Microsoft

Ed Bott, Carl Siechert, and Craig Stinson

Windows® 7

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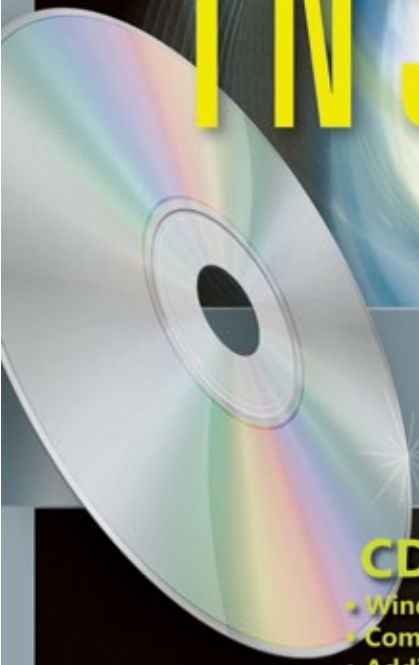

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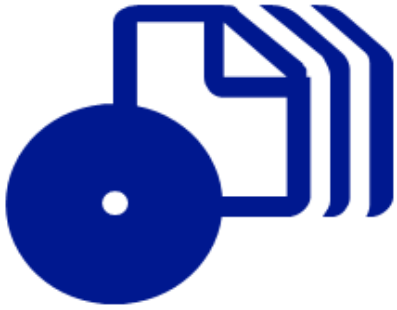

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In memory of
Jean Varven Stinson
1952–2010

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www.microsoft.com/learning/booksurvey/

Foreword to *Windows 7 Inside Out*

Individually and collectively, the three authors who wrote *Windows 7 Inside Out* have been working with Windows for as long as many of the most senior developers at Microsoft. Ed, Carl, and Craig focus on Windows from a unique perspective—they are experts and enthusiasts who want to share their expertise and enthusiasm with you.

With Windows 7, our development team was dedicated to building a brand new release of the OS while also making sure your investments in hardware and software are effectively brought forward. We took a deliberate approach to building new features, refining existing features, and making sure at every step we were true to our goals of delivering an awesome release of Windows. Ed, Carl, and Craig do an awesome job of providing readers with the ins and outs of the full range of features of Windows 7, which will help you to get the most out of the product.

As we engineered Windows 7, we opened a dialog with a broad community of enthusiasts on our Engineering Windows 7 blog (*blogs.msdn.com/b/e7*). Through this blog, we discussed the engineering side of building Windows 7—from the bottom up, so to speak. We know that for many, these topics were interesting as Windows 7 was being developed. Through the blog and through all of our forms of learning as we developed Windows 7, we were asked many questions not just about the "how" but about the "why" of features. We offered our insights from the product development perspective. With their unique perspective, few are more qualified to offer further explanations of the ins and outs of Windows 7 than the authors of *Windows 7 Inside Out*.

With Windows 7 now in the hands of customers around the world, our collective interests turn to making the most of Windows 7. I know from 15 years of following the work of Ed, Carl, and Craig that they have the same commitment to delivering real-world advice from a perspective that is grounded in experience and knowledge of how Windows works. Over the years, they've met with many teams here in Redmond to talk about Windows and how they can help you, our shared customers and readers, be more productive. I hope you enjoy *Windows 7 Inside Out*.

Steven Sinofsky
President, Windows Division
Microsoft Corporation

Foreword

When we began designing Windows 7, we thought a lot about how you use your PC. Our goal was to make your experience simpler, so that you can concentrate on the tasks you're trying to accomplish. Since we released Windows 7 in 2009, we've been gratified by the positive response to our work from hundreds of millions of customers worldwide.

We didn't stop working on launch day, and neither did the authors of *Windows 7 Inside Out*. We've delivered a steady stream of updates to Windows in the past two years, including Service Pack 1, Internet Explorer 9, and Windows Live Essentials 2011.

In this Deluxe Edition, Ed, Carl, and Craig have once again done a thorough job of explaining not just *how* Windows works but *why* we designed it the way we did. They understand that Windows isn't just a collection of features—it's a series of end-to-end experiences. They've spent a tremendous amount of time in the Windows community over the past couple years learning from you, and they've incorporated that learning into this impressively expanded edition.

The authors of *Windows 7 Inside Out* have been doing what they do for a long time. They get Windows in a way that few others do. We hope this Deluxe Edition will help you make the most of Windows 7.

Julie Larson-Green
Corporate Vice President, Windows Experience
Microsoft Corporation
June 2011

Introduction

By some measures, Windows 7 sets a new standard for usability. It needs less out-of-the-box tweaking and troubleshooting than any Windows version we've ever used. The arrangement of folders and files in Windows Explorer, basic system security, User Account Control settings, and numerous other default configuration options are well thought out. Adding a new hardware device typically requires nothing more than just plugging it in, and setting up a network no longer entails invoking supernatural help.

Despite all that—or perhaps because of it—we have plenty of good stuff to share with you in this edition of *Windows 7 Inside Out*. The good news: we don't need to spend a lot of ink on Windows 7 features that work as expected. That allows us to concentrate on the many capabilities and features that are buried just beneath the surface. We cover the handful of essential tasks—backing up your computer, for example—that aren't configured automatically. We've also brought together countless shortcuts, tips, and tricks to help you perform tasks more quickly and with less aggravation.

This *Deluxe Edition* adds several chapters not included in the original edition, giving us the space to dive deeper into media applications, networking, scripting, and deployment of Windows throughout a small organization. Perhaps more important, spread throughout this edition are additional tips and explanations based on many, many hours of poking, probing, and studying Windows 7 in the two years since its release. This book also covers the latest changes to the operating system, notably Service Pack 1, as well as a new version of Internet Explorer and an impressively updated collection of programs in Windows Live Essentials 2011.

Who This Book Is For

This book offers a well-rounded look at the features most people use in Windows. It serves as an excellent reference for anyone who wants a better understanding of how Windows 7 works. If you're a Windows expert in training, or if your day job involves IT responsibilities, or if you're the designated computer specialist managing computers and networks in a home or small business, you'll discover many sections we wrote just for you. And if you consider yourself a Windows enthusiast, well, we hope you'll find enough fun and interesting tidbits to keep you interested—because, after all, we're unabashed enthusiasts ourselves.

Assumptions About You

This book, like others in the *Inside Out* series, is designed for readers who have some experience with the subject. It touches only briefly on some of the basic topics that you'll find

covered in more detail elsewhere (for those, we recommend other Microsoft Press titles, such as *Windows 7 Step by Step* or *Windows 7 Plain & Simple*).

Whether your experience comes from Windows 7 or an earlier version, we expect that you are comfortable finding your way around the desktop, browsing folders with Windows Explorer, launching programs, using copy and paste operations, and finding information in a web browser. We don't assume that you're a hardware tinkerer, a hacker, a hardcore gamer, or a code jockey.

How This Book Is Organized

Part 1, "Getting Started," describes your initial Windows experiences: installing and configuring Windows, working with programs, adding Windows Live Essentials, personalizing Windows to your needs, and using Internet Explorer.

Part 2, "File Management," explains how to organize your folders and files, how to find those files when you need them, and how to back them up to ensure that they're always available. It also covers the ins and outs of Windows search technologies.

Part 3, "Digital Media," explores the rich media features of Windows 7, including playing, sharing, and syncing media. This edition includes expanded coverage of Windows Media Center and other Microsoft media products, such as the Xbox 360 and the elegant, powerful Zune software.

Part 4, "Security and Networking," explains how to set up a network so that you can share files, printers, Internet connections, and other resources among all your computers—and how to properly implement security measures so that you can do so safely.

Part 5, "Tuning, Tweaking, and Troubleshooting," covers routine maintenance tasks and explores tools and techniques for measuring and improving your computer's performance. Other topics include Windows PowerShell scripting, troubleshooting methods, and deployment of Windows to multiple computers.

Part 6, "Windows 7 and PC Hardware," looks at details of the devices on which Windows runs, including setup and configuration, management of hard disk drives, and use of input methods other than the keyboard and mouse (namely, pen, touch, and speech).

Part 7 comprises a handful of appendixes that provide reference information, including concise looks at the differences among Windows 7 editions, changes wrought by Service Pack 1, and accessory programs that are part of Windows.

Features and Conventions Used In This Book

This book uses special text and design conventions to make it easier for you to find the information you need.

Text Conventions

Convention	Meaning
Abbreviated commands for navigating the ribbon	For your convenience, this book uses abbreviated commands. For example, "Click Home, Insert, Insert Cells" means that you should click the Home tab on the ribbon, then click the Insert button, and finally click the Insert Cells command.
Boldface type	**Boldface** indicates text that you type.
Initial Capital Letters	The first letters of the names of tabs, dialog boxes, dialog box elements, and commands are capitalized. Example: the Save As dialog box.
Italicized type	*Italicized* type indicates new terms.
Plus sign (+) in text	Keyboard shortcuts are indicated by a plus sign (+) separating key names. For example, Ctrl+Alt+Delete means that you press the Ctrl, Alt, and Delete keys at the same time.

Design Conventions

INSIDE OUT

This statement illustrates an example of an "Inside Out" heading

These are the book's signature tips. In these tips, you get the straight scoop on what's going on with the software—inside information about why a feature works the way it does. You'll also find handy workarounds to deal with software problems.

Sidebar

Sidebars provide helpful hints, timesaving tricks, or alternative procedures related to the task being discussed.

TROUBLESHOOTING

This statement illustrates an example of a "Troubleshooting" problem statement

Look for these sidebars to find solutions to common problems you might encounter. Troubleshooting sidebars appear next to related information in the chapters. You can also use "Index to Troubleshooting Topics" at the back of the book to look up problems by topic.

Cross-references point you to locations in the book that offer additional information about the topic being discussed.

CAUTION!

Cautions identify potential problems that you should look out for when you're completing a task or that you must address before you can complete a task.

Note

Notes offer additional information related to the task being discussed.

When an example has a related file that is included on the companion CD, this icon appears in the margin. You can use these files to follow along with the book's examples.

About the CD

The companion CD that ships with this book contains many resources to help you get the most out of your Inside Out book.

If you bought a digital edition of this book, you can enjoy select content from the print edition's companion CD. Visit *http://www.microsoftpressstore.com/title/9780735656925*. to get your downloadable content. This content is always up-to-date and available to all readers.

What's on the CD

Your Inside Out CD includes the following:

- **Complete eBook** Enjoy the entire electronic version of this title.
- **Resources** Reference white papers, user assistance, and product support to help you use and troubleshoot the features of Windows 7.

- **Product Information** Explore the features and capabilities of Windows 7 and learn how other Microsoft products and technologies can help you at work and at home.
- **Tools** Link to tools for PowerShell, application compatibility, IEAK, WAIK, and Windows 7 Upgrade Advisor.
- **Sample Scripts** Discover more than 80 Windows PowerShell scripts you can customize and use to configure and manage computers running Windows 7. Here is a listing of the scripts arranged by the chapter in which each is introduced:

Chapter	PowerShell Scripts
2	DisplayProcessor.ps1 Get-OSVersion.ps1 Get-ProcessorArchitecture.ps1 Get-WindowsEdition.ps1 ListOperatingSystem.ps1
7	Clean-IE.ps1
9	Set-ExplorerCommandBar.ps1
18	AddLocalUserToLocal-Group.ps1 BackupFolderToServer.ps1 Change-LocalUser-Password.ps1 CreateLocalGroup.ps1 CreateLocalUser.ps1 EnableDisableUser.ps1 FindAdmin.ps1 Get-LocalGroupMembers.ps1 Get-LocalGroups.ps1 Get-LocalUsers.ps1 Get-SystemRestore-Settings.ps1 ListUserLastLogon.ps1 LocateDisabledUsers.ps1 LocateLockedOutUsers.ps1 Remove-LocalUserFrom-LocalGroup.ps1
20	CreateShare.ps1 DeleteShare.ps1 Get-ShareInfo.ps1 GetShareAndPermission.ps1 ListAdminShares.ps1
23	FindMaxPageFaults.ps1 Get-DiskUtilization.ps1 Get-ProcessorInformation.ps1 Get-ProcessorUtilization.ps1 GetTopMemory.ps1 TroubleshootPerformance.ps1

Chapter	PowerShell Scripts
24	Get-MicrosoftUpdates.ps1 Get-MissingSoftware-Updates.ps1 Get-PercentFreeSpace.ps1 ListFreeSpace.ps1 ScanForSpecificUpdate.ps1 Start-Defrag.ps1 TroubleshootWindows-Update.ps1 UninstallMicrosoftUpdate.ps1
24	ConfigureSoftwareUpdates-Schedule.ps1 DownloadAndInstallMicrosoft-Update.ps1 Get-DefragAnalysis.ps1 Get-DiskDriveInventory.ps1 Get-LogicalDiskInventory.ps1
25	acceptPause.ps1 AutoServicesNotRunning.ps1 ChangeModeThenStart.ps1 ChangeServiceAccount-Logon.ps1 CheckServiceThenStart.ps1 CheckServiceThenStop.ps1 CountRunningServices.ps1 EvaluateServices.ps1 GetMultipleServices.ps1 getServiceStatus.ps1 MonitorService.ps1 ServiceDependencies.ps1 StartMultipleServices.ps1 StopMultipleServices.ps1
27	Test-64Bit.ps1
28	CountErrors.ps1 FindUSBEvents.ps1 Get-DiagnosticEventLogs.ps1 GetErrorsFromAllLogFiles.ps1 GetEventLogErrors.ps1

Chapter	PowerShell Scripts
29	FindPrinterDrivers.ps1 FindPrinterPorts.ps1 Get-PrinterPorts.ps1 Get-PrintQueueStatistics.ps1 Get-SharedPrinter.ps1 InstallPrinterDriver.ps1 InstallPrinterDriverFull.ps1 ListPrinterDrivers.ps1 ListPrinters.ps1 ListSharedPrintersAddPrint-Connection.ps1 TroubleshootPrinter.ps1 WorkWithPrinters.ps1

Chapter	PowerShell Scripts
30	Get-DiskPerformance.ps1 Get-PageFile.ps1 Get-VolumeDirty.ps1 Get-VolumeInventory.ps1 Get-VolumeLabel.ps1 Set-VolumeAutoCheck.ps1 Set-VolumeLabel.ps1

System Requirements

Following are the minimum system requirements necessary to run the CD:

- A Pentium 500 megahertz (MHz) or faster processor (Pentium III is recommended as a minimum).
- Microsoft Windows XP with Service Pack (SP) 3 (32-bit), Windows Vista with SP1 (32-bit or 64-bit), Windows Server 2003 R2 (32-bit or 64-bit) with MSXML 6.0 installed, Windows Server 2008 R2, or Windows 7 (32-bit or 64-bit).
- At least 24 megabytes (MB) of random access memory (RAM); 512 MB is recommended.
- A hard drive with at least 527 MB of free space.
- A CD-ROM or DVD-ROM drive.
- A mouse or other pointing device.
- A 1024 x 768 or greater monitor display.

Other options required to use all features include the following:

- A multimedia computer for sound and other multimedia effects.
- Dial-up or broadband Internet access.
- Microsoft Internet Explorer 6 or later.

Acknowledgments

If we tried to list all the people who have helped us in one way or another on this project, we'd have to add another 50 pages. So we apologize in advance to those we don't thank by name.

We'd like to acknowledge the tremendous assistance offered for the original edition by Steve Ball, Mark Russinovich, Dan Plastina, Gabe Aul, Charlie Owen, Chris Flores, and Jerry Koh of Microsoft. They are among literally dozens of developers, product managers, and technical professionals at Microsoft who enthusiastically shared their time and their deep knowledge of Windows 7 with us.

Our thanks also to their bosses, Jon DeVaan and Steven Sinofsky, for their support in making those contacts possible.

For this edition, our coverage of Internet Explorer benefited greatly from many hours of meetings with Dean Hachamovich and his team. We also owe a big thanks to the countless bloggers, Microsoft MVPs, Windows enthusiasts, and readers who shared their questions and answers with us.

The signature feature of this edition is a collection of PowerShell scripts you'll find sprinkled throughout the book. Those would not exist without the assistance of Ed Wilson, who proved to us why they call him The Scripting Guy.

Our production team was led by our longtime collaborator Curt Philips, who somehow makes this grueling process look easier each time. Technical editor Mitch Tulloch brought his own considerable expertise to the task of making sure we got the details right; he also did a fine job putting together the companion CD. We owe a big debt to John Pierce, copy-editor, and Andrea Fox, proofreader, for helping us weed out typos and grammatical errors.

Our partners and collaborators at Microsoft Press have been a source of support for many terrific years: this edition would not have been possible without the support of Jeff Koch and the superb logistical talents of project editor Valerie Woolley.

Our literary agent and good friend Claudette Moore has provided much encouragement as we've all watched the book business transform, provided excellent guidance, talked us down a few times when it was necessary, and continued to make sure that this project came together to everyone's benefit.

Thanks to one and all.

Ed Bott, Carl Siechert, and Craig Stinson
June 2011

Support and Feedback

The following sections provide information on errata, book support, feedback, and contact information.

Errata & Support

We've made every effort to ensure the accuracy of this book and its companion content. Any errors that have been reported since this book was published are listed on our Microsoft Press site:

http://www.microsoftpressstore.com/title/9780735656925.

If you find an error that is not already listed, you can report it to us through the same page.

If you need additional support, email Microsoft Press Book Support at *mspinput@microsoft.com*.

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The survey is short, and we read *every one* of your comments and ideas. Thanks in advance for your input!

Stay in Touch

Let's keep the conversation going! We're on Twitter: *http://twitter.com/MicrosoftPress*.

CHAPTER 1

What's New in Windows 7

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Organizing and Finding Files 11
Saving, Sharing, and Playing Digital Media 13
Networking in New Ways 16
Keeping Your PC Speedy and Safe 18
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WHAT has changed since we wrote the first edition of this book? For starters, PC manufacturers have sold hundreds of millions of new desktop and laptop systems running Windows 7. A few tens of millions of people have upgraded to Windows 7 from earlier versions. We've had nearly two years' worth of hands-on experience with Windows 7 ourselves—tweaking, testing, tuning, and occasionally troubleshooting, often in response to questions and comments from our readers.

Microsoft has been busy since then as well, releasing new security tools, new digital media software, and significant new releases of Internet Explorer and Windows Live Essentials—not to mention a steady stream of updates to improve the performance, reliability, and security of Windows 7. Oh, and many of those updates and hotfixes have been rolled into the first service pack, which was released in February 2011.

What's in Your Edition?

Microsoft offers Windows 7 in several editions, with a mix of features and capabilities intended for different hardware platforms, personal preferences, and business needs. In this book, we focus primarily on the three editions that you are most likely to encounter on new and upgraded PCs—Windows 7 Home Premium, Windows 7 Professional, and Windows 7 Ultimate (which is nearly identical to the Enterprise edition available for large corporate customers). A sidebar box like this one, typically placed at the beginning of each chapter, summarizes the differences in each edition as they relate to the content of that chapter. For a more detailed discussion of the differences between each edition, see Appendix A, "Windows 7 Editions at a Glance."

For recent upgraders, this is the question we hear most often: Is Windows 7 a major upgrade or just a collection of refinements? The answer depends on your starting point. If you've been using Windows Vista, the upgrade to Windows 7 should be relatively

straightforward. Windows 7 is built on the same foundation as Windows Vista, so you've already sorted out compatibility hassles with programs and devices. After you learn the basics of the revamped Windows 7 desktop and adapt to changes in search and file management, you should feel right at home.

For those who are moving to Windows 7 from Windows XP, the learning curve will be steeper. You'll find fundamental changes in nearly every aspect of the operating system, and many of the expert techniques that you've learned through the years won't work any longer. Three feature sets that were introduced in Windows Vista will be of particular interest to anyone upgrading from Windows XP:

- Search capabilities are a key part of just about every Windows task. In Windows XP, this capability is available as an add-on that installs a search box on the taskbar. In Windows 7, you'll find a search box on the Start menu, in the upper right corner of any window or dialog box based on Windows Explorer, and in Control Panel.

- For anyone obsessed with performance and troubleshooting (we suspect most of our readers fall into this group), Windows 7 includes an impressive set of diagnostic and monitoring tools. Collectively, they offer a level of detail about system events that can be eye-opening and overwhelming.

- User Account Control was one of the most controversial and misunderstood additions to Windows Vista. This feature has been greatly modified in Windows 7, but anyone upgrading from Windows XP might be surprised by the extra layer of consent dialog boxes required for some common administrative tasks, especially when settling in with a new PC.

If you've upgraded from Windows Vista, you'll notice changes throughout Windows. In most cases, these refinements fall into the "fit and finish" category. Many of the changes are subtle enough that you might not even notice them at first. Some longstanding Windows annoyances are fixed, although others remain. You'll notice that some everyday tasks require fewer keystrokes and mouse clicks, and we predict you'll see fewer warnings and notifications as you go about your daily Windows routine.

Regardless of where you come from, our goal in this book is to help you navigate through this period of transition as quickly as possible, so that you can unlearn old habits, discover new features, and become comfortable and productive with Windows 7.

In this chapter, we take you on a quick tour of noteworthy features and capabilities in Windows 7, with appropriate pointers to chapters where you'll find more detailed information and advice.

The Missing Pieces

When you upgrade to Windows 7, you might be surprised to find some familiar programs have vanished. The most notable entry on the missing-programs list is an e-mail client or news reader. Likewise, Windows 7 includes only the bare-bones Photo Viewer program. To fill in the gaps, you need to seek out Windows Live Essentials 2011 (*w7io.com/20801*). This package includes Windows Live Mail, which replaces Outlook Express in Windows XP and Windows Mail from Windows Vista. It also includes Windows Live Photo Gallery, Windows Live Messenger, and Windows Live Movie Maker, among other programs. (For more details on Windows Live Essentials, see Chapter 8, "Adding Windows Live Programs and Services.")

The other piece of software you need to add as part of your initial installation of Windows 7 is a good antivirus program. You can download a free antivirus program called Microsoft Security Essentials that works well with any edition of Windows 7, or choose from a variety of third-party options. For information on what to look for, see "Using Security Software to Block Malware" on page 617.

If you purchase a new PC with Windows 7 already installed, don't be surprised to find that it already includes Windows Live Essentials 2011 and an antivirus program (often as a feature of an all-in-one security package). As always, if you prefer a different solution you are free to replace the included software with any Windows-compatible alternative.

Introducing the Windows 7 Family

When you begin to delve into details about how Windows 7 works, the discussion can quickly become complicated. The primary reason for confusion is that the operating system is actually distributed and sold in multiple editions. The lineup of available editions is less complicated than for Windows Vista, but you can still get tripped up if you read about an advanced feature and don't realize that it's missing from your edition.

How can you tell which Windows 7 edition is installed on your PC? The easiest way is to look at the top of the System window in Control Panel—click System in Control Panel; right-click the Computer icon on the Start menu and then click Properties; click Computer on the Start menu and then click System Properties on the command bar; or use the keyboard shortcut Windows logo key+Break. Under the Windows Edition heading, you will see the current installed edition, as shown in Figure 1-1.

Figure 1-1 System in Control Panel shows which Windows 7 edition is installed. It also lets you see whether a service pack has been installed.

In this book, we concentrate on the three Windows 7 editions you are most likely to encounter on a mainstream home or business PC:

- **Windows 7 Home Premium** This is the edition you are most likely to find installed on a new PC in the computer section at your local warehouse store or consumer electronics specialist. It includes roughly the same mix of features as its predecessor, Windows Vista Home Premium.

- **Windows 7 Professional** This edition is the successor to Windows Vista Business and incorporates the same features as that operating system, notably advanced networking features that work with networks based on the Windows Server family. In a noteworthy change, however, Windows 7 Professional is a superset of Home Premium and thus includes all features (including Windows Media Center) found in the lesser edition.

- **Windows 7 Ultimate** and **Windows 7 Enterprise** These editions are essentially identical, with the names reflecting the sales channel of each: Ultimate is available on retail and original equipment manufacturer (OEM) editions; Enterprise is available as an upgrade only to customers who buy volume licenses of Windows. This edition contains all features found in the Home Premium and Professional editions plus some advanced networking features, BitLocker encryption, and support for multiple languages. The Enterprise edition includes some additional usage rights available in the volume license agreement.

All of these editions are available in x86 (32-bit) and x64 (64-bit) options. When we wrote the previous edition of this book, 64-bit Windows was still a fairly exotic choice for most Windows users. Within just a few years, thanks in no small measure to the plummeting price of memory chips, that balance has shifted dramatically. Today, 64-bit Windows 7 is commonly installed on new computers, especially on systems with 4 GB or more of RAM.

Note

The default settings we describe in this book are those you will see if you perform a clean install of Windows 7 using a shrink-wrapped retail copy. If you purchase a new PC with Windows 7, your settings might be different. Computer manufacturers have the right to customize Windows when they install it on a new system; they can change default settings, customize desktop backgrounds and screen savers, tweak the home page and Favorites list in Internet Explorer, install third-party software, and configure the system so that it uses a different media player or browser than the Windows 7 default settings.

In this book, we offer only limited coverage of two specialized Windows 7 editions:

- **Windows 7 Starter** This edition is available for sale only on low-powered hardware, such as lightweight "netbooks," and is limited in its feature set.

- **Windows 7 Home Basic** Although its predecessor was available worldwide as the entry-level edition of Windows Vista, Windows 7 Home Basic is available only in emerging markets and is not authorized for sale in the United States, Western Europe, and the rest of the so-called developed world. It lacks support for the Aero interface and does not include Windows Media Center.

We also ignore the handful of variations of standard Windows 7 editions that have been modified to satisfy terms dictated by courts in various parts of the world. We never heard from a single reader who actually used the N or K versions of Windows Vista, which had Windows Media Player removed and were offered for sale in Europe and Korea, respectively. Windows 7 offers similar packages, and our experience suggests they have been equally unpopular, if not completely invisible.

Adjusting to the Windows 7 Interface

The basic building blocks of the Windows interface have remained unchanged for years, with only relatively minor tweaks to break the familiar routine. With Windows 7, those familiar pieces get the biggest makeover they've had since the turn of the century. In this section, we present a whirlwind tour of the Windows 7 desktop; you'll find more details (and our exclusive Inside Out advice on how to tweak things to match your preferences) in Chapter 4, "Personalizing Windows 7."

The basic layout of the Windows taskbar is the same as it has been for more than a decade: a Start button on the left side, a clock and some small icons on the opposite side, and room in between for buttons that represent programs.

By default, those taskbar buttons are noticeably bigger than the ones you're accustomed to from earlier Windows versions. They also serve a dual purpose: to start up programs and to switch between running application windows. You can pin program shortcuts to the taskbar so that they're always available (even when the program they represent isn't running) and drag buttons left or right to reorder them.

When you move your mouse over a taskbar button that represents a running program, the Aero interface shows you a live thumbnail preview of every window associated with that button. Hover the mouse over a preview, and a nifty new feature called Aero Peek hides other windows to show you only the one you've highlighted. Move the mouse away from the preview, and Windows restores your desktop.

For programs that support lists of recently opened files, you can right-click to display a Jump List, like the one shown in Figure 1-2. You can "pin" frequently used items to this list as well so that they're always available. If Internet Explorer 9 is installed, you can also create shortcuts to individual websites and pin them to the taskbar.

Every Windows user has, at some point in their computing lifetime, watched in horror as the number of icons in the notification area rose to double digits and threatened to overwhelm the rest of the taskbar. In Windows 7, notifications are hidden by default. You can customize individual notifications so that they're always visible, or click the arrow to the left of the visible icons to reveal and work with the collection of hidden icons. In the Notification Area Icons dialog box (shown in Figure 1-3), you can adjust each icon's behavior individually or use the links at the bottom of the dialog box to globally change the appearance and behavior of this area.

