a Phishing filter and junk mail filtering.
17. The Windows Fax and Scan program enables users to use a scanner to scan a document or picture into the system, email those documents, fax documents using a fax modem or fax server, and receive faxes from other fax machines.
18. Windows Meeting Space, which is a replacement for NetMeeting, gives you the capability to share documents, programs, or your entire desktop with other people.
19. One of the advantages of using Windows Meeting Space is that it uses peer-to-peer technology that automatically sets up an ad hoc network if it can't find an existing network.
20. Windows Live Messenger requires an audio headset and camera to enable the Video Phone feature.
21. The Windows Sidebar is a pane that keeps your gadgets organized and always available. You add the desired gadgets to the Sidebar.
22. Gadgets are easy-to-use mini programs that give you information at a glance and provide easy access to frequently used tools; you can check the weather, check the time using a digital clock, or check email without opening other programs.
23. Windows Reliability and Performance Monitor is a Microsoft Management Console (MMC) snap-in that provides tools for analyzing system performance. From a single console, you can monitor application and hardware performance in real time, customize what data you want to collect in logs, define thresholds for alerts and automatic actions, generate reports, and view past performance data in a variety of ways.
24. Windows Task Manager enables you to view real-time system performance.
25. You should periodically use the Check Disk tool (chkdsk) to check the integrity of disks and examine and correct many types of common errors.
26. To reduce fragmentation, Windows Vista automatically defragments a disk periodically using Disk Defragmenter.
27. Windows ReadyBoost boosts system performance for demanding applications, such as games, by using high-speed Flash memory devices as additional sources for caching.
28. RAID 0, the striped volume, is the fastest disk array, but it has no fault tolerance.
29. Drives (partitions) can be extended if the system has unallocated disk space.
30. The Backup utility uses the Volume Shadow Copy Service (VSS) to capture open files for a backup.
31. Backups can be performed on certain types of files, based on the file extension.
32. The Advanced Boot Options menu lets you start Windows in advanced troubleshooting modes.
33. Safe Mode, found in Advanced Boot Options, starts Windows with a minimal set of drivers and services, and should be used when you load an incompatible video driver.
34. Last Known Good Configuration (Advanced) starts Windows with the last Registry that worked when the last user logged on successfully.
35. System Restore takes regular snapshots of the system called Restore Points.
36. You must be an administrator to manually create a Restore Point.
37. Boot on Vista installation media to perform a startup repair, a complete PC restore, or a system restore.
38. Use the System File Checker (SFC) utility /scannow to detect and repair missing, corrupt, or incorrect operating system files.
39. Use the BCDEdit utility to fix Start menu items.
40. To connect Bluetooth devices to the Vista computer, place the computer in Discovery mode and the Bluetooth device in Discoverable mode (also called Find Me mode).
41. You must accept the beam request to transfer a file over an Infrared (Ir) connection.
42. Windows Vista includes the Windows Mobility Center, which provides a single location that enables you to quickly adjust mobile PC settings.
43. A power plan is a collection of hardware and system settings that manages how your computer uses and conserves power.
44. The new Windows Vista Mobile Device Center provides a single easy-to-use interface to manage data synchronization with mobile devices you connect to your computer.
45. When an offline folder is created, Windows automatically creates a copy of that file or folder on your computer. Anytime you reconnect to that network folder, Windows syncs the files between your computer and the network folder. You can also sync them manually at any time.