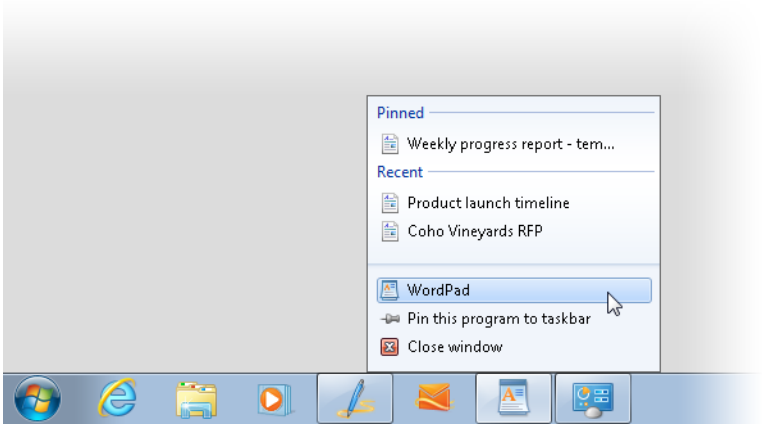


Figure 1-2 Jump Lists give you easier access to documents you've opened recently. With Internet Explorer 9 installed, you can also pin shortcuts for websites to the taskbar, like the shortcut to Hotmail, the third one from the right.

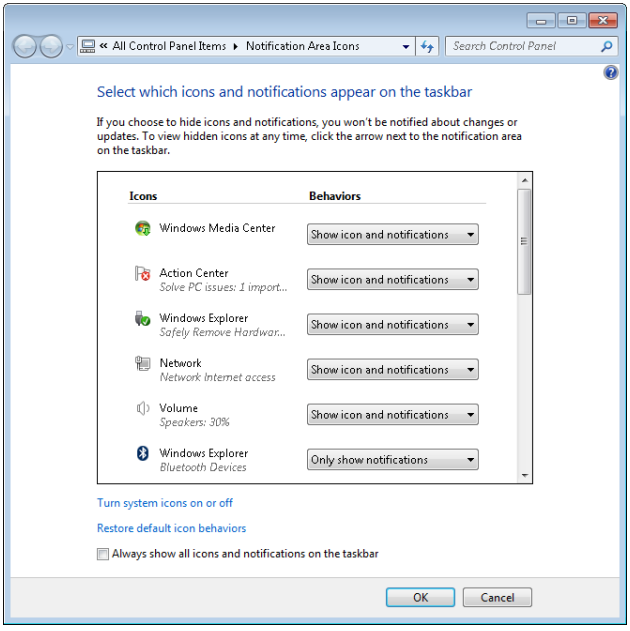


Figure 1-3 Use the Notification Area Icons dialog box to adjust the behavior of every icon in the notification area.

Arguably, personalizing the Windows environment with custom desktop backgrounds, sounds, and screen savers has only a minor impact on productivity. But those tweaks are still psychologically important. In Windows 7, the entire collection of personalization settings is consolidated in a single dialog box, shown in Figure 1-4.

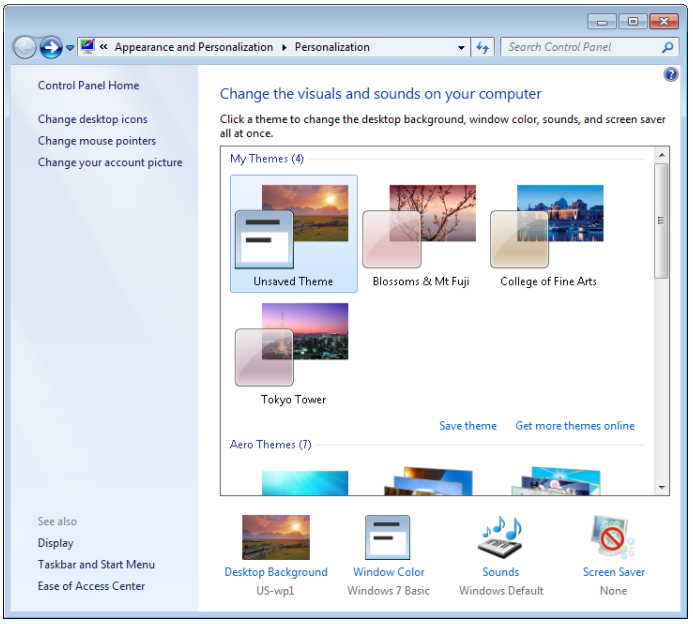
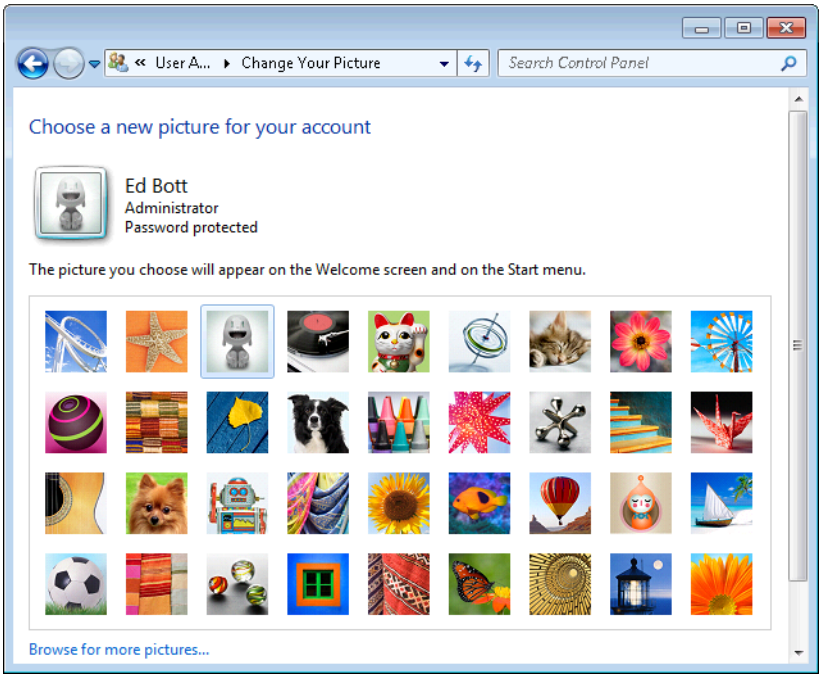


Figure 1-4 In Windows 7, all personalization options are consolidated in a single control panel.

If you dig deep enough into the many categories under the Personalization heading in Control Panel, you'll find a large and interesting selection of desktop backgrounds, which can be chained together into sets that refresh automatically at intervals you specify, plus new sound schemes and even an expanded collection of pictures that identify your user account, as shown next. You'll find our Inside Out advice on how to master the full range of personalization options in Chapter 4.



And finally, Windows 7 refines the concept of gadgets. These minimalist programs perform simple tasks such as displaying a clock or your favorite pictures in a small desktop window, retrieving RSS feeds, or monitoring CPU and network activity. In Windows Vista, gadgets reside by default in the sidebar and have to be dragged manually to the desktop. In Windows 7, gadgets float on the desktop at all times. Although the host process is still Sidebar.exe, the confining sidebar itself is gone, and a simple keyboard shortcut (Windows logo key+G) allows you to temporarily move all running gadgets to the top of the desktop, above any program windows, for easy reference.

Organizing and Finding Files

Over the years, Windows Explorer has evolved dramatically. In its earliest incarnation, it was a simple file browser to make it easier to traverse hierarchical directories on hard drives without having to use DOS commands. Today, Windows Explorer is a full-featured shell that helps you manage practically every aspect of the operating system. It still functions as a file manager, but old-timers might be surprised to note that drive letters and folder trees are de-emphasized in Windows 7, in favor of a navigation system that emphasizes a new file-organizing feature called *libraries*.

The concept behind libraries can be confusing, especially if you're accustomed to navigating through the traditional Windows Explorer folder tree. A library is a virtual folder that contains links to actual folders located on your system or on a network. When you view a library in Windows Explorer, the contents pane displays every file and folder contained in the locations that are a part of that library. You can search this unified view, filter it, or display it using sorting and grouping that is appropriate to the type of data contained in that library. As part of a default installation, Windows 7 sets up four libraries: Documents, Music, Pictures, and Videos. Figure 1-5 shows the Pictures library with one additional local folder added to it.

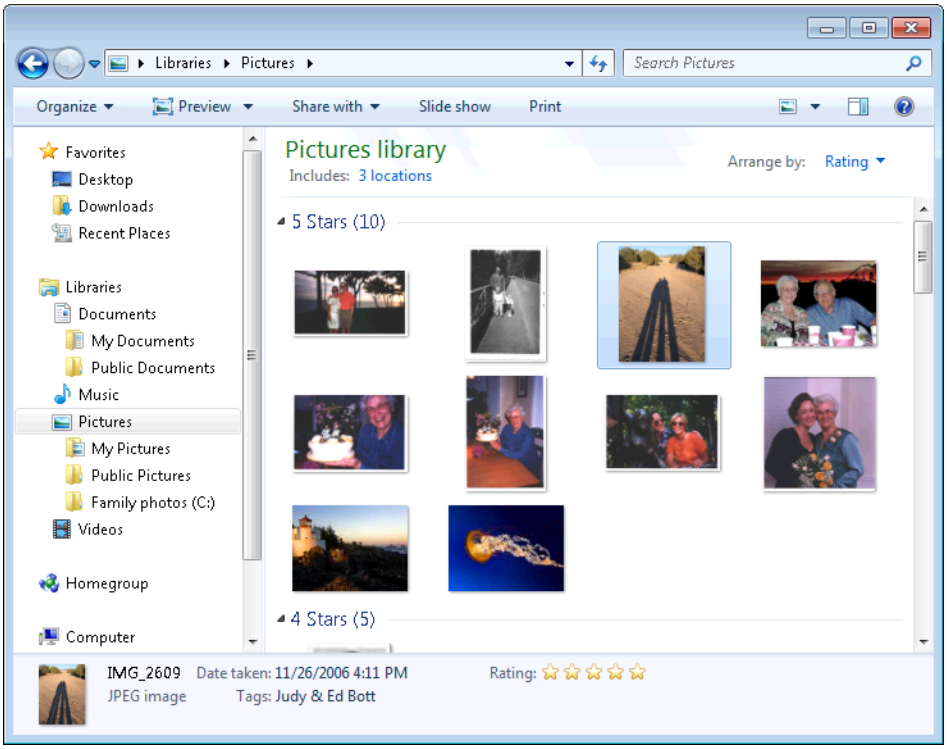


Figure 1-5 Libraries present a unified view of data files stored in multiple locations, allowing you to search, filter, sort, and group the entire collection.

The other major change in Windows Explorer is its excellent support for indexed searches, which can seem practically magical when you're looking for one particular document on a hard drive filled with thousands of files. Windows 7 removes many of the form-based, fill-in-the-blank, "select this check box" search tools that you might have learned to use in Windows XP or Windows Vista. Instead, context-sensitive options in the search box help you refine a search, as the example in Figure 1-6 shows.

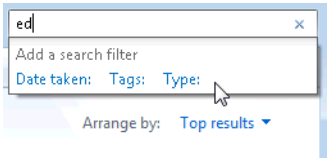


Figure 1-6 Enter free-form text in a search box to filter the contents of a library or folder, and then click to refine the search further using these filters.

Mastering Windows Explorer is a crucial stop on the way to becoming a Windows expert. That's why, in this edition, we devote two full chapters to the topic. Chapter 9, "Organizing Files and Information," introduces the building blocks of Windows Explorer, including a detailed discussion of libraries, metadata, and basic search techniques. In Chapter 10, "Using Windows Search," we document the powerful but sometimes arcane Windows Search syntax and provide examples of its effective use.

Saving, Sharing, and Playing Digital Media

These days, practically all of the media we consume is digital. Digital cameras have almost completely eliminated film, and more music is downloaded (legally or otherwise) than is sold on CDs. Even movies and TV are increasingly being delivered to your home as a stream of bits rather than on a shiny disc.

The natural hub for managing all these media files is a PC. In this book, we cover two full-featured tools included with Windows 7 that allow you to manage, play, and share digital music, movies, and photos: Windows Media Player and Windows Media Center. For this edition, we also add coverage of the Zune software, which provides a slick and modern alternative for managing and playing a music and video collection.

> **Note**
>
> **As we noted earlier in this chapter, some digital media tools previously included as a part of earlier Windows versions are not included with Windows 7. On a clean installation of Windows 7, for example, you can import pictures from a digital camera and view them using Windows Explorer or Windows Photo Viewer. To edit those imported photos, however, you must use Windows Live Photo Gallery (part of Windows Live Essentials 2011) or third-party software.**

Windows Media Player 12 is the latest incarnation of the core media manager/player program included in Windows. It's superficially similar to its predecessors in layout—with a navigation pane on the left side, a contents pane in the center, and tabs on the right for

displaying lists of items to be played, synced, or burned to CD or DVD. Figure 1-7 shows Media Player in operation, with a selection of songs queued up and ready to play.

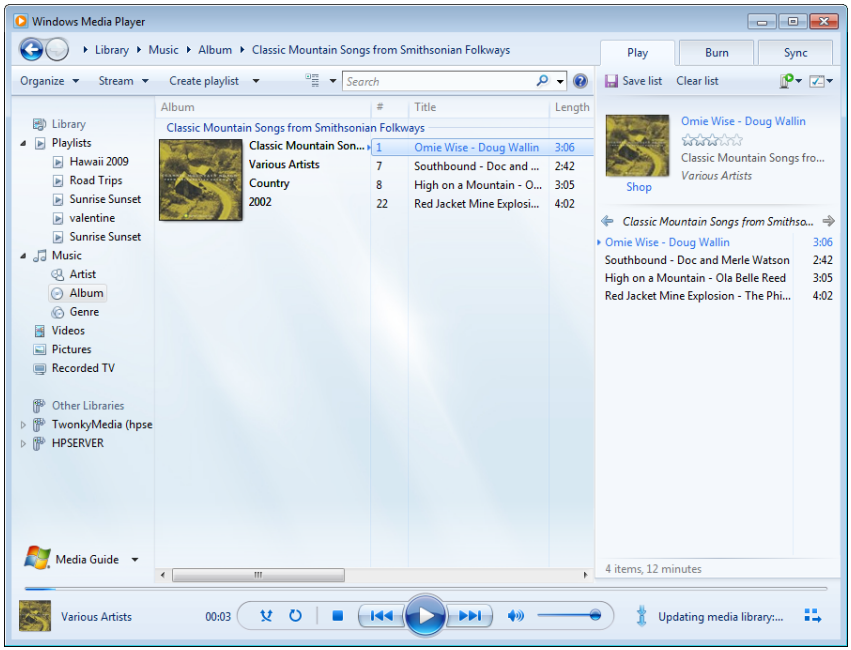


Figure 1-7 The default three-pane layout of Windows Media Player.

Most simple tasks in Windows Media Player work without any customization. If you double-click an album in the library, it begins playing through the default playback device (normally, your PC's speakers). When you insert a DVD, the player starts, switches to full-screen mode, and begins playing back the movie immediately.

What's new in Windows Media Player 12? The most significant change is one you might not notice immediately: the player now supports playback of additional file types, including standard and high-definition movies recorded on digital cameras and saved in H.264 and AVC formats. If you previously had to install a third-party package such as Apple's QuickTime to play back those movies, you'll be pleasantly surprised to find that you can now play them using Windows Media Player.

The other significant new digital-media feature in Windows Media Player 12 is the ability to stream media between devices on a Windows network. After you enable this capability, you can select a remote device (such as the Xbox 360 shown in Figure 1-8) and use the Play To menu to send the contents of a playlist from your Windows 7 PC to that device over the network.

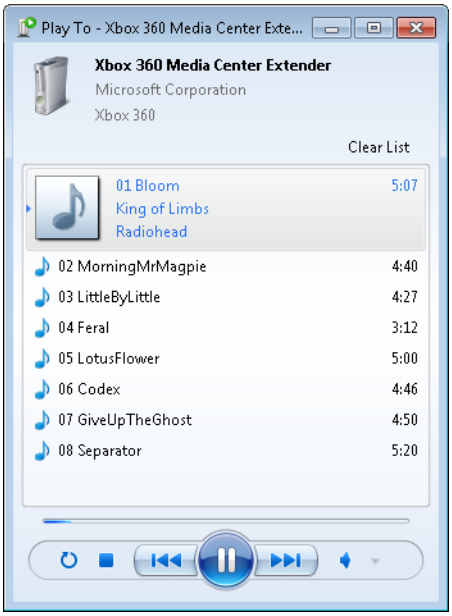


Figure 1-8 Use the media-streaming capabilities in Windows Media Player 12 to send digital music or movies from a PC to another device over your network.

We explain the fundamentals of building, maintaining, and enjoying a library of music and movies in Chapter 13, "Playing and Organizing Digital Media Files." For step-by-step instructions on how to set up and use media streaming, check out Chapter 14, "Sharing and Syncing Digital Media."

The other major media program in Windows 7 is Windows Media Center. For playing back media files, it shares much of the code from Windows Media Player. (One major capability that Media Center has that is not in Media Player is the ability to record TV from a TV tuner device.) Media Center uses what is known as a 10-foot interface, designed to be used in a living room with a remote control (although it's quite functional on a laptop or desktop PC as well). For more details about how to build your own media hub, see Chapter 15, "Using Windows Media Center."

For this edition, we've added an entirely new chapter for digital media fanatics. In Chapter 16, "Digital Media for Enthusiasts," we cover the nuts and bolts of using a PC in the living room, how to make best use of an Xbox 360 console on a PC network, how to master the Zune software, and how to manage tags and convert digital media file formats.

Networking in New Ways

In Windows Vista, Microsoft introduced the Network And Sharing Center as the one place to go for most network-related tasks. The concept annoyed some longtime Windows users, who discovered that common network tasks they had learned to accomplish with simple shortcuts in Windows XP now required extra clicks or keystrokes.

The Windows 7 Network And Sharing Center (shown in Figure 1-9) gets a usability overhaul designed to reduce clutter and make common tasks easier to find.

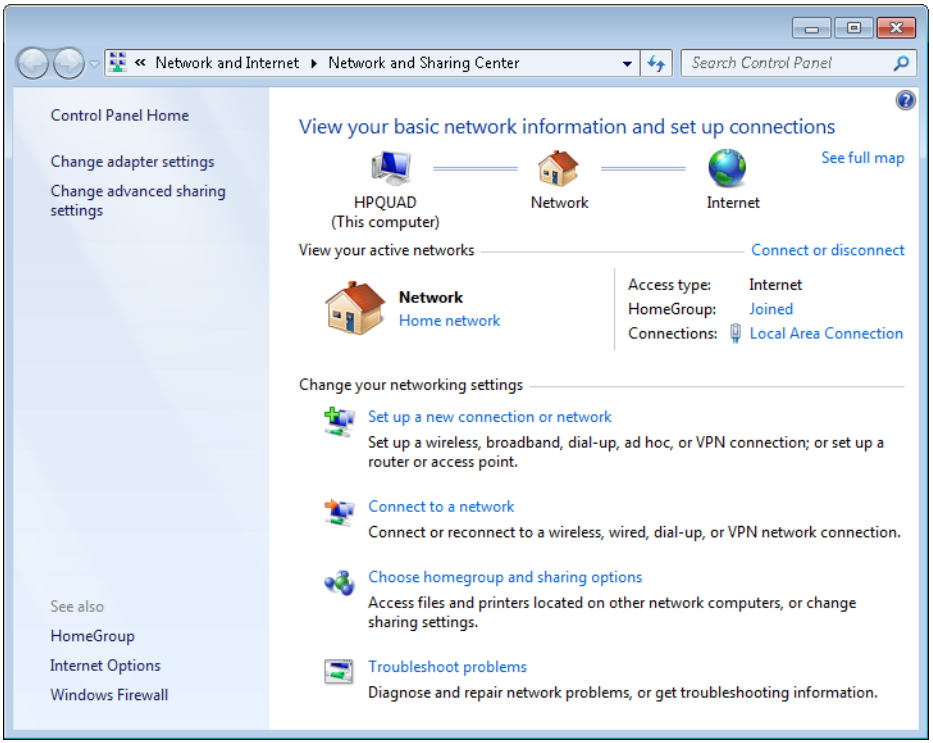


Figure 1-9 Most common networking tasks are accessible within a click or two of the Network And Sharing Center.

If you're accustomed to networking in Windows XP, you have a lot of catching up to do. In the networking section of this book, we explain how Internet Protocol version 6 (IPv6) and Internet Protocol version 4 (IPv4) work together, for example, and how the Link Layer Topology Discovery subsystem helps you build a visual map of your network. Networking changes that are new in Windows 7 include a much-improved interface for connecting to wireless access points.

The most significant addition to the networking capabilities in Windows 7 is the HomeGroup feature, which allows two or more computers running Windows 7 to share files and printers and stream media without the hassle of managing individual user accounts and permissions. Figure 1-10 shows the interface for managing shared files in a homegroup.

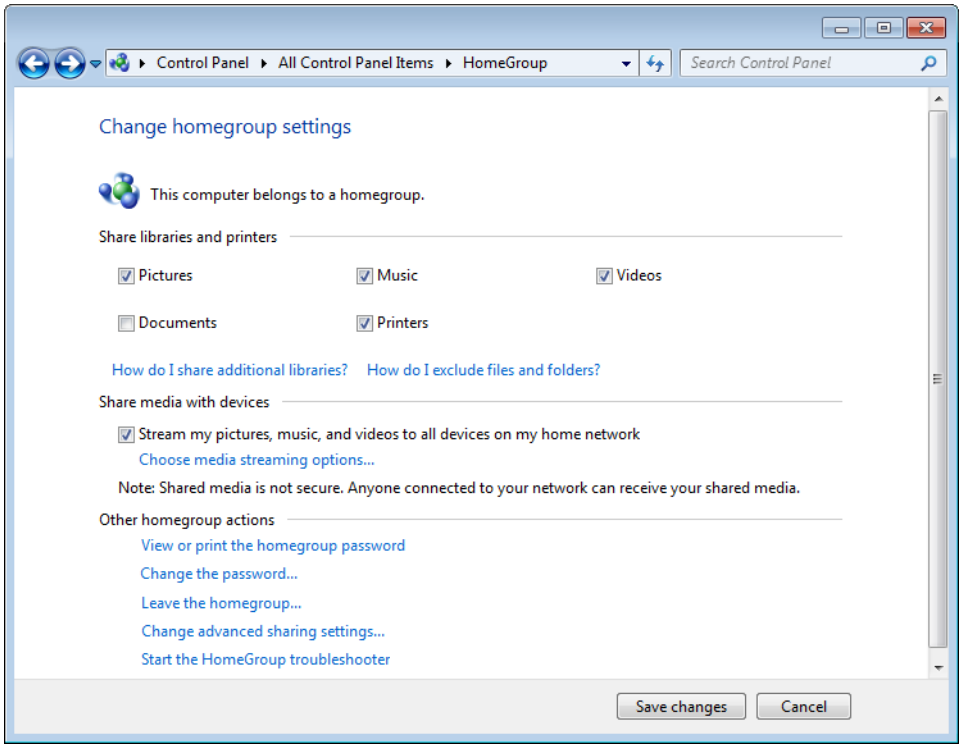


Figure 1-10 The HomeGroup feature offers a simplified interface for sharing files, printers, and digital media between computers running Windows 7.

If your network includes computers running earlier versions of Windows, you need to set up shared access by using more traditional techniques. The differences from Windows XP–based networks are profound. You can specify different levels of security for sharing, and on individual files and folders stored on NTFS volumes, you can specify which accounts and groups, if any, are allowed to access those files.

Our coverage of Windows 7 networking begins in Chapter 19, "Setting Up a Small Office or Home Network."

Keeping Your PC Speedy and Safe

The secret of remaining happy and productive with Windows, day in and day out, is to ensure that the system runs at peak performance, with no unexplained hangs or crashes to interrupt work or play. We know from talking to Microsoft developers that they made many kernel-level changes that collectively make Windows 7 feel faster than its predecessors. But that still leaves plenty of room for tweaking and, inevitably, troubleshooting. Fortunately, Windows 7 includes excellent tools for helping you monitor performance, diagnose balky programs and hardware, and fix problems when they occur.

The most noteworthy addition to the Windows 7 system-management toolkit is the Action Center. It consolidates messages, troubleshooting tools, and basic system-management functions in a single location. You can access it from its ever-present icon in the notification area or from the System And Security heading in Control Panel. Figure 1-11 shows a pair of security and maintenance messages, which are color-coded on your screen as red or yellow to indicate the level of importance.

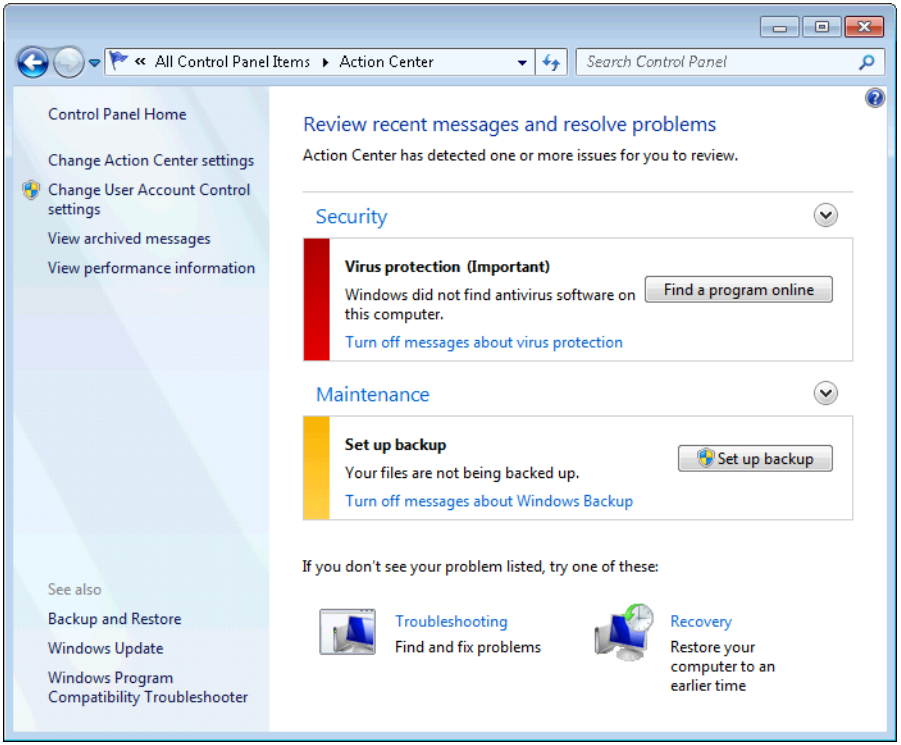


Figure 1-11 Click the down arrow to the right of the Security and Maintenance headings to see more messages.

We cover the ins and outs of Action Center and its companion tools in Chapter 24, "Performing Routine Maintenance."

When you're trying to troubleshoot problems such as application crashes or hardware failures, it's useful to have a log of important events. That's the function of the new Reliability Monitor, shown in Figure 1-12. It plots important system events, such as successful and unsuccessful installations of drivers and software as well as application crashes, on a timeline. By filtering the timeline to a specific day or week, you can identify individual events that might provide important clues to the cause of a problem.

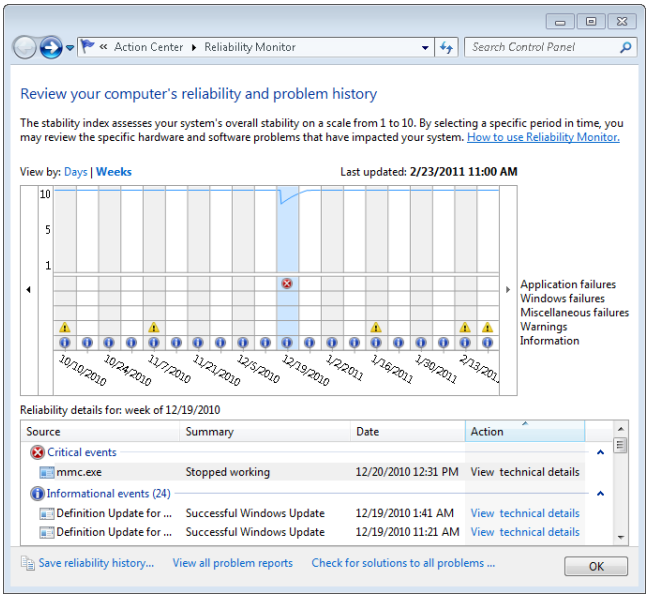


Figure 1-12 Reliability Monitor provides a convenient timeline of critical events and changes to your system configuration.

Finally, there's Resource Monitor, which debuted in Windows Vista but has been significantly enhanced for Windows 7. The amount of technical detail available here—covering CPU load, memory usage (shown in Figure 1-13), disk activity, and network performance—can be overwhelming, at least initially. We explain how to filter the useful information from the noise in "Monitoring Performance in Real Time" on page 841.

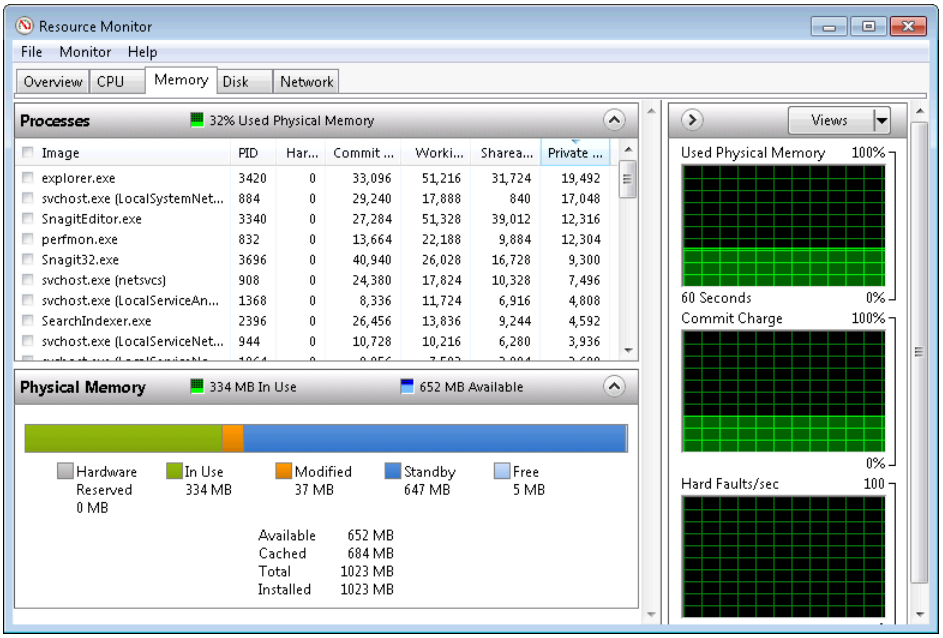


Figure 1-13 Resource Monitor displays in-depth information about every major aspect of system performance.

Using Internet Explorer 9

Windows 7 includes Internet Explorer 8 as its default program for browsing web pages and displaying HTML-formatted content. Even if you're new to Windows 7, you're probably already familiar with the features in Internet Explorer 8, which has been available as an upgrade for Windows XP and Windows Vista since early 2009.

In 2011, after a long public beta test, Microsoft released Internet Explorer 9, which is available as an upgrade for Windows Vista and Windows 7. Unless you have a compelling reason to continue using Internet Explorer 8, we strongly recommend upgrading. When you do, here's what you get:

- **Performance** Internet Explorer 9 is able to tap into the graphics processing unit (GPU) on a modern PC and use its considerable horsepower to assist in displaying graphics. Other areas of the browser received extensive attention from developers to improve speed and responsiveness as well. If you thought previous versions of Internet Explorer were sluggish, you might be pleasantly surprised by this one.

- **Security** In Windows Vista, Microsoft introduced the concept of Protected Mode browsing, which provides a significant layer of protection from potentially hostile

web pages, scripts, and downloads. That architecture is present in Windows 7 as well, along with a host of new security features such as a SmartScreen filter that blocks known sources of dangerous code. Internet Explorer 9 includes a major new set of Tracking Protection tools that give you fine-grained control over your privacy, as shown in Figure 1-14.

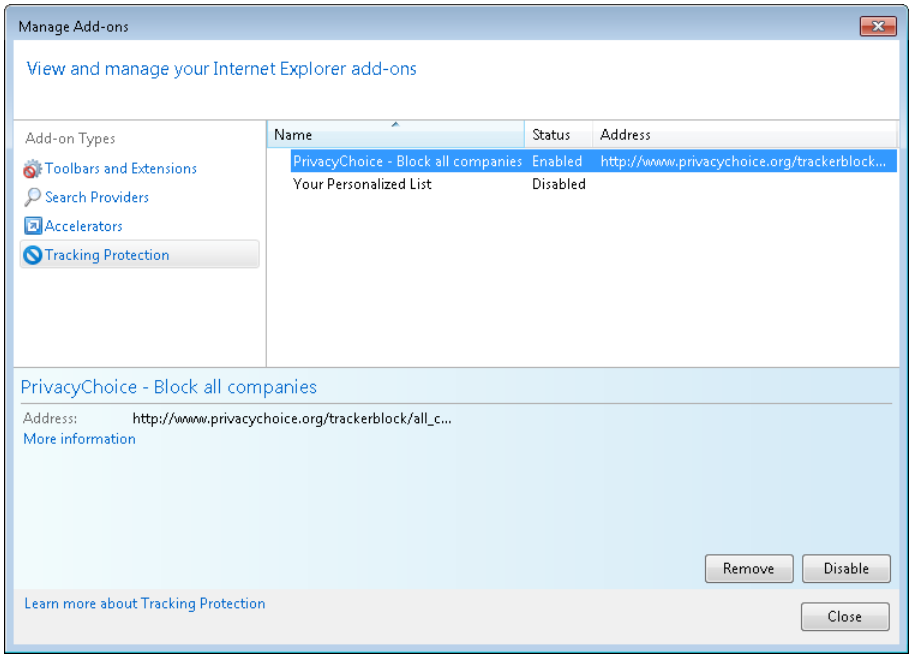


Figure 1-14 By adding a Tracking Protection list and enabling it, you can block websites that try to build a profile of you based on your online activities.

- **Usability** What's most notable about the Internet Explorer 9 interface is what's missing. The address bar and search box have been combined. Toolbars, menus, and buttons are hidden. The window frame is thinner, and there's no text at all in the title bar. The overall effect is that the browser recedes into the background, allowing the website itself to take center stage. In addition, you can pin a website to the taskbar and return to that site (or a group of sites) with a single click.

- **Compatibility** Over the years, Internet Explorer has earned its share of brickbats from web designers, who complained that it ignores web standards and requires custom code to handle its many design and layout quirks. By contrast, Internet Explorer 9 was designed to conform to modern web standards. The changes in both Internet Explorer 8 and 9 are so sweeping, in fact, that you might experience problems properly displaying pages that were tweaked to display properly in earlier versions

(especially Internet Explorer 6). We explain why formatting glitches occur and list the full range of solutions in "Dealing with Compatibility Issues" on page 248.

Internet Explorer is a large and complex program—so big, in fact, that it deserves two chapters in this edition. If you choose to use it as your default browser, you'll benefit greatly from a close reading of Chapter 6, "Using Internet Explorer," and Chapter 7, "Internet Explorer Compatibility, Security, and Privacy."

Updating to Service Pack 1

In February 2011, Microsoft officially released Windows 7 Service Pack 1. This package consolidates previously released updates for system reliability, program compatibility, and security into a single package. For a comprehensive listing of all included updates, see Appendix C, "Fixes Included in Windows 7 Service Pack 1." For more information about service packs in general, including links to the latest release for a specific Windows version, see Microsoft's official Service Pack information page at *support.microsoft.com/sp*.

You don't need to do anything special to update your system to Service Pack 1. For homes and small businesses, Windows Update handles this task automatically, downloading a relatively small update file and installing it as part of your regular update routine. No intervention is required on your part.

If you're an IT professional setting up one or more new PCs for the first time, check the installation media you're using. Packages manufactured after the release of Service Pack 1 should contain the necessary files already integrated into the setup DVD. If you're using an original Windows 7 disc, you can download the service pack files and "slipstream" them into an installation image for deployment in your organization. See Chapter 26, "Deployment and Migration," for details.

CHAPTER 4

Personalizing Windows 7

Working with the New Taskbar and Start Menu 112
Personalizing the Taskbar and Start Menu 121
Mastering Window Management with Windows 7 Tricks 134
Personalizing Theme Elements: Visuals and Sounds . . . 138
Configuring Your Display 154
Using and Customizing Desktop Gadgets 160
Setting Power and Sleep Options 162
Working with Fonts 166
Adjusting Ease of Access Options 167

One of the most obvious changes that Microsoft made in moving from Windows Vista to Windows 7 is the taskbar, which has a bold new look, lots of new functionality, and new ways to customize, all of which we explain in this chapter. We also cover the many new techniques that make it easier to perform various window tasks, such as maximizing, resizing, and so on.

A subtler change is the inclusion of the word *Personalize* prominently in the user interface of the new operating system. Certainly, earlier versions of Windows could be tailored, customized, and modified to suit a user's needs and preferences—in a word, personalized. But the *P* word itself was missing. Now, when you right-click your desktop, the shortcut menu that pops up features an icon-festooned Personalize command. Personalize Windows is also one of the items that appear in the new operating system's Getting Started task list.

So the message is clear: It's your operating system; make it reflect your tastes, your needs, your style. Make it work for you. More than any previous version of Windows, Windows 7 provides myriad tools for doing just that—tools that we survey in this chapter.

What's in Your Edition?

The ability to personalize your computing environment by changing desktop backgrounds, window colors, and sounds is not available in Windows 7 Starter edition. Lack of Aero support in Starter edition means you can't get transparent window frames, live taskbar previews, and other visual effects, and Aero Peek is unavailable. And Starter edition does not support the use of multiple monitors. All other features described in this chapter are available in all editions.

Working with the New Taskbar and Start Menu

The *taskbar* is that strip of real estate along one screen edge (bottom by default) that contains the Start menu button, program buttons, and status icons. The taskbar made its first appearance in Windows 95. In the years since, it has slowly evolved: installing Internet Explorer 4 in Windows 95 also added a Quick Launch toolbar and other toolbars; Windows XP reduced clutter by introducing taskbar grouping; and Windows Vista added taskbar previews, small window representations that increased your chances of clicking the correct taskbar button for the program you wanted to bring to the front.

The evolution continues in Windows 7, but at a generation-skipping pace. The Windows 7 taskbar (see Figure 4-1) continues to serve the same basic functions as its progenitors—launching programs, switching between programs, and providing notifications—but in a way that makes these basic tasks easier and more efficient.

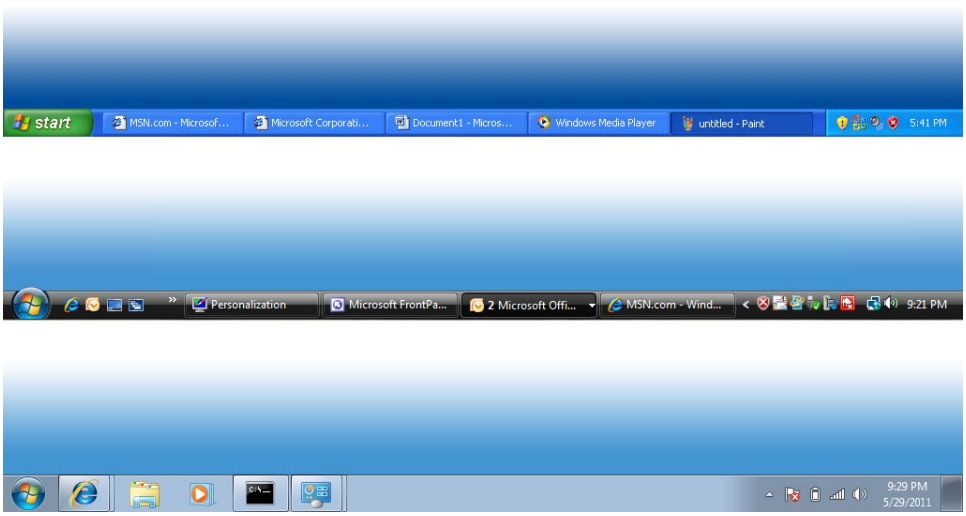


Figure 4-1 Although the taskbar designs in Windows XP (top), Windows Vista (center), and Windows 7 (bottom) contain the same basic elements, the appearance has evolved a bit—and the functionality has advanced by leaps and bounds.

Opening and Monitoring Programs from Taskbar Buttons

As in previous Windows versions, the taskbar houses the Start menu button, a button for each running program, and the notification area. You can use these task buttons to switch from one running program to another. You can also click a task button to minimize an open window or to restore a minimized window. But in a departure from earlier Windows

versions, which had separate bands dedicated to a Quick Launch bar (from which you can open programs) and to taskbar buttons (which represent programs that are currently running), the Windows 7 taskbar combines these functions. That is, buttons between the Start button and the notification area can be used both for opening programs and for switching between programs.

Adding and Removing Pinned Programs, Documents, and Folders

Programs that you use often (the ones that you might've had on the Quick Launch toolbar in the past) can be easily pinned to the taskbar so that a single click launches them. To open a program that is pinned to the taskbar, you don't need to open the Start menu or dig down to find a desktop shortcut. To pin a program to the taskbar, simply drag its icon or a shortcut (from the desktop, from the Start menu, or from any other folder) to the taskbar. Alternatively, right-click a program icon wherever you find it and choose Pin To Taskbar.

To remove a pinned program from the taskbar, right-click the pinned icon and choose Unpin This Program From Taskbar. This command also appears on other shortcuts to the program, including those on the desktop and on the Start menu.

You can also pin frequently used documents and folders to the taskbar by using similar methods:

- To pin a document to the taskbar, drag its icon or a shortcut to the taskbar. If the taskbar already has a button for the program associated with the document, Windows adds the document to the Pinned section of the program's Jump List. (For more information about Jump Lists, see "Using Jump Lists on the Taskbar and Start Menu" on page 119.) If the document's program is not on the taskbar, Windows pins the program to the taskbar and adds the document to the program's Jump List.
- To pin a folder to the taskbar, drag its icon or a shortcut to the taskbar. Windows adds the folder to the Pinned section of the Jump List for Windows Explorer.
- To open a pinned document or folder, right-click the taskbar button and then click the name of the document or folder.
- To remove a pinned document or folder from the Jump List, right-click the taskbar button and point to the name of the document or folder to be removed. Click the pushpin icon that appears.

INSIDE OUT

Restore the Quick Launch toolbar

Some habits die hard. If you just can't bear to give up the Quick Launch toolbar, you can display it in Windows 7. To do so, add the hidden Quick Launch folder as you would any other folder. (For details, see "Using Additional Toolbars" on page 124.) In the New Toolbar dialog box, type %AppData%\Microsoft\Internet Explorer\Quick Launch in the Folder box.

To mimic the appearance of the Quick Launch toolbar in previous Windows versions, unlock the taskbar. (Right-click the taskbar and, if there's a check mark by Lock The Taskbar, choose that command.) Right-click the Quick Launch toolbar and clear the Show Title and Show Text commands. Then drag the handle (the dotted line) on the left side of the Quick Launch toolbar so that it's next to the Start button, and drag the handle on the right side of the toolbar to set the width you want. Then relock the taskbar.

If you later decide you don't need the Quick Launch toolbar after all, right-click the taskbar and select Toolbars, Quick Launch to remove the check mark and the toolbar.

Opening Programs

To open a program, click its taskbar button. A few simple (but not obvious) tricks let you do more:

- To open a new instance of a program, Shift+click its taskbar button. This is useful for programs that are already running, for which an ordinary click switches to the existing instance or, if you already have multiple open instances, displays the window thumbnails. (If you have a wheel mouse or other three-button mouse, middle-click serves the same purpose as Shift+click.)
- To open a new instance with administrative privileges, Ctrl+Shift+click a taskbar button.

Switching Tasks

When you open a pinned program, the appearance of its taskbar button changes to indicate that the program is running, as shown in Figure 4-2. The icon for a running program has a buttonlike border, and when you mouse over the button, the background color becomes similar to the program's window colors. A program that has more than one window or tab open appears as a stack of buttons. Opening other programs adds a button for each program to the taskbar.

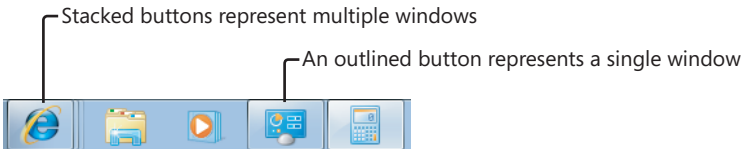


Figure 4-2 Taskbar buttons for programs that are not running have an icon but no border and share the same background as the taskbar itself.

As in previous Windows versions, you can switch to a different program by clicking its taskbar button. Much of the guesswork required to pick the correct taskbar button in previous versions is gone in Windows 7, however. Now, when you hover the mouse pointer over a taskbar button, a thumbnail image of the window appears next to the taskbar button. If a taskbar button represents more than one window (because the program has multiple open windows), hovering the mouse pointer over the taskbar button displays a preview of each window.

Still not sure which is the correct window? Use another new Windows 7 feature, *Aero Peek*. Hover the mouse pointer over one of the preview images, and Windows brings that window to the fore and indicates the location of all other open windows with outlines, as shown in Figure 4-3.

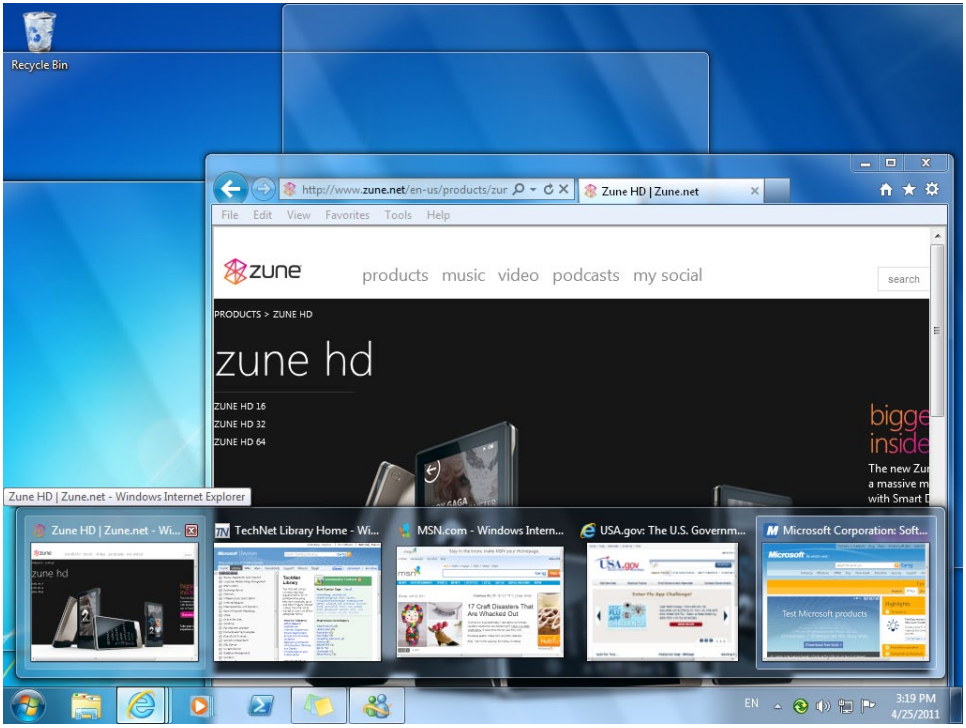


Figure 4-3 Aero Peek makes it easy to see the contents of a window, even when it's buried among a stack of open windows.

Note

Taskbar preview images and Aero Peek are available only when you use an Aero theme. (For more information about Aero and themes, see "Understanding and Using Windows Aero" on page 139.) If you're not using an Aero theme, hovering the mouse pointer over a taskbar button displays each window's full title.

When the preview (or the title bar, if you're not using Aero) of the window you want is displayed, simply click that preview to switch to that window. You also have the option of closing a window by clicking the red *X* in the upper right corner of the preview or by middle-clicking anywhere in the preview image. Other basic window tasks are available on the context menu that appears when you right-click the preview image.

INSIDE OUT

Use shortcut keys for taskbar buttons

The first 10 taskbar buttons are accessible by keyboard as well as by mouse. Press Windows logo key+1 for the first, Windows logo key+2 for the second, and so on (using 0 for the tenth). Using one of these shortcuts is equivalent to clicking the corresponding taskbar button: if the button's program isn't running, it starts; if it has a single open window, you switch to that window; if it has multiple open windows, Windows displays previews of all windows and a "peek" view of the first window.

Note that you can move taskbar buttons, which therefore determines the key number that opens a particular icon. To move a taskbar button, simply drag it to the location you want.

Another useful shortcut key is Windows logo key+T, which brings focus to the first item on the taskbar, as indicated by a faint glow at the bottom of that taskbar button. At that point, you can repeatedly press Windows logo key+T, Shift+Windows logo key+T, or the arrow keys to select other taskbar buttons. When a taskbar button is selected, you can press Spacebar to "click" the button, press the Menu key to display its Jump List, or press Shift+F10 to display its context menu.

As you use Windows 7, you'll notice other enhancements to the taskbar. Some taskbar previews do more than simply show a thumbnail image of the window; for example, the preview for Windows Media Player includes basic player controls (Previous, Pause/Play, and Next). And with some taskbar buttons, you don't even need to display a preview to know what's going on with the program; windows or dialog boxes that show a progress bar, for example, indicate their progress with a colored background in the taskbar button itself.

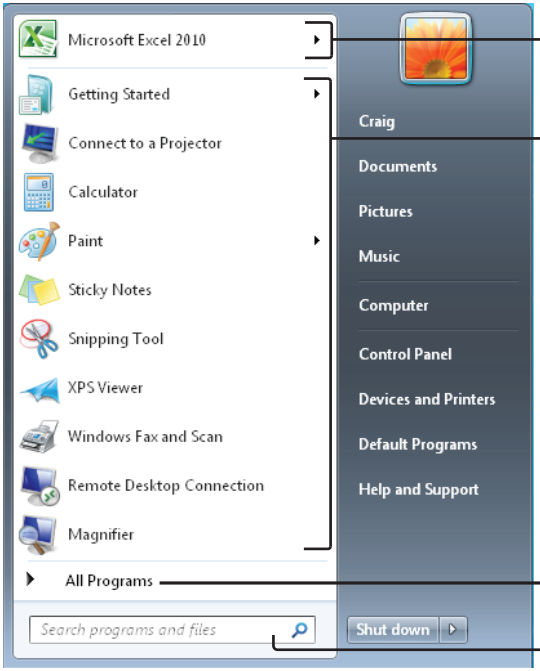
INSIDE OUT

Use Ctrl+click to cycle through windows

If you're not using Aero, you don't get thumbnail previews and you can't use Aero Peek to view full-size windows or tabs before you switch to them. However, if you hold down the Ctrl key while you click a taskbar button that represents a group of windows, you'll see each window in turn. Release the Ctrl key when you see the one you want.

Opening Programs from the Start Menu

Although improvements to the taskbar in Windows 7 have reduced the number of necessary trips to the Start menu (shown here), the Start menu continues to provide access to nearly everything you need to do in Windows.



Like the default Start menu in Windows XP and Windows Vista, the Windows 7 Start menu is a two-column affair, the left side of which is reserved for the programs you use most often or that you have used most recently. Windows 7 devotes the right side of the menu to various important system folders, such as your Documents and Pictures folders, Control Panel, and Devices And Printers.

Four areas of the Start menu make it easy to run the programs and open the documents you need most. They are listed here in descending order of convenience and ease of use:

- **Pinned programs** The area in the upper left corner of the Start menu, above the horizontal line, is reserved for the programs you want to be accessible at all times. After you pin an item to this part of the Start menu, it stays there (unless you subsequently remove it).
- **Recently used programs** Windows populates the area directly below pinned programs with programs that you have used recently. You can change the number and types of programs that appear here; for details, see "Customizing the Left Side of the Start Menu" on page 130.
- **Start menu search box** The Start menu includes a search box (at the bottom on the left, directly below All Programs). You can get to anything on the menu, no matter how deeply nested it might be, by typing a few characters into this box. In the preceding illustration, for example, Microsoft OneNote 2010 does not appear on the left side of the menu because we haven't pinned it to the top of the menu or used it recently. Navigating to this program's menu entry would require a couple of clicks and a bit of scrolling (one click to open All Programs, another to open Microsoft Office). As Figure 4-4 shows, three characters in the search box are enough to bring Microsoft OneNote 2010 to the Programs area of the search results, at the top of the Start menu.

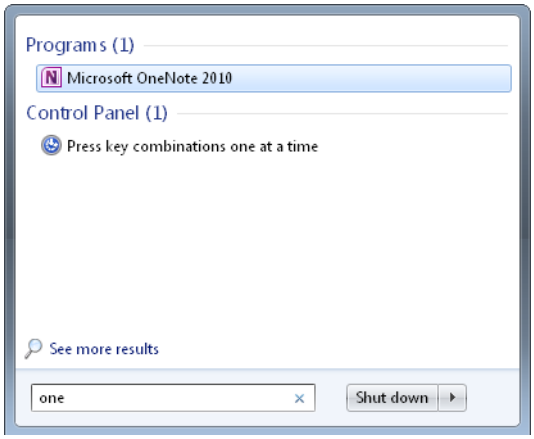


Figure 4-4 Typing **one** into the search box is sufficient to bring Microsoft OneNote 2010 to the top of the Start menu.

Provided you're not completely averse to typing, the search box pretty much eliminates the hassle of finding items that are buried several folders deep within the menu structure. The Start menu search box doesn't limit its searches to programs, however;

it's an entry point to the full-fledged search capabilities of Windows 7. For complete details, see Chapter 10, "Using Windows Search."

- **All Programs folder** Clicking All Programs opens a hierarchically arranged list of program icons similar to that found in earlier Windows versions. The All Programs menu is generated by merging the contents of two folders:
  - A personal folder, located at %AppData%\Microsoft\Windows\Start Menu\Programs
  - An "all users" folder, located at %ProgramData%\Microsoft\Windows\Start Menu\Programs

  As you might expect, items stored in the personal folder appear only on your own Start menu. Items stored in the "all users" folder appear on the Start menu of everyone who has an account on your computer.

Adding and Removing Pinned Programs

To add a program to the pinned programs area of the Start menu, right-click it wherever you see it (elsewhere on the Start menu, for example) and choose Pin To Start Menu. The item will take up residence at the bottom of the pinned programs area. If you'd like to give it a more prominent location, drag it upward.

> **Note**
>
> **If no shortcut menu appears when you right-click an item, and you can't drag the item to the pinned programs area, open the Customize Start Menu dialog box. (For details, see "Personalizing the Start Menu" on page 128.) In the list of options, select Enable Context Menus And Dragging And Dropping.**

To remove an item from the pinned programs area, right-click it and choose Unpin From Start Menu.

Using Jump Lists on the Taskbar and Start Menu

A powerful addition to the taskbar and Start menu is the *Jump List*, a menu of options closely related to the program associated with a taskbar button or an entry on the Start menu. Programs that are written to take advantage of Jump Lists in Windows 7 might include on the Jump List various common commands and tasks that can be performed with that program.

Jump Lists can be big timesavers even with older programs. For those programs, Windows adds to the Jump List a list of recently used documents, making it easy to reopen a recent document quickly.

In addition, each taskbar Jump List includes commands to open the program, to pin (or unpin) the program to the taskbar, and to close all open windows represented by the button.

Figure 4-5 shows Jump Lists for Internet Explorer.

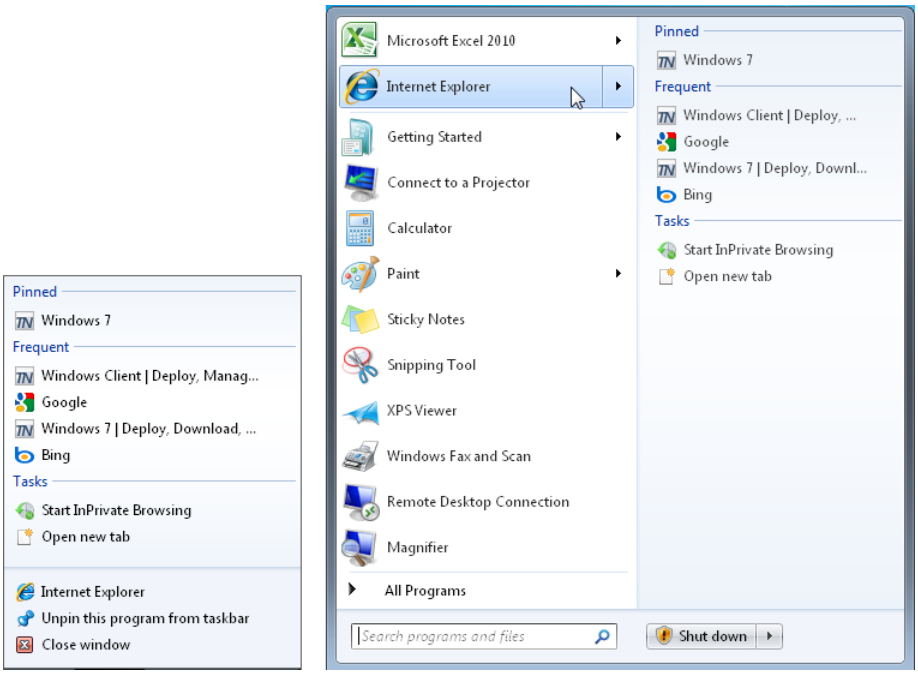


Figure 4-5 A taskbar Jump List (left) usually includes commands not on a Start menu Jump List (right).

To open a taskbar Jump List, use one of these techniques:

- Right-click the taskbar button.
- Using a stylus (or your finger, if you have a touch-capable computer), drag the taskbar button away from the edge of the screen in a flicking motion. When you release, the Jump List appears.
- The preceding technique was created for use with tablet and touch computers, but it also works with a mouse: point to the taskbar button, press the left mouse button, drag away from the taskbar, and release the mouse button.

On the Start menu, a Jump List is available only for programs that have been pinned and those in the recently used list. To display the Jump List associated with a Start menu item,

click the arrow next to the program name or simply hover the mouse pointer over the menu item.

Most of the Jump List content is created by the program's author or, in the case of recent items, generated by Windows. To keep favorite documents always available on the Jump List, you can pin an item in the recent documents list: point to it and click the pushpin icon, or right-click it and choose Pin To This List.

To protect your privacy or simply to clean up a cluttered list, you can remove an item from the recent list or the pinned list: right-click and choose Remove From This List (or, for pinned items, Unpin From This List).

INSIDE OUT

Clear recent items from all Jump Lists

The recent items lists on Jump Lists, grouped by program, largely replace the need for a Recent Items menu on the Start menu, which is disabled by default in Windows 7. (If you want to restore the Recent Items menu, open the Customize Start Menu dialog box and select Recent Items.) Like the Recent Items menu in previous Windows versions, the recent items shown on Jump Lists are derived from the contents of the folder %UserProfile%\Recent. Note that you can't add items to recent lists by making direct additions to %UserProfile%\Recent. For the purposes of building these lists, Windows simply ignores anything in the Recent folder that it didn't put there itself.

To clear all recent items (but not pinned items) from Jump Lists and from the Recent Items menu, right-click the Start button and choose Properties. On the Start Menu tab of the Taskbar And Start Menu Properties dialog box, clear the Store And Display Recently Opened Items In The Start Menu And The Taskbar check box. Windows clears out the %UserProfile%\Recent folder when you do this.

Personalizing the Taskbar and Start Menu

The new look of the taskbar and the default selection of commands on the Start menu are not for everyone. In this section, we describe the tools and methods for customizing them to work the way you like.

Changing the Taskbar's Appearance and Behavior

As described in the following sections, you can modify the order, size, appearance, and grouping of taskbar buttons and change the overall taskbar size and location. Many of these changes are made most easily through the Taskbar And Start Menu Properties dialog

box (see Figure 4-6), which you can open by right-clicking an unoccupied area of the taskbar and choosing Properties.

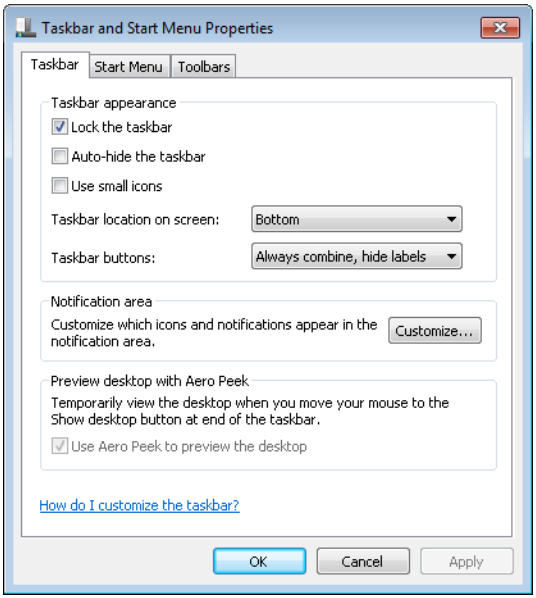


Figure 4-6 You can also display this dialog box by right-clicking the Start button, choosing Properties, and clicking the Taskbar tab.

Changing the Order of Taskbar Buttons

One of the most useful personalizations you can make doesn't require a visit to any dialog box. To change the order of buttons on the taskbar, simply drag them to the place you want. Pinned program icons retain their order between sessions, allowing you to quickly find your most used programs in their familiar (to you) location.

Changing the Size, Appearance, and Grouping of Taskbar Buttons

Two items on the Taskbar tab of Taskbar And Start Menu Properties control the size and appearance of taskbar buttons:

- **Use Small Icons** Select Use Small Icons if you want to reduce the height of taskbar buttons, making them similar to the button size in earlier Windows versions.
- **Taskbar Buttons** The default setting for Taskbar Buttons is Always Combine, Hide Labels. This setting suppresses the display of labels (window titles) and causes Windows to always group multiple windows from a single application into a single taskbar button.

With either of the other settings (Combine When Taskbar Is Full or Never Combine), Windows displays the window title (or as much as it can fit) on the taskbar button, much like it does in earlier versions of Windows. (See Figure 4-7.) The difference between these settings is that with Combine When Taskbar Is Full, each window gets its own separate taskbar button until the taskbar becomes too crowded, whereupon Windows groups windows from a program into a single taskbar button. With Never Combine, taskbar buttons continue to diminish in size as you open more windows.

Figure 4-7 Selecting Use Small Icons and Combine When Taskbar Is Full results in a taskbar similar to what you see in Windows XP or Windows Vista.

Changing the Taskbar's Size and Appearance

The default height of the taskbar is enough to display one taskbar button. (If you switch between large and small icons, the taskbar automatically adjusts its height to fit.) You can enlarge it—and given the typical size and resolution of computer displays these days, enlarging it is often a great idea. Before you can change the taskbar's dimensions, you need to unlock it. Right-click an unoccupied area of the taskbar, and if a check mark appears next to the Lock The Taskbar command, click the command to clear the check mark. Then position the mouse along the border of the taskbar farthest from the edge of the screen. When the mouse pointer becomes a two-headed arrow, drag toward the center of the screen to expand the taskbar. Drag the same border in the opposite direction to restore the original size.

Getting the Taskbar Out of Your Way

By default, the taskbar remains visible even when you're working in a maximized program. If that's inconvenient for any reason, you can tell it to get out of the way. In the Taskbar And Start Menu Properties dialog box, shown in Figure 4-6, select Auto-Hide The Taskbar. With this option selected, the taskbar retreats into the edge of the desktop whenever any window has the focus. To display the taskbar, move the mouse pointer to the edge of the desktop where the taskbar is "hidden."

Note

Regardless of how you set the auto-hide option in the Taskbar And Start Menu Properties dialog box, you can make the taskbar visible at any time by pressing the Windows logo key or Ctrl+Esc.

Moving the Taskbar

The taskbar docks by default at the bottom of the screen (the main screen, if you have more than one), but you can move it to any other edge, including any edge of a secondary screen. To move the taskbar, select a Taskbar Location On Screen option in Taskbar And Start Menu Properties.

As an alternative, you can manipulate the taskbar directly: Unlock it (right-click an unoccupied spot and choose Lock The Taskbar—unless no check mark appears beside that command, which means that the taskbar is already unlocked). Then drag any unoccupied part of the taskbar in the direction you want to go. (Don't drag the edge of the taskbar closest to the center of the screen; doing that changes the taskbar's size, not its position.)

Using Additional Toolbars

A seldom-used feature of the taskbar is its ability to host other toolbars. Optional toolbars might provide shortcuts to folders, documents, and applications, or they might be miniapplications that operate entirely within the confines of the taskbar. Toolbars you can choose to install include the following:

- **Address** The Address toolbar provides a place where you can type an Internet address or the name and path of a program, document, or folder. When you press Enter or click the Go button, Windows takes you to the Internet address, starts the program, opens the document, or displays the folder in a Windows Explorer window. The Address toolbar is functionally equivalent to the Start menu's Run command or the address bar in Windows Explorer or Internet Explorer.

- **Links** The Links toolbar provides shortcuts to Internet sites; it is equivalent to the Links toolbar in Internet Explorer.

- **Tablet PC Input Panel** The Tablet PC Input Panel toolbar provides a single tool—an icon you can click (or, more likely, tap with a stylus) to display or hide the panel that encompasses the writing pad and touch keyboard. (For details about using the Tablet PC Input Panel, see "Using the Writing Pad and Touch Keyboard" on page 1145.)

- **Desktop** The Desktop toolbar provides copies of all the icons currently displayed on your desktop. In addition, it includes links to your Libraries, Homegroup, Computer, Network, Control Panel, and other user profile folders. When you click the toolbar's double arrow, a cascading menu of all the folders and files on your system appears.

> **Note**
>
> **Pinned icons on the taskbar obviate the Quick Launch toolbar, a regular taskbar feature since the days of Windows 95. But if you prefer to use it, we show you how: see the tip "Restore the Quick Launch toolbar" on page 114.**

Installing and Removing Toolbars To install a new toolbar or remove one you're currently using, right-click any unoccupied part of the taskbar or any existing toolbar. Choose Toolbars from the shortcut menu that appears, and then choose from the ensuing submenu. A check mark beside a toolbar's name means that it is already displayed on the taskbar. Clicking a selected toolbar name removes that toolbar.

> **Note**
>
> **You can also display any of the predefined toolbars (listed earlier) or remove any currently displayed toolbar by using the Toolbars tab of the Taskbar And Start Menu Properties dialog box.**

Sizing and Positioning Toolbars Before you can change a toolbar's size or position on the taskbar, the taskbar itself must be unlocked. To do that, right-click an unoccupied area of the taskbar and, if a check mark appears next to the Lock The Taskbar command, click the command to clear the check mark.

When the taskbar is not locked, a dotted vertical bar appears at the left edge of every toolbar. (If the taskbar is displayed vertically against the left or right edge of the desktop, the bar is horizontal and appears at the top of the toolbar.) This is the toolbar's handle. To reposition a toolbar within the taskbar, drag the handle.

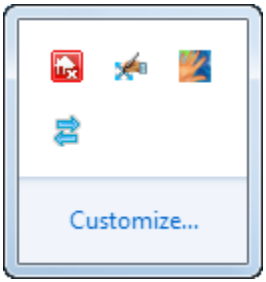
> **Note**
>
> **Unlike Windows XP, Windows 7 insists that toolbars be docked to the taskbar.**

Creating a New Toolbar Any folder on your system can become a toolbar. To create a new toolbar, right-click an existing toolbar or a spot on the taskbar, choose Toolbars, and then choose New Toolbar. In the next dialog box, navigate to a folder and click Select Folder.

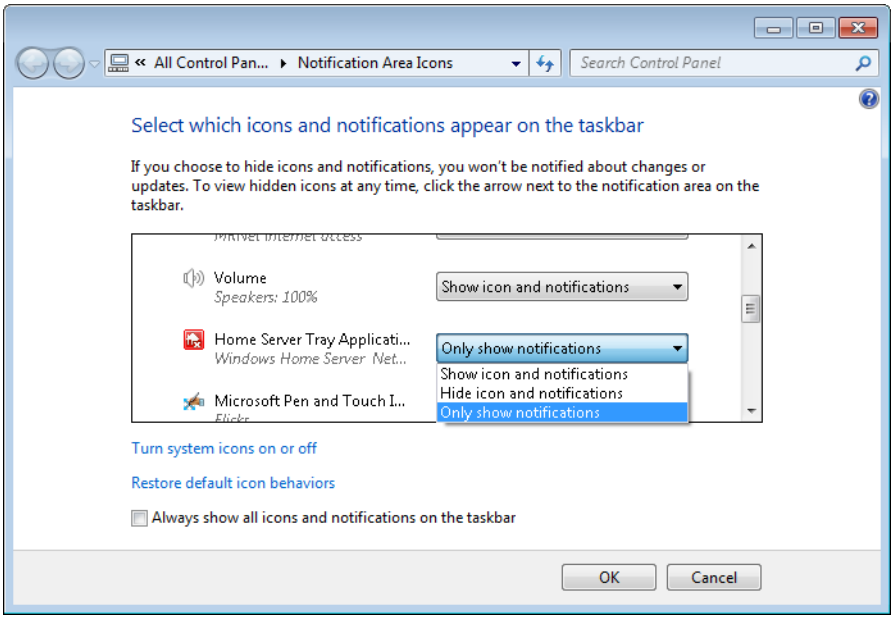
The folder's name becomes the name of the new toolbar, and each item within the folder becomes a tool.

Controlling How Notifications Appear

In previous versions of Windows, the *notification area* (also sometimes called the system tray or the status area) often becomes crowded with tiny icons—many of which don't "notify" you of anything. To deal with notification-area congestion, Windows 7, by default, keeps a few icons visible at all times but hides the icons that you aren't actually using. And unlike in previous Windows versions, the notification area doesn't consume an increasingly large chunk of the taskbar; new icons are corralled in a box that appears only when you click the arrow at the left end of the notification area to display the hidden items.



You can personalize this behavior in the Notification Area Icons control panel. To get there, display the hidden notification area icons and click Customize. Alternatively, begin typing **notification** in the Start menu search box or the Control Panel search box, and then click Notification Area Icons.



For each notification area icon, you can select one of three options:

- **Show Icon And Notifications** Selecting this option displays the icon on the taskbar at all times.
- **Hide Icon And Notifications** With this option, the icon appears only when you click the arrow at the left end of the notification area. Notifications from the program are squelched.
- **Only Show Notifications** Like the previous option, this one hides the icon, but it allows its program to pop up notification messages.

The system icons (Clock, Volume, Network, Power, and Action Center) can be remanded to the box of hidden icons by selecting either of the last two options. But if you'd rather banish one or more of them altogether, click Turn System Icons On Or Off. The dialog box shown in Figure 4-8 appears.

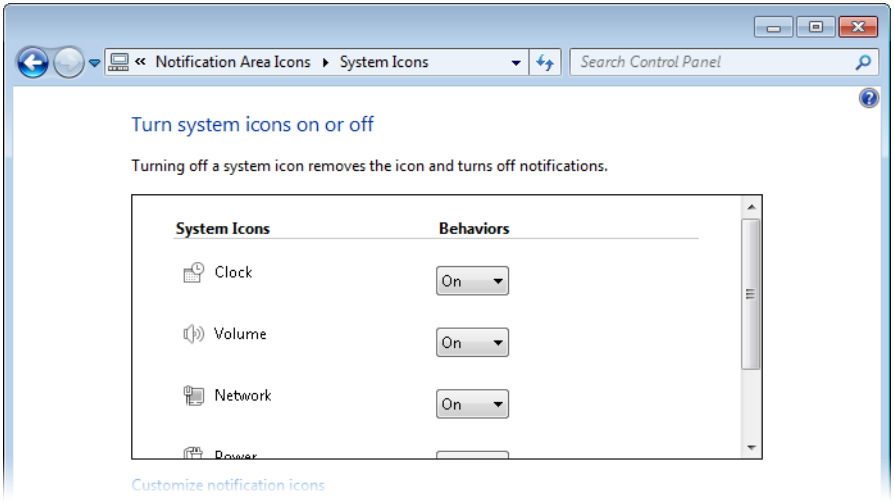


Figure 4-8 Windows displays four (or five, for battery-powered computers) notification area icons unless you modify the System Icons options here.

One final option can come in handy if you don't like having to click the arrow to display hidden icons (and you don't mind having a string of notification area icons as long as your arm). If you want to see all your notification area icons at all times, select Always Show All Icons And Notifications On The Taskbar. This is an all-or-nothing proposition, but remember that you can turn off any of the system icons you don't use. Also, some well-behaved programs have an option (usually accessible by clicking the notification area icon and choosing Options) to not display their icons.

INSIDE OUT

Drag notification area icons

Perhaps the easiest way to specify the appearance option for a notification area icon is to simply drag the icon—a technique you can apply to system icons (except Clock) as well as to other notification area icons. Dragging an icon to the hidden area sets it to Only Show Notifications, whereas dragging it to the taskbar is equivalent to selecting Show Icon And Notifications. Dragging also lets you specify the order of icons in each area.

INSIDE OUT

Use a keyboard shortcut for notification area tasks

If you're one of those users whose fingers never leave the keyboard, you can press Windows logo key+B to move the focus to the notification area. Use the arrow keys to highlight different icons on the taskbar, or, when the arrow is highlighted, press Spacebar to display the hidden icons. You can then use arrow keys to select an icon, and the Menu or Shift+F10 keys to display the icon's menu.

Personalizing the Start Menu

Although Windows 7 does not offer a "classic" Start menu as found in Windows XP and Windows Vista, it offers plenty of other personalization options. Begin your fine-tuning on the Start Menu tab of the Taskbar And Start Menu Properties dialog box (shown in Figure 4-9), which you reach by right-clicking the Start button and choosing Properties.

Many more options become available when you click Customize to display the Customize Start Menu dialog box, shown in Figure 4-10.

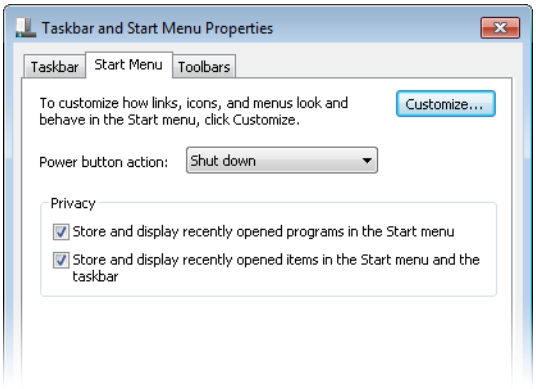


Figure 4-9 Options and check boxes on the Start Menu tab of the Taskbar And Start Menu Properties dialog box let you control the default action of the Power button and erase evidence of what you've been doing at your computer.

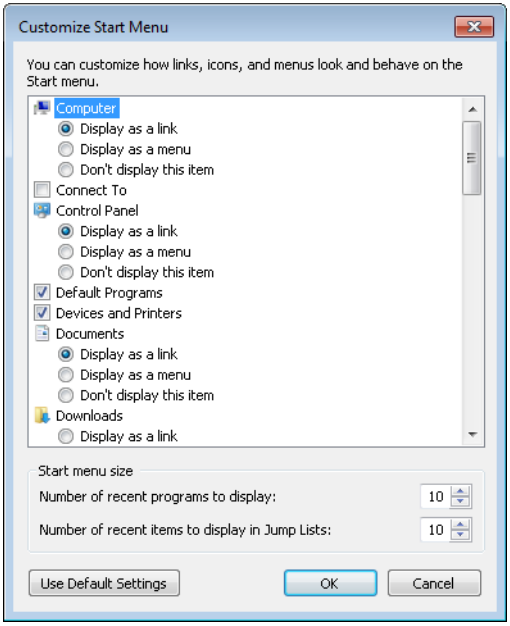


Figure 4-10 Don't fail to scroll down in this crowded dialog box to expose many more options.

Customizing the Left Side of the Start Menu

Quite apart from choosing which programs appear in the pinned programs section at the top of the left side of the Start menu (see "Adding and Removing Pinned Programs, Documents, and Folders" on page 113 for information about customizing that aspect of the menu), you have several choices that control the menu's left side.

For starters, your choices under Privacy on the Start Menu tab of Taskbar And Start Menu Properties (shown earlier in Figure 4-9) determine whether Windows keeps track of recently used programs and displays them below the pinned programs and whether Windows keeps track of recently opened documents and displays them as a Jump List associated with a pinned or recently used program. If you choose to keep these options enabled, you can proceed to the Customize Start Menu dialog box (shown in Figure 4-10) and use the settings under Start Menu Size to specify the maximum number of recent programs to include on the Start menu (the allowable range is 0 through 30) and the maximum number of recent items to include on each Jump List (0 through 60).

INSIDE OUT

Control which programs are included in the recent list

The list of recently used programs—the items that appear below the pinned programs on the left side of the Start menu—is controlled by Windows. The list includes only shortcuts to executable files you open, such as .exe files and .msc files. The following items are excluded by default (for more information, see Knowledge Base article 279767, "Frequently Used Programs Not Automatically Added to the Start Menu," at *w7io.com/0401*):

- **Programs listed in the AddRemoveApps value of the registry key HKLM\Software\Microsoft\Windows\CurrentVersion\Explorer\FileAssociation. By default, the following items are excluded: Setup.exe, Install.exe, Isuninst.exe, Unwise.exe, Unwise32.exe, St5unst.exe, Msoobe.exe, Lnkstub.exe, Control.exe, Werfault.exe, Wlrmdr.exe, Guestmodemsg.exe, Msiexec.exe, Dfsvc.exe, and Wuapp.exe. By modifying this registry value, you can tailor the exclusion list to suit your needs.**
- **Items whose shortcut names include any of the following text: Documentation, Help, Install, More Info, Readme, Read Me, Read First, Setup, Support, What's New, or Remove. This list of exclusion strings is specified in the AddRemoveNames value of HKLM\Software\Microsoft\Windows\CurrentVersion\Explorer\FileAssociation.**
- **Items in the Games folder (Professional, Ultimate, and Enterprise editions only). Apparently to prevent workers who goof off from getting in trouble, business editions of Windows 7 exclude games from the list of recently used programs.**

Other options scattered about the Customize Start Menu dialog box (all selected by default) determine the appearance and behavior of the left side of the Start menu:

- **Sort All Programs Menu By Name** When this option is selected, Windows always sorts the All Programs menu alphabetically. Clear this option to display the menu in the order that items were added to it, or in the order you create by moving items around the menu.
- **Use Large Icons** Clear this option if you want to fit more items on the left side.
- **Enable Context Menus And Dragging And Dropping** When this option is selected, you can move items on the left side of the menu and on the All Programs menu by dragging. In addition, context menus (which appear when you right-click an item on the left side of the menu or on the All Programs menu) are enabled. Clearing this option disables both capabilities.
- **Highlight Newly Installed Programs** When this option is selected, new programs are highlighted with a colored background so that they're easy to find; if you find that distracting, clear the option.
- **Open Submenus When I Pause On Them With The Mouse Pointer** When this option is selected, Jump Lists and cascading menus appear on the right side of the Start menu when you hover the mouse; when this option is cleared, you must click the arrow to display these items.

Customizing the Right Side of the Start Menu

The right side of the Start menu has an assortment of buttons that open various data folders and system folders. Options in Customize Start Menu (shown in Figure 4-10) let you add to or subtract from this collection, and they let you control the behavior of certain items.

INSIDE OUT

Change your Start menu picture

The picture that appears at the top of the right side of the Start menu is the one associated with your user account (the one that also appears on the Welcome screen). If you're not happy with it, click it. That takes you to the User Accounts section of Control Panel, where you can specify a different picture.

Choosing Link, Menu, or No Show Several of the items in the Customize Start Menu list offer you the choice of Display As A Link, Display As A Menu, and Don't Display This Item. The first option displays a button that opens the folder in Windows Explorer, whereas the

second option displays a button that opens the folder's contents as a submenu sprouting from the side of the Start menu. Following is a list of folders you can customize in this manner:

- Computer
- Control Panel
- Documents
- Downloads
- Games
- Music
- Personal Folder
- Pictures
- Recorded TV
- Videos

INSIDE OUT **Use links and submenus interchangeably**

You can have it both ways. If you opt for submenus, you can still open items in Windows Explorer. Just right-click and choose Open.

Displaying Other Folders Other folders don't offer the link vs. submenu option, but your Start menu customization is not complete until you decide whether to include any of these folders for single-click access:

- Favorites Menu (displays your Favorites menu as a cascading submenu)
- Homegroup (displays shared resources on your home network)
- Network (displays computers and devices on your network)
- Recent Items (displays your 15 most recently opened documents, from all applications)
- Default Programs (opens the Control Panel tool for specifying which program opens each document type)
- Devices And Printers (opens the Control Panel tool for managing your computer hardware)
- System Administrative Tools (displays a menu of advanced system-management programs)

- Connect To (displays a list of available network connections)
- Help (opens Help And Support)

Displaying the Run Command The Run command, a perennial favorite of computer enthusiasts, is no longer a standard Start menu feature. You can make sure it's still part of your Start menu by selecting Run Command in the Customize Start Menu dialog box.

You might find you can live comfortably without the Run command. When you're tempted to type a program name in the Run dialog box, try typing it in the Start menu search box instead. The Search feature won't always get you where you want to go (it's no good when you need a command-line switch, for example), but it's more versatile than you might expect. Typically, you can run an executable by simply typing its name in the search box and pressing Enter, just as you would in the Run dialog box. On the other hand, the Run dialog box remembers command strings that you have entered before, and the search box has nothing to replace that.

INSIDE OUT

Open the Run dialog box with a keypress

Whether or not your Start menu includes it, you can always get to the Run dialog box by pressing Windows logo key+R.

Controlling Where the Search Box Searches

Two options in the Customize Start Menu dialog box let you customize the behavior of the Start menu search box:

- **Search Other Files And Libraries** The default setting, Search With Public Folders, includes in a Start menu search the same document files and folders that are included in other searches. (For details, see "Configuring Search and Indexing Options" on page 368.) With the other settings, you can limit the scope of a search to exclude public folders, or you can completely disable the search of documents and folders.
- **Search Programs And Control Panel** With this option selected (the default setting), searches look for program names and Control Panel tools or tasks that match your search text.

For more information, see "Searching from the Start Menu" on page 379.

Mastering Window Management with Windows 7 Tricks

Windows 7 includes a host of keyboard shortcuts and mouse gestures that greatly simplify the everyday tasks of managing windows: resizing, moving, minimizing, switching, and so on. These new methods are easily learned and remembered—but they're not easily discovered. In this section, we'll show you the way.

And don't worry: All the keyboard shortcuts and other tricks you've used in previous versions of Windows continue to work the same way in Windows 7.

Resizing and Moving Windows

New mouse gestures in Windows make it easy to work with certain windows without being distracted by the clutter of others:

- *Aero Snap* has three functions. The first one makes it easy to maximize a window or restore it to its previous size and position. Simply drag the title bar to the top of the screen to maximize it, or drag the title bar away from the top edge to restore it. (Although Windows has long offered comparable capability with the Maximize and Restore buttons in the title bar, this new gesture offers a much bigger target. This feature also makes it possible to move a maximized window from one screen to another on a multimonitor system.)

  The second Aero Snap function makes it easy to split the screen space between two windows for side-by-side editing or comparisons: drag a window title bar to the left edge of the screen, and it snaps to fill the left half of the screen. (Note that the window resizes when the mouse pointer hits the edge of the screen. To use this feature with minimal mouse movement, start your drag action by pointing at the title bar near the edge you're going to snap to.) Drag a title bar to the right edge to fill the right half of the screen. Begin dragging a window that has been resized this way away from the edge of the screen, and it returns to its previous size and position.

  The third function is useful if you want full-height, side-by-side windows but you don't want them to fill exactly half the screen width. It's also good for obtaining maximum window height without making text lines too long to read, especially on widescreen monitors. Drag the top window border (not the title bar) to the top edge of the screen, or drag the bottom border to the bottom edge of the screen. With either action, when you reach the edge the window snaps to full height, without changing its width. When you drag the border away from the window edge, the opposite border snaps to its previous position.

- *Aero Shake* minimizes all windows except the one you want to use. To do that, point to the window's title bar, hold down the mouse button, and quickly move it back and forth a few times. Suddenly, all windows except that one retreat to the taskbar.

This one takes a bit of practice, but once you get the hang of it, you'll probably use it often. It requires only three "shakes"—a smooth left, right, left motion is best—not maniacal shaking.

> **Note**
>
> **Although the names of these features include the word *Aero*, you do not need to have Aero enabled to use these mouse gestures. Without Aero, you lose some of the associated visual effects, but the outcomes are the same.**

Windows 7 includes keyboard shortcuts that correspond with the preceding mouse gestures. These are shown in Table 4-1.

Table 4-1 Keyboard Shortcuts and Mouse Gestures for Resizing and Moving Windows

Task	Keyboard Shortcut	Mouse Gesture
Maximize	Windows logo key+ Up Arrow	Drag title bar to top of screen
Resize window to full screen height without changing its width	Shift+Windows logo key+Up Arrow	Drag top or bottom border to edge of screen
Restore a maximized or full-height window	Windows logo key+ Down Arrow	Drag title bar or border away from screen edge
Minimize a restored window	Windows logo key+ Down Arrow	Click the Minimize button
Snap to the left half of the screen	Windows logo key+ Left Arrow*	Drag title bar to left edge
Snap to the right half of the screen	Windows logo key+ Right Arrow*	Drag title bar to right edge
Move to the next monitor to the left	Shift+Windows logo key+Left Arrow	Drag title bar
Move to the next monitor to the right	Shift+Windows logo key+ Right Arrow	Drag title bar
Minimize all windows except the active window (press again to restore windows previously minimized with this shortcut)	Windows logo key+ Home	"Shake" the title bar
Minimize all windows	Windows logo key+M	
Restore windows after minimizing	Shift+Windows logo key+M	

* Pressing this key repeatedly cycles through the left, right, and restored positions. If you have more than one monitor, it cycles these positions on each monitor in turn.

The new taskbar in Windows 7 also uses a new trick to expose the traditional window menu: hold the Shift key as you right-click a taskbar button. For a button that represents a single window, the menu includes commands to Restore, Move, Size, Minimize, Maximize, and Close the window. Shift+right-clicking a grouped taskbar button displays commands to arrange, restore, minimize, or close all windows in the group.

INSIDE OUT

Disable Aero Snap and Aero Shake

If you find it disconcerting to have windows snap to a certain size and position when you drag their title bars, you can disable Aero Snap. Unfortunately, the setting for doing so is no more obvious than the mouse gestures themselves. In the Start menu search box or in Control Panel, type mouse and then click Change How Your Mouse Works. Near the bottom of the window that appears, select Prevent Windows From Being Automatically Arranged When Moved To The Edge Of The Screen. Selecting this option disables Aero Snap and Aero Shake altogether, including keyboard shortcuts.

Viewing the Desktop and Gadgets

Sometimes you need to get to the bottom of things, whether it's to use a desktop icon, view a desktop gadget, or simply enjoy your gorgeous desktop background. Windows 7 has some ways to simplify these tasks.

If you're using Aero, you can view the desktop with an overlay of outlines representing all open windows, as shown in Figure 4-11; simply point to the Show Desktop tool, the empty space at the right end of the taskbar. (If your taskbar is on the left or right side of the screen, Show Desktop is at the bottom.) When you move the mouse pointer away, the previous window arrangement returns. You can get the same effect by pressing Windows logo key+Spacebar.

For a more lasting effect, click Show Desktop, and all windows are hidden. (This works with or without Aero enabled.) To restore the previous arrangement, click Show Desktop again. If you prefer to use the keyboard, Windows logo key+D toggles between these two views.

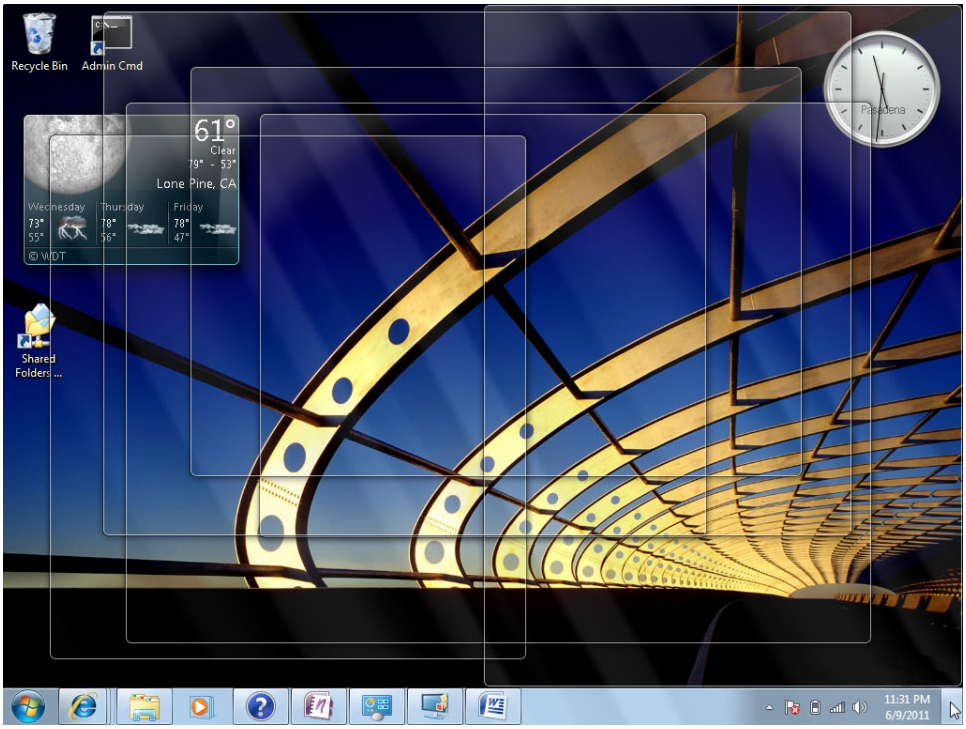


Figure 4-11 View the desktop, including gadgets, without a single mouse click.

You can bring your gadgets to the fore without minimizing or hiding your open windows; simply press Windows logo key+G. For more information about desktop gadgets, see "Using and Customizing Desktop Gadgets" on page 160.

Switching Between Windows

In addition to the taskbar-centric methods described in "Switching Tasks" on page 114, the time-honored task-switching keyboard shortcuts continue to work in Windows 7. Alt+Tab cycles between the open windows (and, with Aero enabled, invokes Aero Peek); Shift+Alt+Tab reverses the order. Windows logo key+Tab cycles through the open windows by using the visually flashy Flip 3D feature introduced in Windows Vista.

Personalizing Theme Elements: Visuals and Sounds

The most obvious way to personalize your Windows experience is to customize its visual appearance—the desktop background, the window colors, and so on—and to select the sounds that Windows uses to let you know what it's up to. These settings are made in the aptly named Personalization, a Control Panel tool that appears when you right-click the desktop and choose Personalize. You can also open Personalization, which is shown in Figure 4-12, by starting to type **personalization** in the Start menu search box or in the Control Panel search box, and then clicking the Personalization link that appears.

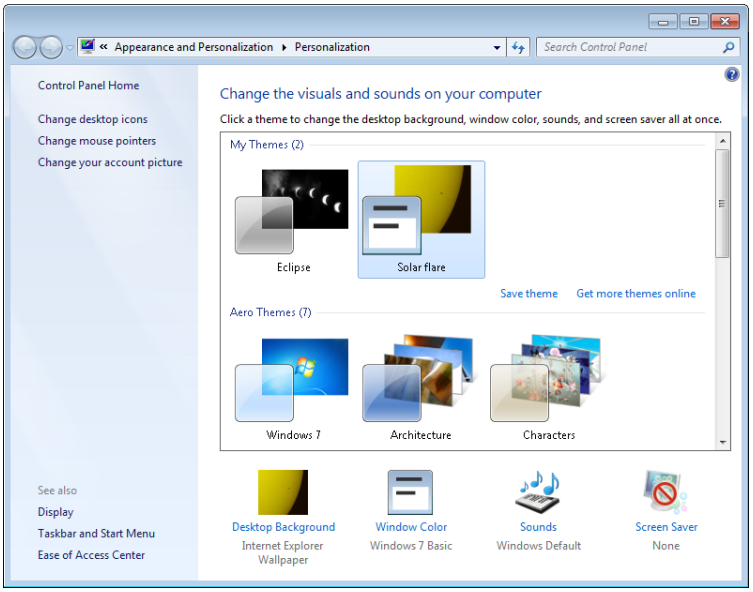


Figure 4-12 Personalization is your home base for setting backgrounds, colors, sounds, screen savers, desktop icons, and mouse pointers.

A *theme* in Windows 7 is an *über* configuration that combines and names the various personalization settings that you can make. Themes can incorporate the following:

- Desktop background
- Window color
- Settings that you make in the "advanced" Window Color And Appearance dialog box
- Sound scheme
- Screen saver

- Desktop icons
- Mouse pointer scheme

Note that these are all settings that pertain to your own profile; that is, they're specific to your user account. Settings that apply to all users at your computer, such as screen resolution, are not included in the current theme.

Windows 7 includes some terrific predefined themes, and you can select one simply by clicking it in Personalization. (Alternatively, type **theme** in the Start menu search box, and then click on Change The Theme when it appears in the search results.) The theme is applied right away, so if you don't like what you see and hear, you can select another before you close Personalization.

For information about saving your own settings as a theme and using themes that others have created, see "Saving, Sharing, and Finding Theme Settings" on page 152.

Understanding and Using Windows Aero

This chapter contains several references to *Windows Aero*, which is the default graphical user interface in most editions of Windows. The Aero interface uses *desktop composition* to achieve effects such as these:

- **Transparent window frames**
- **Live previews of running programs via buttons on the taskbar**
- **Live previews of the windows that you can switch to by pressing Alt+Tab**
- **Flip 3D—a feature that shows all open windows (and the desktop) as a three-dimensional stack when you press the Windows logo key+Tab**
- **Smoother window dragging**
- **Interactive window controls (Close buttons that glow on hover, for example)**
- **Animated window closings and openings**

With desktop composition on, applications write to video card memory buffers instead of directly to the screen, and the Desktop Window Manager feature of Windows 7 arranges the video surfaces in the appropriate order and presents the results to the screen.

In a nutshell, the requirements to use Aero are as follows:

- Windows 7 Home Premium, Professional, Ultimate, or Enterprise (Aero is not available with Windows Starter edition, and only a subset of Aero features is available in Windows 7 Home Basic)
- A DirectX 9–class graphics processing unit (GPU) with a Windows Display Driver Model (WDDM) 1.0 or higher display driver
- An Aero-based theme (one from the Aero Themes category in Personalization or one based on any of those themes)

Turning Aero Off

Even if you're not wild about transparency and animation, there's plenty to like about Aero. Smoother window dragging, the preview icons on the taskbar, and the improved task-switching features are well worth the price of admission—for most users. Nevertheless, admission is not entirely free; the Aero interface uses more graphics memory than the non-Aero interface—especially because achieving smoother window movement requires Aero to store the contents of all open windows in video memory, not just the windows that are currently visible.

If Aero slows you down or annoys you for any other reason, you can turn it off. In Personalization, choose any of the themes in the Basic And High Contrast Themes category. For a solid, if stolid, user interface that retains the new look and feel of Windows 7 without taxing your graphics subsystem, choose Windows 7 Basic.

What if you like transparency but don't care for the animated opening and closing of windows or certain other effects? In the Start menu search box, type **effects** and then click Adjust The Appearance And Performance Of Windows. Clearing the Animate Windows When Minimizing And Maximizing check box, on the Visual Effects tab in Performance Options, turns off these animated transitions. Other options let you squelch other unwanted Aero effects.

Customizing the Desktop Background

You can perk up any desktop with a background image. Your background can be supplied by a graphics file in any of several common formats (.bmp, .gif, .jpg, .png, and .tif). And you're not stuck with a static image, either. You can set up a slide show of images, and you can even use an RSS feed to supply new images.

To select a background, right-click the desktop, choose Personalize from the shortcut menu, and then click Desktop Background. The Picture Location box in Desktop Background (shown in Figure 4-13) provides a selection of useful categories. The Windows Desktop Backgrounds category itself is divided into several image categories. The Top Rated Photos category includes pictures from your own Pictures library to which you've assigned a four-star or five-star rating. You might want to maximize the dialog box to get a better look at the offerings.

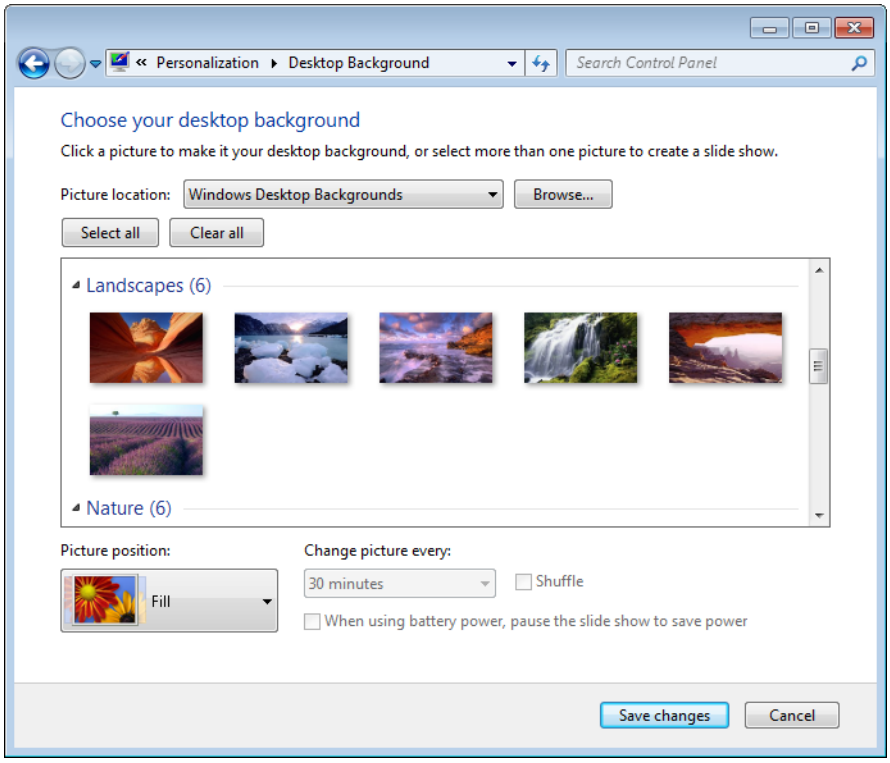


Figure 4-13 If you get tired of the wallpaper selections that come with Windows, you can always use your own pictures instead.

If you don't find what you need, click Browse. Folders to which you navigate via the Browse button will subsequently appear in the Location list, making it easy for you to go back and grab a different image from the same folder.

INSIDE OUT

Find more great photographs hidden in your Windows installation

In the Windows Desktop Backgrounds picture location, you might've noticed a category with your country name or region as its name; the category includes a number of photographs taken in that place. With a little digging, you can find pictures of other places already installed on your hard drive. To do so, follow these steps:

1. **Display "super-hidden" files. In the Start menu search box, type folder options. On the View tab of Folder Options, select Show Hidden Files, Folders, And Drives and clear Hide Protected Operating System Files (Recommended). Click Apply.**
2. **In Desktop Background, click Browse, and navigate to %Windir%\Globalization\MCT. (On most systems, %Windir% is C:\Windows.) The MCT folder has a subfolder for each installed country. Expand one of these, and then select the subfolder with the country name spelled out. (For example, the full path might be C:\Windows\Globalization\MCT\MCT-ZA\South Africa.)**
3. **Return to Folder Options, undo the changes you made in step 1 (or simply click Restore Defaults), and click OK.**

The newly found pictures appear in Desktop Background. And it's easy to get back to these pictures later; the country name now appears as an option in the Picture Location list.

You can select one or more images in Desktop Background. (To select multiple images, click a category name or select the check box that appears when you point to each image you want to use. Alternatively, Ctrl+click each image.) When you select multiple images, Windows switches between the selected images periodically, creating a slide show effect.

After you choose your images, select one of the five Picture Position options to let Windows know how you want to handle images that are not exactly the same size as your screen resolution.

Then, if you've selected more than one image, specify how often you want Windows to change the background; the settings range from 10 seconds to 1 day. Selecting Shuffle causes the backgrounds to be chosen randomly from your selected images; otherwise, Windows cycles through the images in the order in which they appear in Desktop Background.

INSIDE OUT

Use pictures from an RSS feed

If you want an ever-changing collection of pictures to use as your desktop background, you can configure a theme to obtain images from an RSS feed. If you post your own photos to a photo-sharing site, for example, you could configure your computer to pick up those pictures and use them. (Not every photo feed works, however. You must use one that includes the photo as an enclosure. Flickr is one service that uses enclosures.) Because Windows 7 doesn't provide an interface for enabling RSS-fed images as desktop backgrounds, the easiest way to set one up is to edit an existing .theme file that includes a slide show. Open it in Notepad. Then, in the [Slideshow] section, remove the ImagesRootPath line and all Item*n*Path lines. Replace them with a line like this (using the URL to the RSS feed, of course):

```
RSSFeed=http://www.example.com/rssfeed
```

For complete details about .theme files, see the MSDN article "Creating and Installing Theme Files" at *w7io.com/0402*.

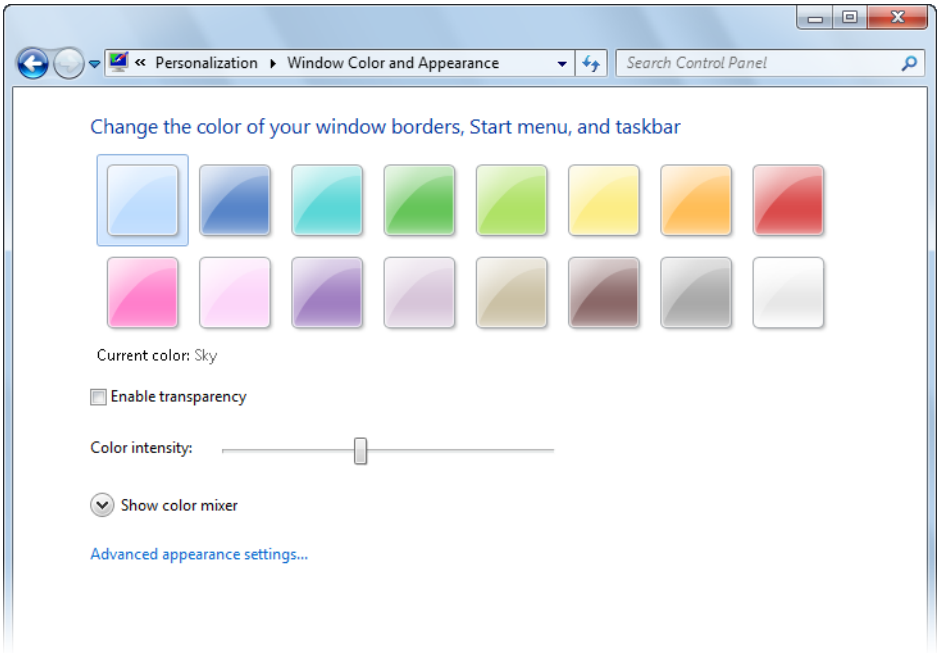
Here are some other ways to change the wallpaper:

- Right-click an image file in Windows Explorer, Windows Photo Viewer, or Windows Live Photo Gallery and choose Set As Desktop Background. This centers the selected image.
- Right-click an image in Internet Explorer and choose Set As Background. This displays the selected image using the current picture position setting.
- Open any image file in Paint, open the Paint menu (the icon to the left of the Home tab), and choose Set As Desktop Background. A submenu lets you choose among Fill, Tile, and Center picture positions.

Selecting Colors and Modifying Color Schemes

With a beautiful desktop background in place, your next personalization step might be to select a complementary color for the window borders, Start menu, and taskbar. To do that, right-click the desktop, choose Personalize, and then click Window Color.

If you're using an Aero theme, Window Color And Appearance appears, as shown next. If none of the 16 choices meets your needs exactly, you can click Show Color Mixer and dial in your own blend of Hue, Saturation, and Brightness.

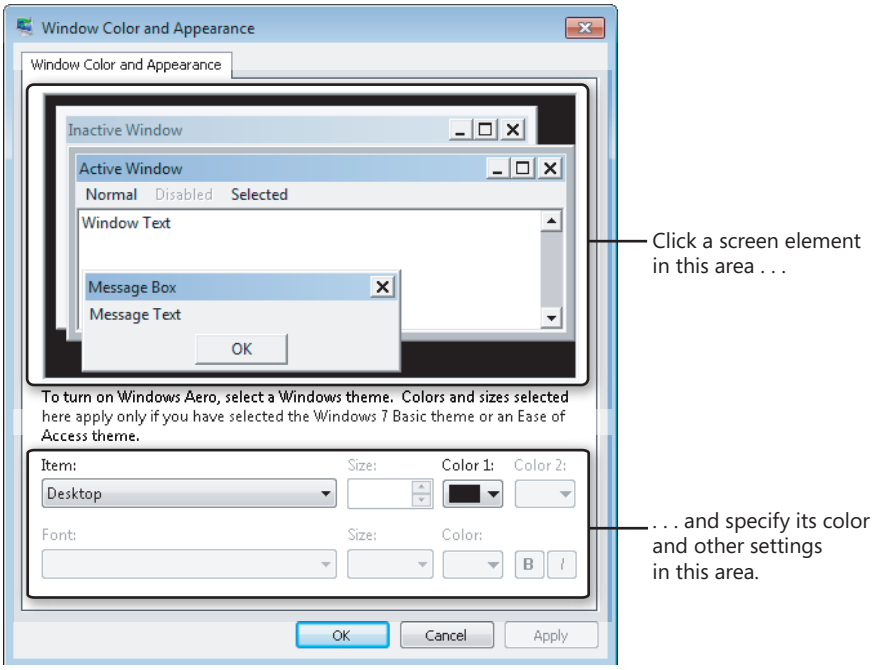


You can also adjust the transparency of your window frames. Dragging the Color Intensity slider to the right makes window frames darker and less transparent. If you want lighter colors but don't fancy transparency at all, clear the Enable Transparency check box. You might find this "Aero sans trans" approach convenient at times if you need to generate pictures of windows for presentation purposes and don't want the pictures to include distracting "behind the scenes" material.

If you're not using an Aero theme, clicking Window Color displays a different Window Color And Appearance dialog box, as shown next.

Note

This same dialog box appears when you click Advanced Appearance Settings in the Aero version of Window Color And Appearance. There's no particular reason to go there if you're using Aero, however, because most settings in this dialog box apply only to basic and high-contrast (that is, non-Aero) themes.



Each basic and high-contrast theme comprises a group of settings that specifies fonts and sizes of certain interface elements, as well as colors. In the sample window of the Window Color And Appearance dialog box, click the screen element you want to change, and then use the lists and buttons at the bottom of the dialog box to make your color, font, and size selections. For title bars, you can specify two colors; Windows creates a gradient from Color 1 (at the left end of the title bar) to Color 2 (at the right end). The Item list includes some items that don't appear in the sample window, so you might want to review it in its entirety before you move on.

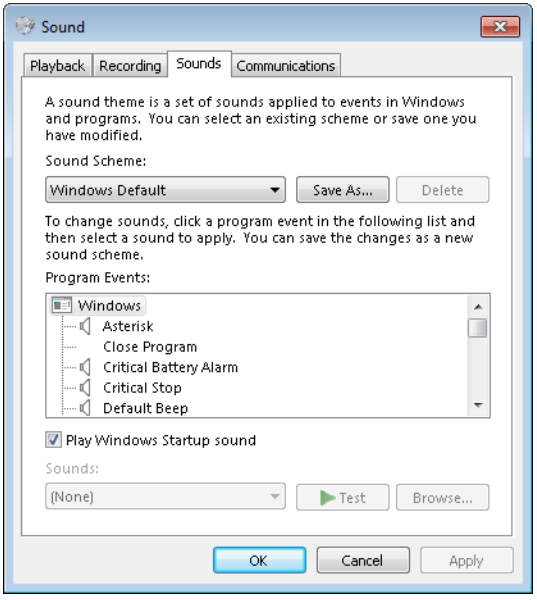
The Color button for each item opens a selection of standard colors. If you don't see the one you're looking for, click the Other button. Windows then displays a Color dialog box. Should you fail to find exactly the color you want in the Basic Colors palette, you can define your own custom colors. Change the color that appears in the Color box by adjusting the positions of the hue/saturation crosshair and the luminosity arrow or by specifying numeric values. When you have found the color you want, click Add To Custom Colors. If you want to replace an existing custom color, select it before you specify your new color.

CAUTION

The Window Color And Appearance dialog box itself has a distinctly twentieth-century appearance. The squared-off windows in its sample area betray its ancient heritage, and the text below the sample window gives fair warning. You won't find Undo or Default buttons anywhere. Experiment carefully and keep your own mental cookie trail. If you want to be absolutely sure you can find your way out of the woods, create a restore point before you proceed. (See "Configuring System Protection Options" on page 461.)

Selecting Sounds for Events

To specify the sounds that Windows plays as it goes through its paces, right-click the desktop, choose Personalize from the shortcut menu, and then click Sounds. In the Sound dialog box (shown here), you can select a predefined collection of beeps, gurgles, and chirps that Windows plays in response to various system and application events. Simply choose an item in the Sound Scheme list.



In the same dialog box, you can customize the sound schemes. To see what sounds are currently mapped to events, scroll through the Program Events list. If an event has a sound associated with it, its name is preceded by a speaker icon, and you can click Test to hear it. To switch to a different sound, scroll through the Sounds list or click Browse. The list

displays .wav files in %Windir%\Media, but any .wav file is eligible. To silence an event, select (None), the item at the top of the Sounds list.

If you rearrange the mapping of sounds to events, consider saving the new arrangement as a sound scheme. (Click Save As and supply a name.) That way, you can experiment further and still return to the saved configuration.

The Sound dialog box is also the place to silence the Windows Startup sound. Perhaps you've had this experience: You arrive a moment or two late for a meeting or class, discreetly turn on your computer at the end of the table or back of the room, and then cringe as your speakers trumpet your arrival. True, the Windows Startup sound is less raucous in Windows 7 than it was in Windows XP. But it's still a recognizable item, apt to cause annoyance in libraries, classrooms, concert halls, and other hushed venues. You can't substitute your own tune, but you can turn the startup sound off. In the Sound dialog box, clear the Play Windows Startup Sound check box.

INSIDE OUT

Mute your computer

If you like event sounds in general but occasionally need complete silence from your computer, choose No Sounds in the Sound Scheme list when you want the machine to shut up. (Be sure to clear the Play Windows Startup Sound check box as well.) When sound is welcome again, you can return to the Windows Default scheme—or to any other scheme you have set up. Switching to the No Sounds scheme won't render your system mute (you'll still be able to play music when you want to hear it), but it will turn off the announcement of incoming mail and other events.

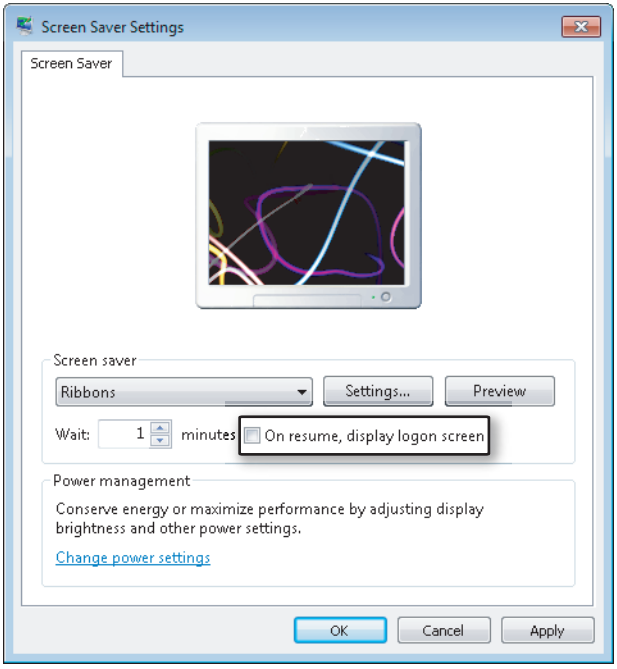
If you want to control sound levels on a more granular level—perhaps muting some applications altogether and adjusting volume levels on others—right-click the volume icon in the notification area and choose Open Volume Mixer. (Alternatively, click the icon and then click Mixer.) Volume Mixer provides a volume slider (and a mute button) for each output device and each running program that emits sounds.

Choosing a Screen Saver

Screen savers don't save screens. (In long-gone days when screens were invariably CRTs and many offices displayed the same application at all hours of the working day, having an image move about during idle times probably did extend the service life of some displays.) And they certainly don't save energy. But they're fun to watch. To see the current offerings, right-click the desktop, choose Personalize from the shortcut menu, and then click Screen Saver.

> **Note**
>
> **If you use a multimonitor setup, some of the screen savers supplied with Windows (specifically, 3D Text and Photos), unfortunately, "save" only the primary screen. The others go blank when the screen saver goes into action.**

The Screen Saver Settings dialog box (shown here) includes a handy On Resume, Display Logon Screen check box. If you work in an environment where privacy is not a big concern, you can save yourself some hassle by clearing this check box. (Password entry might also be required when your computer wakes from sleep; for details, see "Customizing a Power Plan" on page 164.)



Customizing Mouse Pointers

As you have undoubtedly noticed, Windows has dispensed with the time-dishonored hourglass mouse pointer. That might be a welcome development, particularly if you've logged a lot of hours with earlier versions of Windows. On the other hand, if you think an hourglass depicts the passage of time more unambiguously than a rolling doughnut, you can easily bring back the old shape. You can customize the entire array of pointer shapes your system

uses by right-clicking the desktop, choosing Personalize, and then clicking Change Mouse Pointers (in the left pane of Personalization, shown in Figure 4-12). On the Pointers tab of the Mouse Properties dialog box, you can select a pointer type in the Customize box, and then click Browse to select an alternative pointer shape. (The Browse button takes you to %Windir%\Cursors and displays files with the extensions .cur and .ani. The latter are animated cursors.)

Just as Windows encapsulates a collection of sound choices as a sound scheme, it wraps up a gamut of pointer shapes as a mouse-pointer scheme. The system comes with a generous assortment of predefined schemes, making it easy for you to switch from one set of pointers to another as needs or whims suggest. Figure 4-14 shows the list.

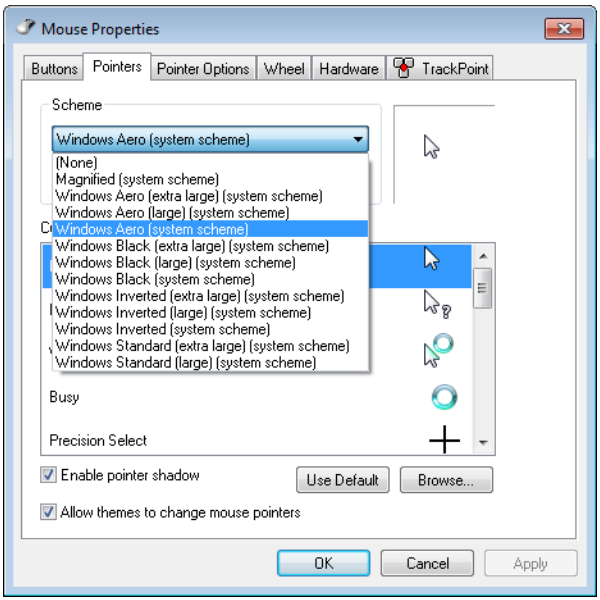


Figure 4-14 Some of the predefined mouse-pointer schemes are better suited for challenging light conditions than the default (Windows Aero) scheme.

If you sometimes use your portable computer in lighting conditions that make it hard for you to find the pointer, consider switching to one of the large or extra large schemes. If nothing else, those will give your eyeballs a larger target to pursue.

For something perhaps more novel than large or animated pointers, try one of the inverted schemes. These make your mouse pointer appear to pass behind the text on your screen rather than in front of it. (It's an acquired taste.)

If you're inclined to roll your own mouse scheme (by using the Browse button to assign cursor files to pointer types), be sure to use the Save As command and give your work a name. That way you'll be able to switch away from it and back to it again at will.

It's worth taking a minute or two to explore the remaining tabs in the Mouse Properties dialog box. Some of the more useful options there are Button Configuration (on the Buttons tab), which lets you swap the roles of the left and right mouse buttons; Display Pointer Trails, in the Visibility section of the Pointer Options tab (this one makes the mouse cursor even easier to find in lousy lighting conditions); and Select A Pointer Speed, in the Motion section of the Pointer Options tab. This last option governs the rate at which the pointer travels in response to mouse movement. If you have switched to a high-DPI setting (see "Making Text Easier to Read" on page 157) and a higher-resolution display, you might also need to increase the pointer speed to accommodate the increased number of pixels on your screen.

INSIDE OUT

Reconfigure the Caps Lock key to avoid shouting

If you occasionally find yourself accidentally stuck in Caps Lock mode, so that your e-mails are shouting or your text documents look like a letter from the IRS, consider the following simple tweak. Open Control Panel, click Change Keyboards Or Other Input Methods, and then click Change Keyboards. On the Advanced Key Settings tab of the Text Services And Input Languages dialog box, choose Press The SHIFT Key. This action makes the Caps Lock key behave as it did back in the typewriter era, so that pressing Shift turns off Caps Lock.

Note, however, that you can't have it both ways. If you make the Shift key turn off Caps Lock, then pressing Caps Lock repeatedly will still leave you in Caps Lock. If you want to get rid of the whole thing, so that Caps Lock does nothing whatsoever, open Registry Editor and navigate to HKLM\System\CurrentControlSet\Control\Keyboard Layout. Add a Binary value called Scancode Map. Set the data for this key to

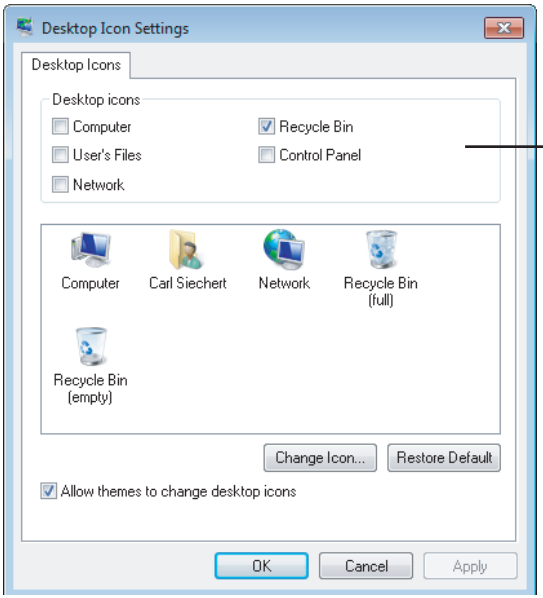
00000000 00000000 02000000 00003A00 00000000

Close Registry Editor, reboot, and you'll never be stuck in Caps Lock again.

Configuring Desktop Icons

A fresh, cleanly installed Windows 7 desktop (as opposed to one generated by an upgrade installation) includes a single lonely icon—Recycle Bin. If you want other system icons, right-click the desktop, choose Personalize, and click Change Desktop Icons (in the left

pane). The Desktop Icon Settings dialog box, shown here, provides check boxes for five system folders—Computer, the root folder of your own profile (User's Files), Network, Recycle Bin, and Control Panel.



If you're really into customization, you can change any of the five icons that appear in the large box in the center. Note that the Control Panel icon does not appear in this center box even if you select its check box; Windows doesn't provide a way to change it.

To change an icon, select it in the center box and click Change Icon. You'll find an interesting assortment of alternative icons in the file %Windir%\System32\Imageres.dll. (Be sure to use the horizontal scroll bar to see them all.) If none of these suit you, try browsing to %Windir%\System32\Shell32.dll.

Note

The icons you choose for system folders become part of a theme, if you save the configuration as described in the next section. However, other settings for desktop icons, including which ones you choose to display, their size, and their arrangement, are not saved in the theme file, allowing you to safely change themes without the risk of changing any of these customizations.

After you've populated your desktop with icons, you might want to control their arrangement. If you right-click the desktop, you'll find two commands at the top of the shortcut menu that can help in this endeavor. To make your icons rearrange themselves when you delete one of their brethren, click View and then click Auto Arrange Icons. To ensure that each icon keeps a respectable distance from each of its neighbors (and that the whole gang stays together at the left side of your screen), click View, Align Icons To Grid. And if your icons occasionally get in the way (for example, if you want to take an unimpeded look at the current desktop background image), click View, and then click Show Desktop Icons. (Return to this command when you want the icons back.)

INSIDE OUT

Customize icon spacing and size

If you're really into desktop icons, you might find it worthwhile to move the ones you have closer together—so that you'll have room for more or to keep the current collection from completely overrunning the desktop. The most effective way we've found to do this is by adjusting the icon size in the Window Color And Appearance dialog box for non-Aero themes. (In the Start menu search box, type color, and then click Change Window Colors And Metrics.) The Size setting for the Icon item, curiously enough, does not change the size of icons. (We explain how to change icon size in a moment.) The Size setting does change the icons' spacing, however. Reducing the value from the default 32 to 16 (the minimum) produces a compact icon display without sacrificing readability. You can also change the spacing, of course, with the Icon Spacing (Horizontal) and Icon Spacing (Vertical) items, which have a default value of 43.

To adjust the icon size, click the desktop, hold the Ctrl key, and then turn the mouse scroll wheel forward or back. This method produces a continuous zoom effect; if you want to get back to a standard size, right-click the desktop, click View, and select a size.

To change the sort order of your desktop icons, right-click the desktop and click Sort By. You can sort on any of four attributes: Name, Size, Item Type, or Date Modified. Sorting a second time on any of these attributes changes the sort order from ascending to descending (or vice versa).

Saving, Sharing, and Finding Theme Settings

If you've got all the visual and aural aspects of your profile set up just the way you want them, and you want to be able to experiment further but still return to the current settings, it's time to revisit Personalization (right-click the desktop and choose Personalize), shown earlier in Figure 4-12 on page 138. At the top of the themes list, in the My Themes category, you'll see Unsaved Theme if you made changes to whatever theme was previously in effect. To make those changes reusable, click Save Theme and supply a name. (The name you

furnish is the display name that appears in Personalization; you needn't follow restrictive file-naming rules that prohibit several common punctuation symbols.)

If you make additional changes, you'll once again generate an Unsaved Theme entry. There's no limit to the number of themes you can create. Windows saves each group of settings as a .theme file in your %LocalAppData%\Microsoft\Windows\Themes folder. (A .theme file is a standard text file that describes all the theme settings. For complete details about theme files, see "Creating and Installing Theme Files" at *w7io.com/0402*.) You can delete unwanted items from the My Themes list; simply right-click the item you no longer want and choose Delete Theme. Note that you can't delete the theme that's currently in use.

After you create a theme you like, you might want to use it on your other computers or share it with other users. Because a .theme file is just a text file, it doesn't contain the graphic images of your desktop, the sound files you use for various events, or other necessary files that make up the entire theme experience. For the purpose of sharing themes, Windows uses a .themepack file, which includes the .theme file as well as all other nonstandard theme elements. A .themepack file uses the standard compressed folder (.zip archive) format to envelop its component files. To create a .themepack file of an item in My Themes, first select it to make it the current theme. Then right-click it and choose Save Theme For Sharing. Unless you specify otherwise, Windows saves the .themepack file in the default save location of your Documents library.

To use a theme that was saved in .theme or .themepack format, simply double-click it. (Of course, a .theme file won't offer the full experience if the theme's components aren't available on your computer in folders to which you have access.)

Because themes are so easily portable, you can find many compelling Windows 7 themes online. Start your quest by clicking Get More Themes Online (under My Themes in Personalization), where Microsoft offers a nice selection.

CAUTION!

If you search for themes elsewhere on the Internet, be sure to download theme files only from people or companies you know and trust. Some theme elements (most notably, screen savers, which include executable program code) have long been notorious vectors for viruses and spyware. (A study released in 2009 by the security software vendor McAfee found "screen savers" to be the web's most dangerous search term, because the results pages often lead to malware downloads. As Windows 7 gains in popularity, searches for "free themes" are likely to produce risky results too. The study is available as a PDF file at *w7io.com/0403*.) Also, other types of malware could be disguised as a theme pack. (That is, you think that by double-clicking a file you're installing a theme, but you could in fact be installing a nefarious program instead.)

INSIDE OUT

Change the Windows logon screen

You won't find an option in Control Panel's Personalization tool that allows you to change the image that appears when you log on to Windows. You can change this aspect of the Windows interface, however, by making a small registry edit. For details, see "Customizing the Logon Screen" on page 670.

Configuring Your Display

The previous sections about themes and desktop backgrounds describe how to put eye-pleasing elements on your screen. Another important personalization step is to properly configure your display hardware for your purposes and preferences, which is the subject of the following sections.

Configuring Screen Resolution

Changing the screen resolution changes the number of pixels that Windows displays on your screen. Increasing the resolution—say, from 1024 by 768 to 1600 by 1200—lets you see more action on your display: more windows, more text, larger graphics, and so on—with various tradeoffs. Text at a given point size appears smaller at higher resolutions. A mouse at a given pointer speed requires more arm and wrist motion to traverse a high-resolution screen than a low-resolution one. And higher resolutions use more video memory. In short, the right resolution for you depends on your hardware, your preferences, and visual acuity.

To change the screen resolution, right-click the desktop and choose Screen Resolution. To make a change, click Resolution and drag the slider up or down. (See Figure 4-15.)

Note

A change in screen resolution affects all accounts at a particular computer, not just the account that makes the change.

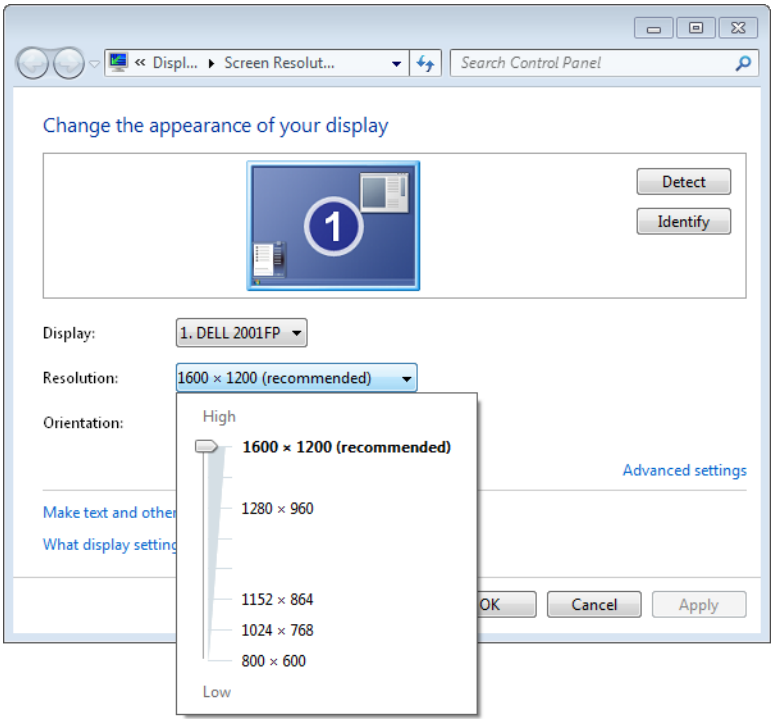


Figure 4-15 Click Advanced Settings to adjust the color depth or examine the drivers for the display adapter and monitor.

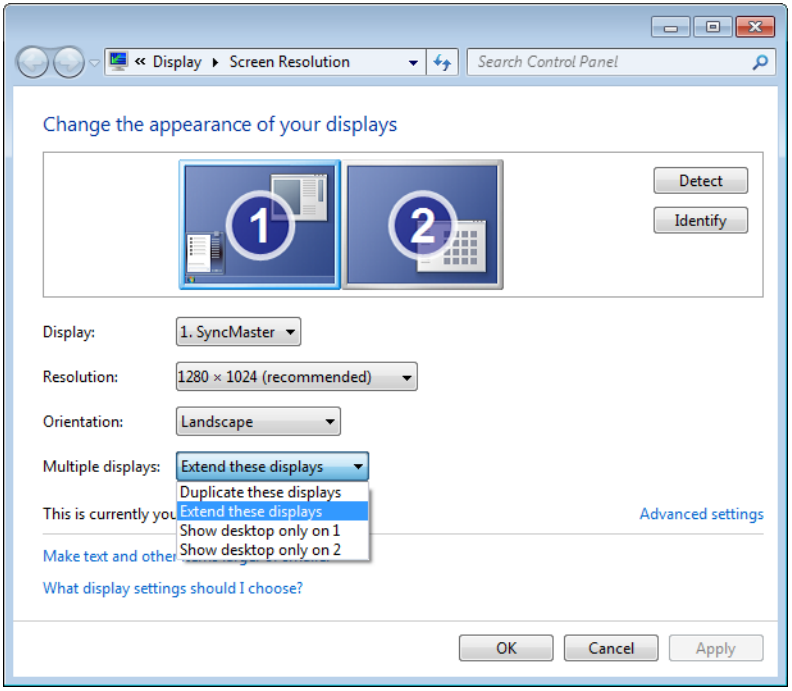
Configuring a Multimonitor Display

Extending your desktop across two or more monitors can be a great way to increase your productivity. You can do your main work on one screen and keep auxiliary information, e-mail, or even Windows Media Player open and visible on the second. Or if you work with large spreadsheets or database tables, you can spread them across multiple screens so that you can see more data without having to set your resolution to stratospheric levels.

If your display adapter supports two monitors (these days, most do), the Screen Resolution dialog box show two boxes, labeled 1 and 2, when you have a second monitor connected. (Of course, if you have more than two monitors attached, Windows displays a numbered box for each one.) You can click these boxes to configure the monitors independently. If adjusting the settings for monitor 1 appears to be affecting what you consider to be monitor 2, click Identify. Windows displays large white numerals on your screen temporarily

to let you know which screen is which. If it happens that screen 2 is on the left of screen 1, drag the boxes in Screen Resolution so that they match the physical layout of your monitors.

Assuming you want to add screen space to your visual layout, be sure to select Extend These Displays in Multiple Displays. If you prefer to have your second monitor function as a duplicate display (for example, to make a presentation easier for a group of clients to see), select Duplicate These Displays.



Some third-party programs exist to enhance your multimonitor experience. For example, with DisplayFusion from Binary Fortress Software *(w7io.com/0408)*, you can put a different desktop background on each monitor or have a single image span multiple monitors.

INSIDE OUT

Change multimonitor options with a keyboard shortcut

Windows logo key+P, the keyboard shortcut for switching to a network projector, also provides a quick and easy way to switch between multimonitor display arrangements.

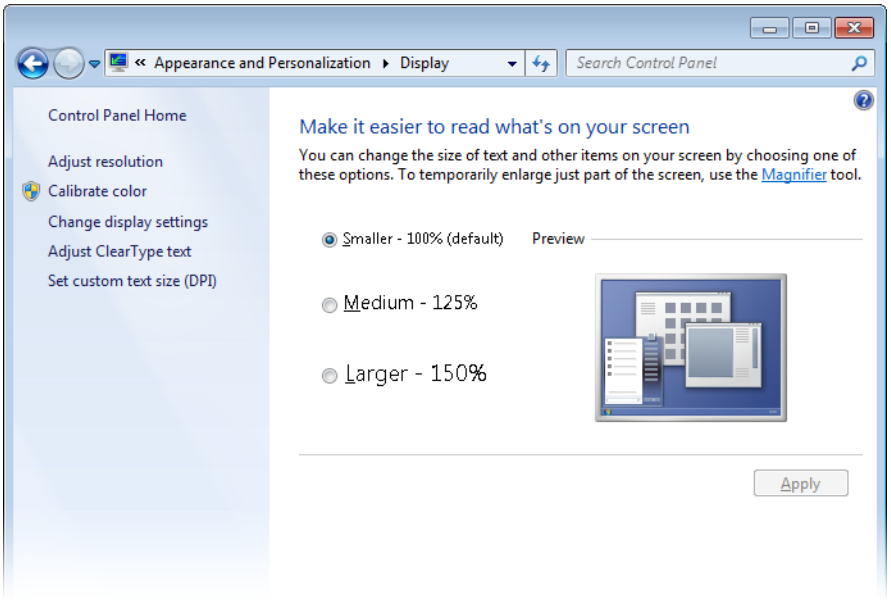
Making Text Easier to Read

In earlier versions of Windows, users who wanted larger text sometimes bumped up the point size for one or more screen elements. Scaling up this way was problematic, though, because not all elements of the Windows user interface could be scaled successfully. Dialog box text in particular was a problem, so users sometimes found themselves looking at large title bars and scroll bars and large menu text, but small dialog-box text. Windows 7 offers a better way.

If you like to work at high screen resolutions but you find yourself straining to read the text, you can try the following:

- Look for scaling ("zoom") commands in the text-centric programs you use. Many programs, including most modern word processors, include these scaling features. Scaling text up to a readable size this way is a good solution for particular programs but doesn't change the size of icon text, system menus (such as the Start menu), or system dialog boxes.
- To enlarge part of the screen, use the Magnifier tool. (For more information, see "Adjusting Ease of Access Options" on page 167.)
- Use the scaling options in the Display control panel—the "better way" offered by Windows 7. Adjusting the scaling to a higher level enables you to have readable text at higher screen resolutions.

To adjust display scaling, right-click the desktop and choose Personalize. In Personalization, click Display, a link in the left pane. (Alternatively, type **display** in the Start menu search box and click Display.) Select one of the options shown here:



For a greater range of settings, as well as greater precision, click Set Custom Text Size (DPI). (DPI stands for *dots per inch*.) Figure 4-16 shows the Custom DPI Setting dialog box.

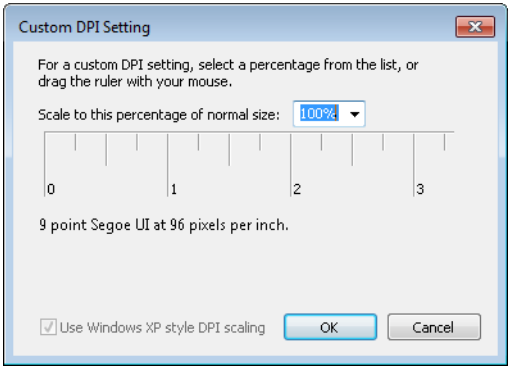


Figure 4-16 You can set the scaling from 100% to 500% of normal (96 DPI).

To change the scaling factor, drag any part of the ruler. Alternatively, you can select a value in the Scale To This Percentage Of Normal Size list or type directly in this box. What scaling factor is right? It depends on many things—the size and resolution of your screen, the

programs you use, your eyes, and your preferences. You will likely need to try more than one combination of screen resolution and scaling factor to get your system exactly the way that works best for you.

The Use Windows XP Style DPI Scaling check box offers a measure of compatibility for (mostly older) applications that are not written to use high DPI settings. Some compromise is required: when selected, some elements (dialog box text or icons, for example) might not align or resize properly, whereas clearing this option causes blurry text in some applications. By default, for a DPI setting of 120 (125%) or lower, the option is selected; for larger sizes it is cleared.

When you change DPI scaling, you must log off before the change takes effect. After you log on again, test some text-centric applications to see if you like the result. If you don't, return to the Display dialog box and try another setting.

TROUBLESHOOTING

Some programs produce fuzzy text

If you're running Aero and have applied a nondefault font scaling factor, some of your older programs might produce fuzzy text. Newer DPI-aware programs get information about the current scaling factor from the operating system and adjust themselves accordingly. Older applications that were not designed with DPI scaling in mind assume they are running under the default scale of 96 DPI, and the operating system scales them. A side effect of this is that fonts and icons can sometimes appear fuzzy. If you find a particular program's display unsatisfactory, right-click its entry in the Start menu, choose Properties from the shortcut menu, and click the Compatibility tab. In the Settings section, select Disable Display Scaling On High DPI Settings.

Using Font Smoothing to Make Text Easier on the Eyes

ClearType is a font-smoothing technology that reduces jagged edges of characters, thus easing eye strain. Although it is optimized for LCD (flat panel) displays, ClearType is turned on by default on all systems, regardless of display type. Microsoft believes that ClearType improves readability on both cathode-ray tube (CRT) and LCD displays, but if you're a CRT user you should probably try turning ClearType off to see which works better for you. (You can also turn font-smoothing off altogether by clearing the Smooth Edges Of Screen Fonts check box on the Visual Effects tab of Performance Options, but it's hard to imagine any benefit from doing so.)

To check or change your font-smoothing settings, type **cleartype** in the Start menu search box, and then click Adjust ClearType Text. Doing so opens the ClearType Text Tuner, which,

in its first screen, has a check box that turns ClearType on when it is selected. The ensuing screens that appear each time you click Next offer optometrist-style choices ("Which is better, number 1 or number 2?") to help you reach ClearType perfection.

Windows includes seven new fonts that are optimized for ClearType. The names of six of these—Constantia, Cambria, Corbel, Calibri, Candara, and Consolas—begin with the letter *c*—just to help *c*ement the *c*onnection with *C*learType. If you're particularly prone to eye fatigue, you might want to consider favoring these fonts in documents you create. (Constantia and Cambria are serif fonts, considered particularly suitable for longer documents and reports. The other four are sans serif fonts, good for headlines and advertising.) The seventh ClearType-optimized font, Segoe UI, is the typeface used for text elements throughout the Windows user interface. (Windows also includes a ClearType-optimized font called Meiryo that's designed to improve the readability of horizontally arrayed Asian languages.)

For information about how ClearType works, visit Microsoft's ClearType site, at *w7io.com/0404*.

Calibrating Your Display's Colors

To get the most accurate rendition of images and colors on your screen, you should calibrate it. You've probably noticed, but perhaps not fiddled with, the buttons on your monitor that control various display settings. A new tool included with Windows 7, Display Color Calibration, helps you to calibrate your screen using your monitor's display controls as well as various Windows settings. With Display Color Calibration, you set gamma, brightness, contrast, color balance, and other settings, all of which are explained in the on-screen descriptions.

To run Display Color Calibration, in the Start menu search box, type **display** and then click Calibrate Display Color. (Even easier, type **dccw**, the name of the executable file for Display Color Calibration, and press Enter.) Calibrate Color is also an option in the Display control panel. No matter how you start it, Display Color Calibration opens a full-screen application that leads you through the steps of adjusting your display by making settings and adjusting monitor controls until the images displayed at each step look their best.

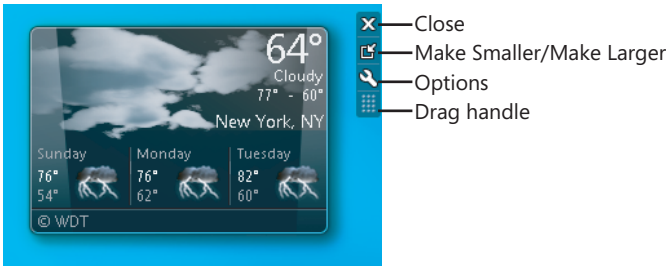
Using and Customizing Desktop Gadgets

One of the most conspicuous new features in Windows Vista was Windows Sidebar, a repository for miniprograms (called *gadgets*) that can amuse, inform, and distract you all day long. Windows 7 continues to support gadgets, but they're no longer constrained to the sidebar along one edge of your screen; they can be scattered anywhere on your desktop.

You can easily add or remove gadgets whenever you feel the need for something new on your computer screen. The gadget gallery that comes with Windows includes about a dozen offerings, but it has a handy link to a much larger online gallery.

To add a gadget to your desktop, right-click the desktop and choose Gadgets to summon the gadget gallery.

For clues about what a gadget might do, select it and click Show Details. To install a gadget, you can either drag it to the desktop or right-click it and choose Add. After you have installed a gadget, you'll probably want to prod it with your mouse (try both buttons, and click on various parts) to see what tricks it knows and what options it offers. Each gadget is different, but they're all designed to make their features discoverable. Many gadgets sprout a wrench icon when you point to them; click it to make settings and customizations. Some gadgets (Weather, for example) include a Make Smaller or Make Larger icon, which changes the amount of information the gadget displays.



Many gadgets rely on online updates (weather and stocks, for example). When you don't have an Internet connection, these gadgets show information from the last online update and include a time stamp at the bottom that shows how old the data is.

To remove a gadget, click the Close button. Gadgets that you close remain in the gallery for easy recovery; if you want to remove a gadget from your computer, open the gadget gallery, right-click the gadget, and choose Uninstall. If you'd rather hide your gadgets temporarily without removing them, right-click the desktop and choose View, Show Desktop Gadgets to remove the check mark and hide your gadgetry.

To get to the online gadget site, click Get More Gadgets Online in the bottom right corner of the gadget gallery. If you download a gadget from this site, it takes up residence in the gallery, so you can easily close it and reopen it whenever you want. The search box in the gadget gallery is also a list. By opening the list, you can filter the gallery to show recently installed gadgets or gadgets from particular publishers.

INSIDE OUT

Display desktop gadgets with a single keystroke

Bring all your gadgets to the foreground at any time by pressing Windows logo key+G. If you want to view just your gadgets without the clutter of other open windows, press Windows logo key+D. (Press it again to restore the windows.)

Setting Power and Sleep Options

Do power settings really make a difference? In a word, yes. You can not only achieve greater battery life on a portable computer with the appropriate settings, but you can save considerable amounts of energy on desktop computers. The green effect of reducing power consumption can be significant, whether you interpret "green" to mean saving dollars or saving the environment. Microsoft has published a white paper that describes the changes in Windows 7 power management and helps you to assess the energy savings, financial savings, and environmental savings of proper power management; download it from *w7io.com/0405*. You can calculate your own savings by using the Energy Star Computer Power Management Savings Calculator, a Microsoft Excel spreadsheet you can download at *w7io.com/0406*.

Selecting a Power Plan

Power management in Windows 7 is significantly different from power management in Windows XP, both in its user interface and in its under-the-hood operation. Windows provides three predefined power plans, and some computer manufacturers include additional predefined plans. To select a power plan, open Power Options (in the Start menu search box, type **power** and click Power Options), shown in Figure 4-17.

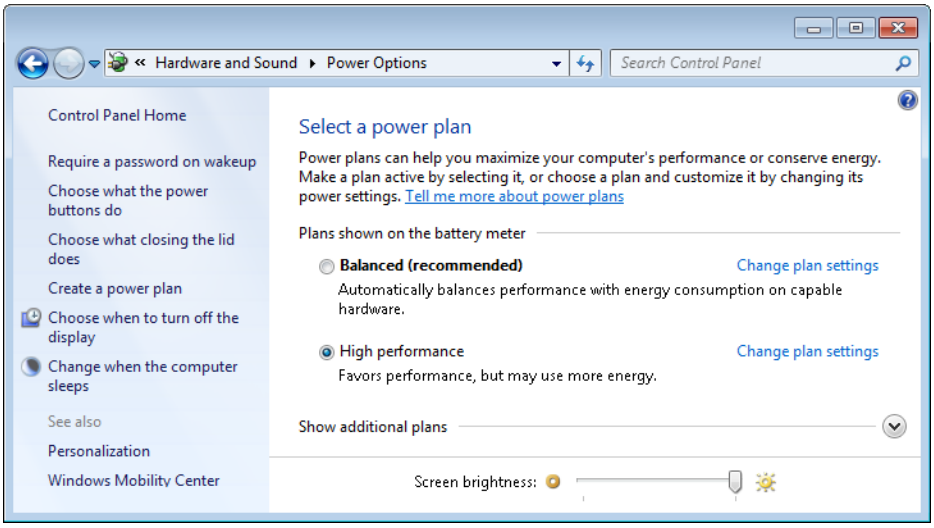
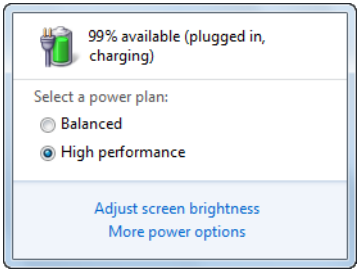


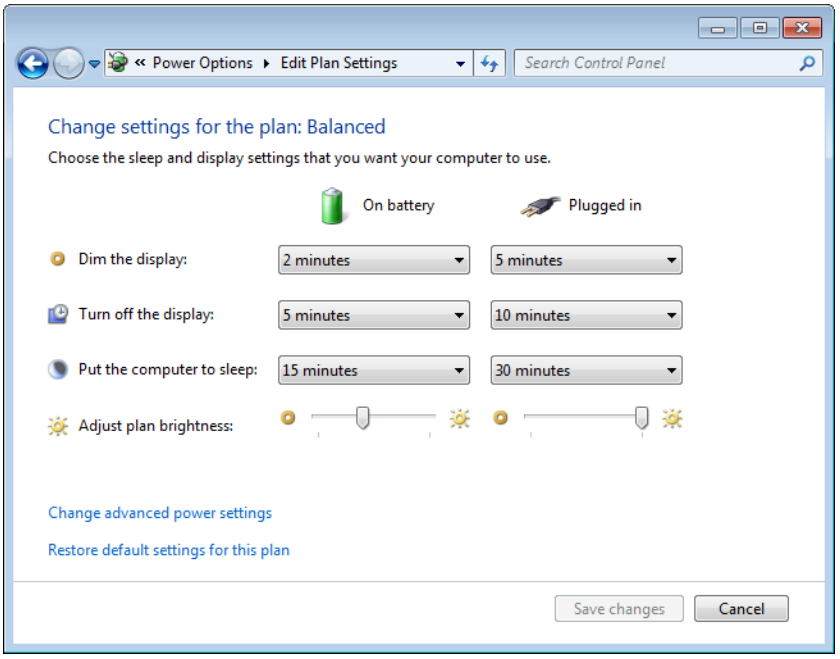
Figure 4-17 Use the Create A Power Plan link in the left pane to add to the list of ready-made power schemes. Click Change Plan Settings to adjust individual options for a plan.

On a portable computer, there's an easier way to switch plans: click the Power icon in the notification area and make your selection.



Customizing a Power Plan

To customize the current power plan, click one of the links in the left pane of Power Options or click Change Plan Settings next to the name of any plan. As you dig into Power Options, you'll discover a wealth of useful settings, especially on notebook computers, where you can make adjustments that are different based on whether a system is running on batteries or on AC power.



You can do additional fine-tuning by clicking Change Advanced Power Settings in the window shown.

Note

If you've made changes to a predefined power plan, you can restore its default settings by clicking Change Plan Settings and then clicking Restore Default Settings For This Plan. Not sure what those default settings are? The United States Environmental Protection Agency will tell you; visit *w7io.com/0407*.

Understanding Sleep States

When you click Choose What The Power Buttons Do (in the left pane of Power Options), you'll see that for each power switch, you can specify Do Nothing, Sleep, Hibernate, or Shut Down. What do these terms mean?

- Do Nothing disables the switch.
- Sleep switches to a low-power sleep state that allows quick resumption.
- Hibernate copies an image of memory to the hard disk and powers off the computer, enabling you to return to where you left off.
- Shut Down performs an orderly shutdown of Windows and switches off the power.

By default, when you choose Sleep, Windows 7 uses *hybrid sleep*, which combines the benefits of the low-power sleep state (the system uses just enough power to keep everything in volatile memory, ready to resume quickly) and hibernation (saves the contents of memory to a hard disk so that nothing is lost if power is shut off or the battery drains completely).

Setting Power Options with Powercfg

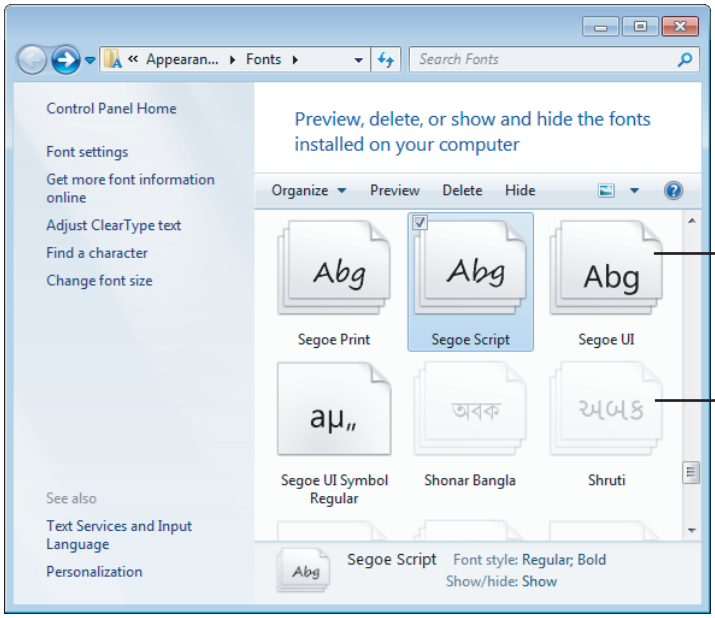
Windows 7 includes a command-line program called Powercfg that enables you to incorporate routine power-setting changes in scripts or batch files. This power user's power-management tool includes options that are not available in the graphical user interface. To see the full range of Powercfg's capabilities, open an elevated Command Prompt window (right-click Command Prompt and choose Run As Administrator). Then type **powercfg /?**. You might want to redirect output from this query to a text file (for example, by appending **>powercfg helptext.txt** to the command), because the list of options is long. Here are some you might find useful:

- To change the monitor timeout, disk timeout, standby timeout, or hibernate timeout value in the current power scheme, use **powercfg –x** *setting value*.
- To make a particular power scheme active on the system, use **powercfg –s** *Scheme_GUID*.
- To retrieve the name of the current power scheme, use **powercfg –getactivescheme**.
- To enable or disable hibernation, use **powercfg –h [on|off]**. Note that this is the only way to completely disable hibernation.
- To generate a report analyzing the system for common energy-efficiency and battery-life problems, close all applications, and then type **powercfg –energy.** After the program finishes running and the command prompt returns, type **energy-report.html**, and a diagnostic report opens in your web browser.

Working with Fonts

The days when your choice of fonts ended just beyond Arial and Times New Roman are long gone; if you include all the language variants and style variants (bold, italic, and so on), Windows 7 comes with hundreds of fonts. Something else that is gone (and won't be missed): the Add Fonts dialog box, which has been in every version of Windows virtually unchanged since Windows 3.1.

The headquarters for font management is Fonts in Control Panel, which is shown next. From this list of fonts, you can select a font (or a font family, which appears as a stack) and then click Preview to open a window that shows the font's characters in sizes ranging from 12 point to 72 point. (A *point* is a printer's measurement that is still used in modern digital typography. There are 72 points to an inch.)



A stack indicates multiple fonts in a font family (italic, bold, and so on)

Dim text indicates a hidden font, which is one designed for an input language you don't use. Hidden fonts don't appear in application font lists.

The primary font format used by Windows is OpenType, which is a format jointly developed by Microsoft and Adobe as an extension of Apple's TrueType format. Windows also supports TrueType fonts and PostScript Type 1 fonts. To install a new font, you can drag its file from a folder or compressed .zip archive to Fonts in Control Panel. But it's not necessary to open Fonts; the simplest way to install a font is to right-click its file in Windows Explorer and choose Install. Because font file names are often somewhat cryptic, you might want to double-click the file, which opens the font preview window, to see what you're getting. If it's a font you want, click the Install button.

CAUTION!

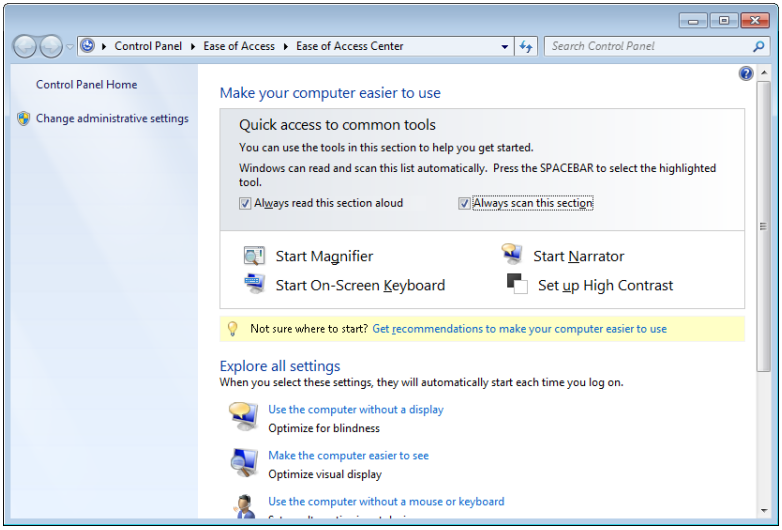
Download and install fonts only from people or companies you know and trust.

Note

PostScript Type 1 fonts normally consist of two or three files. The one you use to install the font—regardless of which method you use—is the .pfm file, whose file type is shown in Windows Explorer as Type 1 Font File.

Adjusting Ease of Access Options

The Windows family has a longstanding commitment to making computing accessible and easier to use for persons with vision, hearing, or mobility impairments. Windows 7 groups these options into the Ease Of Access Center, which you can find in Control Panel or by using its keyboard shortcut, Windows logo key+U.



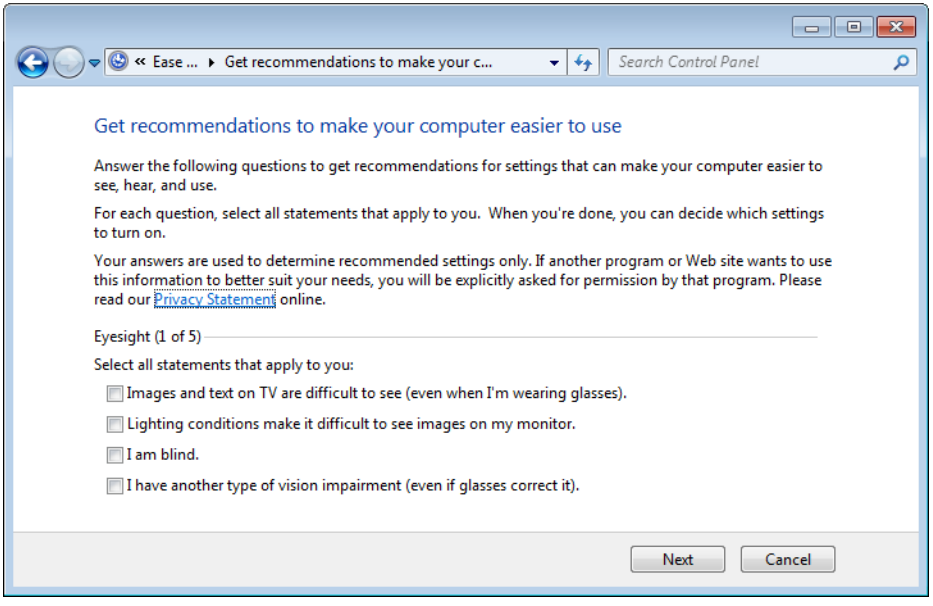
The Ease Of Access Center provides a prominent link to each of the following tools, which can be used alone or in combination:

- **Magnifier** This tool enlarges part of the screen, making it easier for persons with vision impairments to see objects and read text. (You can also launch Magnifier with a

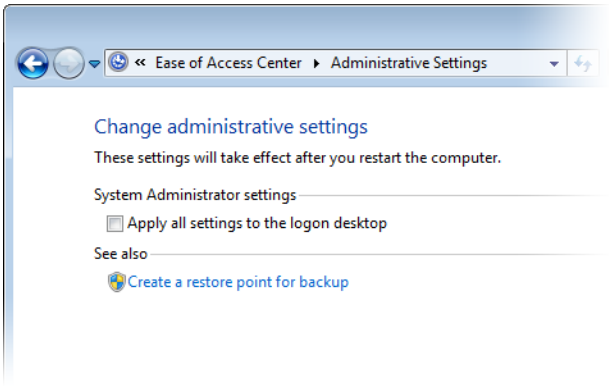
keyboard shortcut: Press Windows logo key+plus sign to launch it and zoom in. Press again to zoom in more, or press Windows logo key+minus sign to zoom out.)

- **Narrator** This tool converts on-screen text to speech and sends it to your computer's speakers. This option allows people who are blind or have severe vision impairments to use Windows.
- **On-Screen Keyboard** This tool provides an alternate means for Windows users with impaired mobility to enter text using a pointing device. Options that appear when you click Options let you control how On-Screen Keyboard works—you can choose whether to select a letter by clicking, for example, or by allowing the pointer to pause over a key for a specific amount of time.
- **High Contrast** This tool uses a high-contrast color scheme (by default, white text on a black background) that makes it easier for visually impaired users to read the screen.

Many more tools—including Windows stalwarts Mouse Keys (uses the numeric keypad to control the mouse pointer), Sticky Keys (lets you press key combinations one key at a time), and Filter Keys (ignores repeated keystrokes)—are available through links at the bottom of the Ease Of Access Center. However, the easiest way to configure your computer for adaptive needs in one fell swoop is to click Get Recommendations To Make Your Computer Easier To Use, a link near the center of the page. The link launches a wizard, shown here, that walks you through the process of configuring accessibility options.



If you want accessibility options to be available at all times, even before logging on to the computer, click the Change Administrative Settings link in the left pane of the Ease Of Access Center. This option (shown next) applies any changes you make to the logon desktop. If you choose not to enable this option, you can still turn accessibility features on or off at the logon screen; click the small blue Ease Of Access icon in the lower left corner of the logon screen to display a list of available settings, and then press the Spacebar to enable each one.



Windows 7 offers another useful accessibility tool in speech input. For details, see "Using Speech Recognition and Voice Commands" on page 1148.

CHAPTER 5

Adding, Removing, and Managing Programs

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You don't need a wizard or a Control Panel applet to install an application in Windows 7. Setting up a new program from a CD or DVD is typically a straightforward matter of inserting the disc and following the instructions that appear courtesy of your AutoRun settings. Setting up a program that you download is usually a matter of clicking Run or Open after the download has finished. In neither scenario do you need a wizard to hold your hand.

That's the theory, at any rate. In practice, there might be hurdles to surmount or hoops to jump through when it comes to installing programs. Potential complications come in two flavors:

- User Account Control (UAC)
- Compatibility issues

The first of these is usually no more than a minor annoyance. The second can be vexatious, but it usually arises only with programs designed for an earlier generation of operating system.

In this chapter, we'll survey the hoops and hurdles and everything else having to do with the addition, removal, updating, and management of applications in Windows 7. We'll also look at Windows XP Mode, a free download for Windows 7 (Professional, Enterprise, and Ultimate) that can let you run legacy applications that can't run directly in Windows 7.

What's in Your Edition?

With the exception of Windows XP Mode, all of the tools and techniques described in this chapter are available in all editions of Windows 7. Windows XP Mode requires Windows 7 Professional, Windows 7 Ultimate, or Windows 7 Enterprise.

Dealing with User Account Control

Rare exceptions aside, the rule in Windows 7 is this: To install a program, you need administrative credentials. Software installers—the programs that install programs—typically create files in system folders (subfolders of %ProgramFiles%) and keys in protected registry locations, and these are actions that require elevated privileges.

Installing the program files and registry keys in protected locations protects your programs (hence, you) from tampering by malicious parties, but unless you have disabled User Account Control altogether, you need to deal with UAC prompts to complete the process. If you install a program while running under an administrative account, a UAC prompt will request your consent for the actions the installer is about to undertake. If you install while running under a standard account, you will be asked to supply the name and password of an administrative user.

For more information about User Account Control, see "Preventing Unsafe Actions with User Account Control" on page 629.

Windows 7 employs installer-detection technology to determine when you have launched an installation process. This technology enables the operating system to request credentials at the time the process is launched rather than wait until the installer actually attempts to write to a protected location.

The system presumes that any process with a file name containing particular keywords (such as *install*, *setup*, or *update*) or whose data includes particular keywords or byte sequences is going to need elevated privileges to complete its work, so the UAC prompt appears as soon as the installer process begins. After you have satisfied the UAC mechanism, the process runs in the security context of TrustedInstaller, a system-generated account that has access to the appropriate secure locations.

The same technology that detects an installation process also recognizes when you're about to update or remove a program. So you can expect to see UAC prompts for these activities as well.

INSIDE OUT

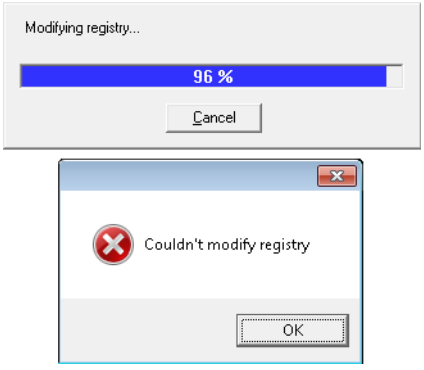
Turn off Start menu notifications

After you install a program, Windows announces additions to the Start menu by highlighting the changes on the menu itself. It's reasonably intelligent about this; it doesn't highlight additions that aren't programs (shortcuts to documents, for example), it removes the highlight for items that you ignore for at least a week, and it doesn't highlight anything that you install within an hour of installing Windows itself. Nevertheless, some users would rather it didn't highlight any Start menu changes. If you're in that camp, right-click the Start button and choose Properties. On the Start Menu tab of the Taskbar And Start Menu Properties dialog box, click Customize. Then, in the Customize Start Menu dialog box, clear Highlight Newly Installed Programs.

TROUBLESHOOTING

No UAC prompt appears, and the install fails

If installer-detection technology fails to detect your installer, and if your installer tries to write to a protected area (in file storage or the registry), your setup will fail—typically with an error message like this:



To solve this problem, first do whatever is necessary to back out of the failed installation (click OK, Exit, Cancel, or whatever else seems appropriate). Then try to find the executable file for the installer. It will *not* be named Setup or Install (because if it were, it would not have evaded the detector), but it will be an .exe file. When you find it, right-click it in Windows Explorer and choose Run As Administrator. Supply your administrative credentials, and let the installer run.

TROUBLESHOOTING

The setup process hangs on reboot

If you launch a setup program as a standard user and supply the name and password of an administrative account, and if the setup program requires a system reboot to complete installation, you might not be able to finish the installation unless you log back on (after the reboot) as that administrative user, rather than under your own standard-user account. Installer routines that include a reboot typically record post-reboot instructions in the registry key HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnce. The value of the RunOnce key is, as the key name suggests, run one time—and then discarded. The hitch is that RunOnce values are executed only when an administrator logs on. If you log on as a standard user, the RunOnce instructions are ignored, and your setup process might appear to hang. The solution is to log off and log back on as an administrator. To forestall problems of this kind, you might want to adopt the practice of elevating your own account to administrative status, using the User Accounts section of Control Panel, before you begin installing applications. Afterward, if you're more comfortable running as a standard user, you can return to Control Panel and demote yourself.

Dealing with Compatibility Issues

Most recent application programs should install and run without problems in Windows 7. Certain older ones might not. Windows 7 attempts to recognize potential compatibility problems *before* you install. Immediately after running a program's installer, you might, for example, see a message like the one shown in Figure 5-1.

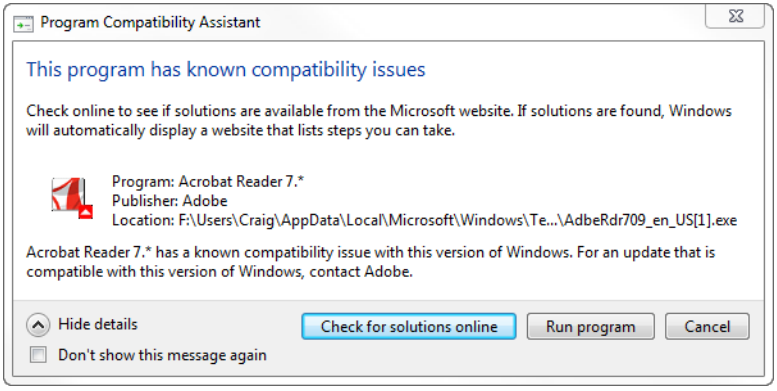


Figure 5-1 Windows flags some potential compatibility problems and recommends solutions before you install.

Problems of this kind commonly arise if you try to install an outdated version of an application. In such cases (as in this example), clicking Check For Solutions Online takes you to the application vendor's website, where you can download a later version that will run with no problem in Windows 7. If you're sure that no help is available online, however, and you want to try installing the software despite the potential compatibility problem, click Run Program.

If an installation routine runs but fails for any reason to complete successfully (in some cases, even if you simply cancel out of the setup process), you will likely see a Program Compatibility Assistant message, comparable to the one shown in Figure 5-2. If the Assistant is mistaken and you really have successfully installed your program, click This Program Installed Correctly. Otherwise, click Reinstall Using Recommended Settings. The Program Compatibility Assistant will then apply one or more compatibility tweaks (unfortunately, without telling you what it's doing) and try again to run your installer.

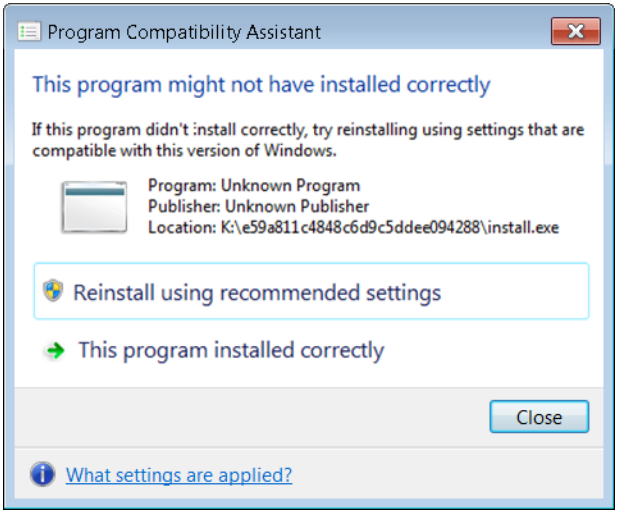


Figure 5-2 The Program Compatibility Assistant appears when an installation program does not reach a successful conclusion.

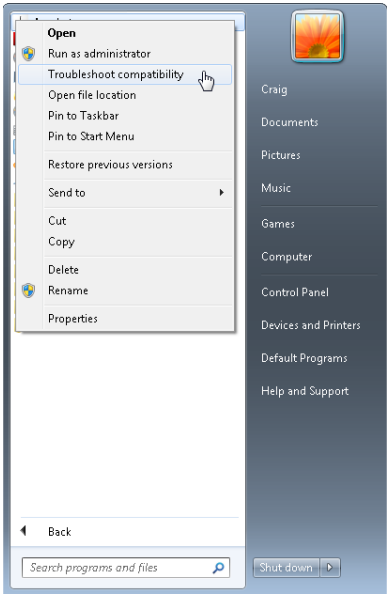
In some cases, a program written for an earlier version of Windows might install successfully but still not run well. In such situations, the Program Compatibility troubleshooter is your friend. This wizard lets you take measures designed to convince your program that it's running in the environment for which it was designed.

To run the Program Compatibility troubleshooter, open Programs in Control Panel. Then, under Programs And Features, click Run Programs Made For Previous Versions Of Windows. The wizard will try to detect which program or programs are giving you problems, but if it doesn't find them, you can choose from a list of running programs. Then follow the step-by-step instructions.

INSIDE OUT Set a restore point

The setup routines for most recent programs automatically create a restore point before making any changes to your system. A restore point is a snapshot of your current system state. If an installation destabilizes your system, you can use System Restore to return to the snapshot state. (For more information about using System Restore, see "Configuring System Protection Options" on page 461 and "Making Repairs with the Windows Recovery Environment" on page 1046.) The installers for some older programs do not create restore points, unfortunately, and it is precisely these older programs that present the most potential hazard. If you're about to install a program that's not of recent vintage (say, one written for Windows 9*x*), it's not a bad idea to create a restore point manually before you begin. (Open System And Security in Control Panel, click System, click System Protection in the left pane, and then click Create. Bring along your administrative credentials.)

With some programs, you can go straight to the Program Compatibility troubleshooter by right-clicking the program's shortcut on the Start menu (or the desktop) and choosing Troubleshoot Compatibility:



As an alternative to using the Program Compatibility wizard, you can modify the properties of the program's shortcut. Open the Start menu, find the program you want to adjust, right-click its Start menu entry, and choose Properties from the shortcut menu. Then click the Compatibility tab. Figure 5-3 shows an example of what you'll see.

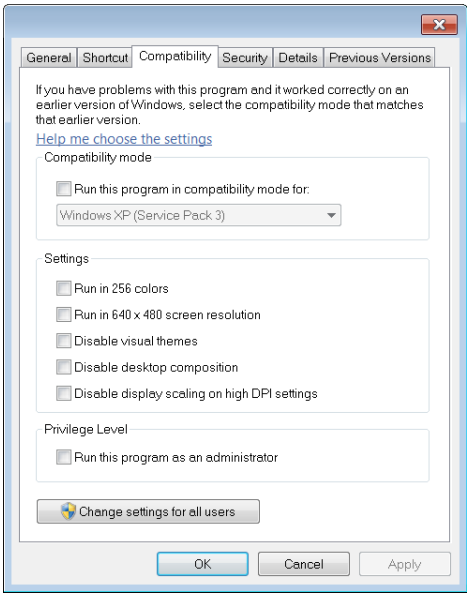


Figure 5-3 Options on the Compatibility tab of a program shortcut's properties dialog box might enable some older programs to run in Windows 7.

Select the Run This Program In Compatibility Mode For check box, and then choose one of the available operating system options. Use the Settings options to deal with programs that experience video problems when run at higher resolutions and color depths.

Some programs work properly only when run with administrative privileges. Although Microsoft has been advising developers for years to avoid this requirement except for applications that perform administrative functions, this advice was routinely ignored in an era when nearly all user accounts were administrator accounts—the usual situation on computers running Windows XP. You can get these programs to run properly by selecting Run This Program As An Administrator. Although the program runs, it's not without some inconvenience: you'll need to respond to a UAC elevation prompt every time you run the program.

Running Legacy Applications in Windows XP Mode

Windows XP Mode is an optional download for the Professional, Enterprise, and Ultimate editions of Windows 7 that consists of a licensed copy of Windows XP with Service Pack 3, saved in Microsoft Virtual Hard Disk Image (.vhd) format. When run in Windows Virtual PC or another compatible software program, this virtualized installation of Windows XP allows you to run mission-critical applications that might not run satisfactorily in Windows 7. Windows XP Mode is also suitable for developers who need to test applications in older environments without devoting physical hardware to the task. You can, for example, run an older version of Internet Explorer on the same desktop with Internet Explorer 9, or Microsoft Office 2003 alongside Office 2010—feats that would be impossible without the virtualized earlier operating system. Windows XP Mode also comes in handy if you happen to have an older device with a proprietary driver that hasn't been updated for Windows Vista or Windows 7. If it worked great in Windows XP but doesn't work in Windows 7, don't throw it out; install it in Windows XP Mode.

> **Note**
>
> **When Windows Virtual PC was first released, it required a computer with hardware-assisted virtualization (HAV), which means the microprocessor has to support either Intel Virtualization Technology (Intel VT) or AMD Virtualization (AMD-V). With the release of an updated version of Windows Virtual PC in 2010, that is no longer the case. Nonetheless, you'll see better Windows XP Mode performance on a system with HAV. To determine if your computer supports HAV and see if it's enabled, download and run the hardware-assisted virtualization detection tool from *w7io.com/20501*. Note that HAV must be enabled in the BIOS; it's often disabled by default. Instructions for enabling HAV on several popular computer brands can be found at *w7io.com/20502*.**

Downloading and Installing Windows XP Mode

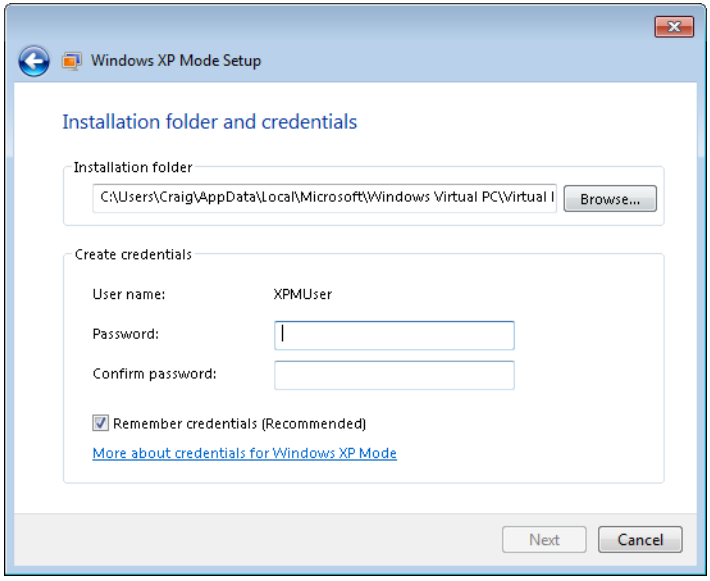
Setting up Windows XP Mode requires two free downloads—first is a small download that enables the Windows Virtual PC host program, followed by a separate download that installs, configures, and activates the licensed copy of Windows XP SP3. Follow these steps:

1. Go to *w7io.com/0502* and click Download Windows XP Mode And Windows Virtual PC.
2. Select your Windows 7 system type (32 bit or 64 bit) and language.
3. Follow the website's instructions to download and install Windows Virtual PC and then Windows XP Mode.

4. Restart your system.

5. Launch Windows XP Mode by opening the Start menu, choosing All Programs, clicking Windows Virtual PC, and then clicking Windows XP Mode.

6. Accept the license agreement, and then enter a password for the default administrative account:



If you select Remember Credentials (Recommended) in this dialog box, whenever you launch Windows XP Mode from your Windows 7 desktop or Start menu, you'll be logged on automatically with the saved credentials.

7. Allow the setup process to complete, and then customize and secure your new Windows XP installation to suit your needs and preferences. If you create additional user accounts, be aware that the system will let you create accounts without passwords but won't let you log on to those accounts.

Running Windows XP Mode

To launch the virtualized Windows XP environment, open the Start menu, click All Programs, and then click the Windows Virtual PC folder. There you'll find a shortcut for Windows XP Mode. This action launches Windows Virtual PC, which in turn hosts Windows XP Mode. As Figure 5-4 shows, the Windows XP environment appears initially as a window on your Windows 7 desktop.

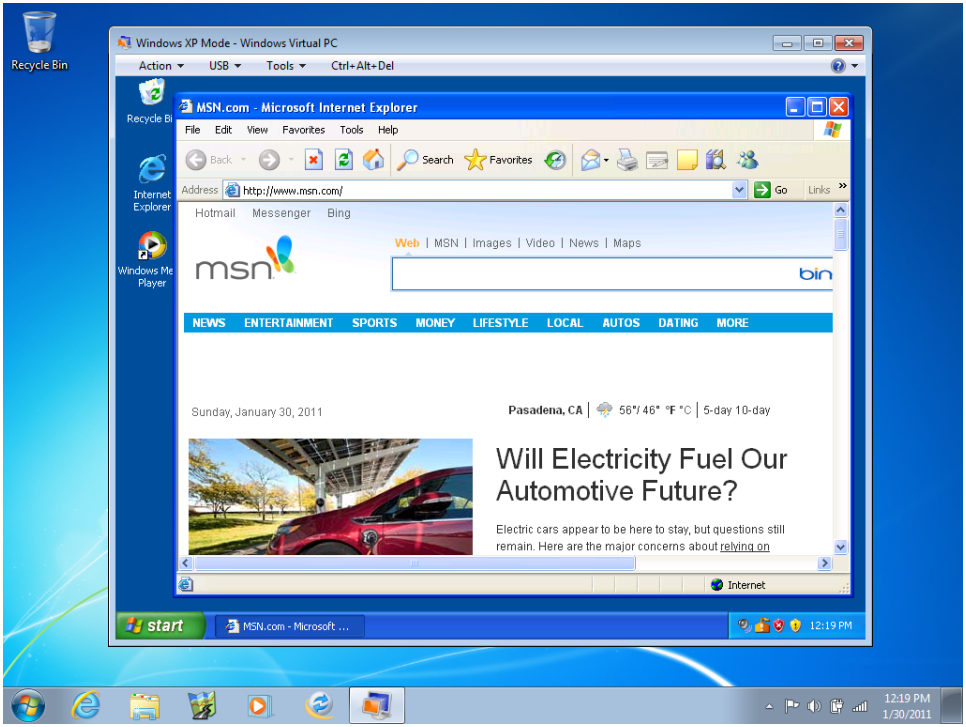


Figure 5-4 Windows XP Mode, shown here running Internet Explorer 6, runs initially as a window on your Windows 7 desktop. You can kick it into full-screen mode with a command on the Action menu.

To turn the full screen over to the virtual environment and remove its own window frame, either maximize it or open the Action menu and choose View Full Screen. In full-screen mode, the menu bar at the top of the Windows XP Mode window appears, in slightly modified form, as a toolbar on the desktop. Click the Restore button on this toolbar to return to windowed display.

To end a Windows XP Mode session, click the Close button on the Windows XP Mode window or its counterpart on the full-screen toolbar. Initially, the virtual environment is configured to hibernate when closed. If that doesn't suit you, choose Settings on the Tools menu, and then click Close in the Windows XP Mode—Windows Virtual PC Settings dialog box. Options here include Hibernate, Shut Down, Turn Off, and Prompt For Action. (See Figure 5-5.)

The advantage of hibernating, of course, is that it enables you to restart the XP environment quickly. If you switch to Shut Down, a click of the Close button generates an orderly shutdown sequence, with prompts to save unsaved work. Turn Off, in contrast, simply pulls the plug on the virtual machine—no questions asked. Turn Off might be a little drastic as a default close option, but if you configure the environment to prompt on close, Turn Off is

handy for those times when you want an immediate shutdown and have nothing important to save.

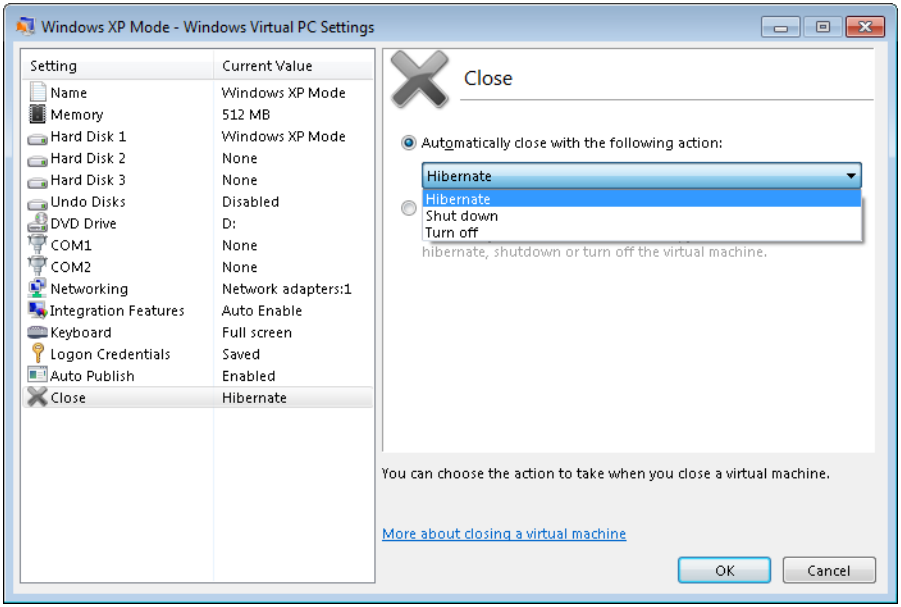


Figure 5-5 For the sake of speedy restarts, the virtual environment, by default, hibernates when you close it.

Installing Applications

Windows Virtual PC is configured by default to share your computer's optical drives with Windows 7. While the virtual environment is running, AutoRun is disabled. To install an application from a CD or DVD in Windows XP Mode, therefore, run the virtual environment, pop in the disc, open My Computer in Windows XP, and run the application's setup program.

After you have installed a program in this manner, Windows Virtual PC (in its default configuration) publishes that program to Windows 7. Thereafter, you can run it "seamlessly" by launching it from the Windows 7 Start menu. As Figure 5-6 shows, applications installed in Windows XP Mode are given Start menu shortcuts in the folder Windows XP Mode Applications.

Applications installed in Windows XP Mode and launched from the Windows 7 Start menu run on the Windows 7 desktop, without visible Windows XP Mode paraphernalia. This is done by running the applications in a Terminal Services session in the virtualized Windows XP machine; the Windows 7 host accesses the session by using Remote Desktop Protocol (RDP). Applications installed in Windows XP Mode might take longer to launch because the virtual environment must be initialized. Once launched, however, they cohabit agreeably with your Windows 7 programs. (See Figure 5-7.)

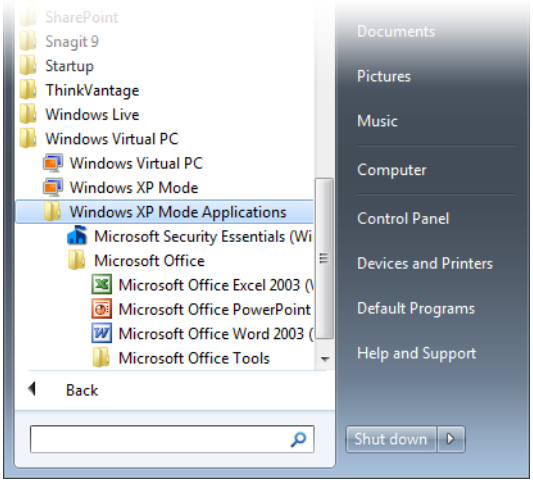


Figure 5-6 Applications installed in Windows XP Mode are published to Windows 7 and can be launched from the Windows 7 Start menu.

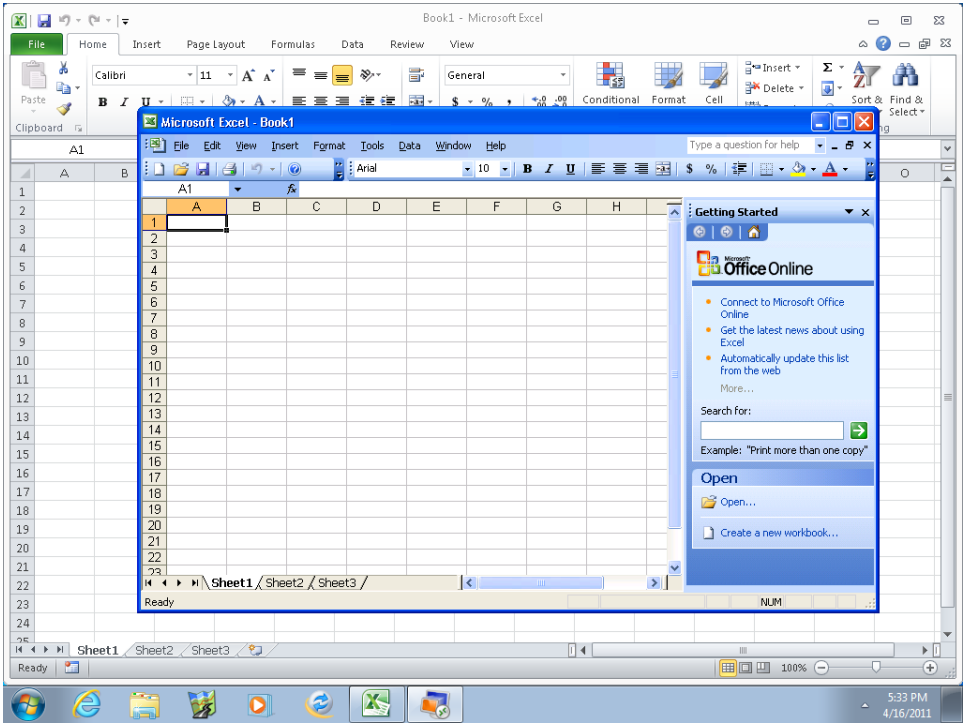
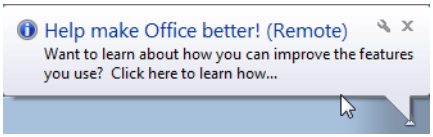


Figure 5-7 Microsoft Office Excel 2003, installed in Windows XP Mode and launched from the Windows 7 Start menu, can share the Windows 7 desktop with Excel 2010, as shown here.

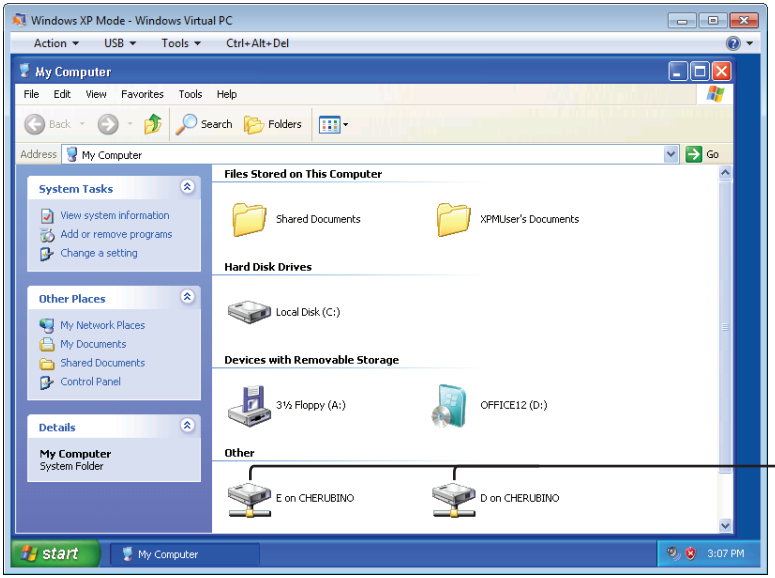
Messages generated by an application running seamlessly also appear on the Windows 7 desktop, identified by the word Remote:



Sharing Data with Windows 7

Whether running seamlessly or housed within a Windows XP Mode frame, applications running in the virtual Windows XP environment share the Clipboard with Windows 7. You can't drag and drop between the two environments, but you can use ordinary cut and paste procedures to transfer data.

Windows Virtual PC, by default, creates a single virtual hard disk, which appears in the Windows XP My Computer folder as drive C. Your host computer's own disk resources are identified and are accessible in My Computer as drive *d* on *computername*:



Hard disk drives on host computer

Sharing Devices with Windows 7

Provided that the Virtual Windows PC integration features are enabled (as they are by default), storage devices, including flash drives and other external media, are automatically shared between the virtual environment and Windows 7. Other kinds of USB 2 devices can

be used in both environments, but you have to attach them in Windows XP Mode to use them there and then release them to make them available to Windows 7.

To use an unshared USB device in Windows XP Mode, follow these steps:

1. Attach and turn on the device.
2. On the Windows Virtual PC USB menu, choose Attach *devicename*. Windows XP will install a driver if one hasn't already been installed.
3. Use the device.

To release the device, making it available to Windows 7, open the USB menu again and choose Release *devicename*. When a Windows XP Mode program is running in seamless mode, you'll find the Manage USB Devices option on the Jump List for the program button on the taskbar.

Configuring Windows Virtual PC

Figure 5-5, earlier in this section, illustrated the Windows Virtual PC Settings dialog box, in connection with Close options. Most of the settings in this dialog box, when the dialog box is accessed from within Windows XP Mode, are read-only. To configure other settings, including integration features, close the virtual environment. Then open the Windows 7 Start menu and click All Programs, Windows Virtual PC, Virtual Machines. In the Windows Explorer window that appears, right-click Windows XP Mode and choose Settings.

Installing Programs on 64-Bit Editions of Windows

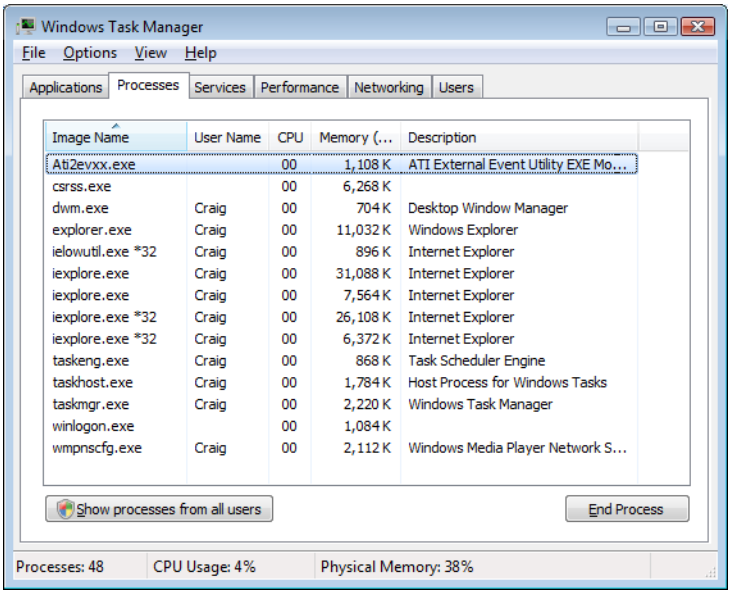
If you're running an x64 edition of Windows, you'll notice the following differences when it comes to program installation:

- 16-bit Windows applications will not install.
- 64-bit programs will be installed, by default, in subfolders of the Program Files folder (%ProgramFiles%), but 32-bit programs will land in subfolders of a separate folder, called Program Files (x86).
- Although most programs designed for a 32-bit environment will run with full functionality in the x64 version of Windows, some might not.

In its x64 editions, Windows 7 provides both 32-bit and 64-bit versions of some programs, including Internet Explorer. The 32-bit version runs by default; to run the 64-bit version, click Start, All Programs, Internet Explorer (64-Bit). Why include both? In an ideal world, you'd use the native 64-bit version to take advantage of its better resource handling and

speed. However, many popular add-ins for Internet Explorer are available only in 32-bit form; to use them, you must run the 32-bit version of Internet Explorer.

In general, it's not essential to know whether a program you're running is a 32-bit or 64-bit program. You can easily find out, however, by opening Windows Task Manager. (Press Ctrl+Shift+Esc.) On the Processes tab, 32-bit processes are identified with "*32" next to the process name:



INSIDE OUT

Use a virtual machine to run 32-bit applications

Although most 32-bit applications work fine in x64 editions of Windows 7, some do not. Hardware-dependent programs—such as the software that comes with a scanner or the control panel for a graphics card—are likely to be among the recalcitrant ones. (You'll also need a 64-bit device driver to use these devices; for more information, see "A Crash Course in Device Drivers" on page 1076.) If you have a hardware device and accompanying software that won't work in your 64-bit Windows edition, one workaround is to install virtual machine software (such as Windows Virtual PC or VMware Workstation) and set up a 32-bit (x86) Windows edition in a virtual machine. (You'll need a separate license for each copy of Windows.) Then install the hardware and its software in the virtual machine. This way, you can enjoy the benefits of 64-bit computing while continuing to use legacy products until their developer provides 64-bit support or you replace the product.

Managing Startup Programs

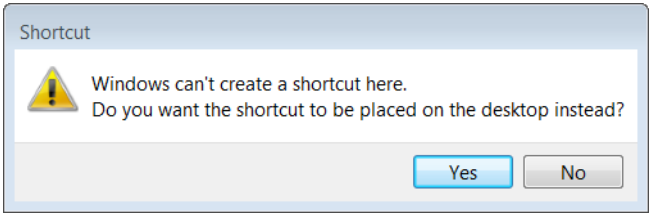
Setting up a program to run automatically when you start Windows is easy. If the program's installer doesn't offer to do this for you (many do) and you want the program to run every time you begin a Windows session, create a shortcut for the program in the Startup folder of your Start menu. Here's one good way to do it:

1. Open the Start menu, choose All Programs, right-click Startup, and then choose either Open (to create a shortcut for your user account only) or Open All Users (to create a shortcut for all accounts at your computer). This will open the appropriate Startup folder in Windows Explorer.
2. On the Start menu, find the item that you want to launch automatically when you start Windows.
3. Drag the item to the Startup folder.

TROUBLESHOOTING

You can't create a shortcut in the Startup folder

If you see a message like this:



you're in the All Users Startup folder (%ProgramData%\Microsoft\Windows\Start Menu\Programs\Startup) instead of your own Startup folder (%AppData%\Microsoft\Windows\Start Menu\Programs\Startup). The All Users folder holds shortcuts for everyone with an account at your computer. Program installers (running under the TrustedInstaller account) can create shortcuts there, but you cannot unless you provide administrative credentials. To do that, go ahead and create a shortcut on your desktop, and then drag the shortcut to the All Users Startup folder in Windows Explorer. A Destination Folder Access Denied message appears; click Continue, and then, if prompted, enter the name and password of an administrator account to complete the process.

To get to your own Startup folder, be sure that you choose Open, not Open All Users, when you right-click the Startup folder shortcut on the Start menu.

Controlling Startup Programs with the System Configuration Utility

The problem that many users have with startup programs is not with creating them (that's easy, and in many cases it happens more or less automatically), but getting rid of them. Having too many startup programs not only makes your system take a longer time to start, it also has the potential to waste memory. If you don't require a program at startup, it's a good idea to get it out of your startup path.

Unfortunately, tracking down programs that start automatically isn't as easy as you might think. A program can be configured to run at startup in many ways, not just by having a shortcut in a Startup folder. To wit:

- **Run key (machine)** Programs listed in the registry's HKLM\Software\Microsoft\Windows\CurrentVersion\Run key are available at startup to all users.
- **Run key (user)** Programs listed in the HKCU\Software\Microsoft\Windows\CurrentVersion\Run key run when the current user logs on. A similar subkey, HKCU\Software\Microsoft\Windows NT\CurrentVersion\Windows\Run, can also be used.
- **Load value** Programs listed in the Load value of the registry key HKCU\Software\Microsoft\Windows NT\CurrentVersion\Windows run when any user logs on.
- **Scheduled tasks** The Windows Task Scheduler (see "Using Task Scheduler" on page 966) can specify tasks that run at startup. In addition, an administrator can set up tasks for your computer to run at startup that are not available for you to change or delete.
- **Win.ini** Programs written for 16-bit Windows versions can add commands to the Load= and Run= lines in the [Windows] section of this startup file, which is located in %SystemRoot%. The Win.ini file is a legacy of the Windows 3.1 era.
- **RunOnce and RunOnceEx keys** This group of registry keys identifies programs that run only once, at startup. These keys can be assigned to a specific user account or to the machine:
    - HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnce
    - HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnceEx
    - HKCU\Software\Microsoft\Windows\CurrentVersion\RunOnce
    - HKCU\Software\Microsoft\Windows\CurrentVersion\RunOnceEx

- **RunServices and RunServicesOnce keys** As the names suggest, these rarely used keys can control automatic startup of services. They can be assigned to a specific user account or to a computer.

- **Winlogon key** The Winlogon key controls actions that occur when you log on to a computer running Windows 7. Most of these actions are under the control of the operating system, but you can also add custom actions here. The HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\Userinit and HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\Shell subkeys can automatically launch programs.

- **Group Policy** The Group Policy console includes two policies (one in Computer Configuration\Administrative Templates\System\Logon, and one in the comparable User Configuration folder) called Run These Programs At User Logon that specify a list of programs to be run whenever any user logs on.

- **Policies\Explorer\Run keys** Using policy settings to specify startup programs, as described in the previous paragraph, creates corresponding values in either of two registry keys: HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\Run or HKCU\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\Run.

- **BootExecute value** By default, the multistring BootExecute value of the registry key HKLM\System\CurrentControlSet\Control\Session Manager is set to *autocheck autochk* *. This value causes Windows, at startup, to check the file-system integrity of your hard disks if your system has been shut down abnormally. It is possible for other programs or processes to add themselves to this registry value. (Note: Microsoft warns against deleting the default BootExecute value. For information about what to do if your system hangs while Autocheck is running, see Microsoft Knowledge Base article 151376, "How to Disable Autochk If It Stops Responding During Reboot," at *w7io.com/0503*.)

- **Shell service objects** Windows loads a number of helper dynamic-link libraries (DLLs) to add capabilities to the Windows shell.

- **Logon scripts** Logon scripts, which run automatically at startup, can open other programs. Logon scripts are specified in Group Policy in Computer Configuration\Windows Settings\Scripts (Startup/Shutdown) and User Configuration\Windows Settings\Scripts (Logon/Logoff).

In Windows Vista, Windows Defender, the antispyware utility included with the operating system, offered a list of your startup programs as part of its Software Explorer. That feature of Windows Defender has been removed. However, the System Configuration utility, still included with Windows 7, can help you see what's running at startup and disable

particular startup items if you choose to. Figure 5-8 shows the Startup tab of the System Configuration utility.

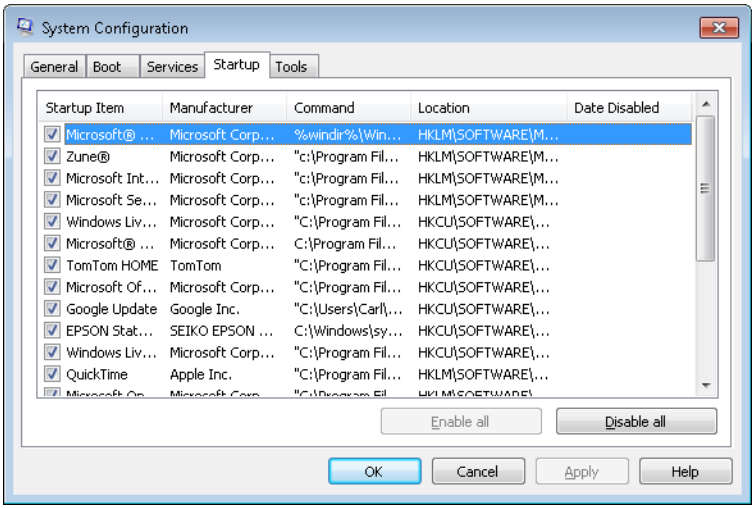


Figure 5-8 To disable a startup item in System Configuration, clear its check box.

To run System Configuration, type **msconfig** in the Start menu's search box, and then press Enter. Click the Startup tab to see what your system is busy doing at startup, and clear the check boxes for any items you want to disable. After you disable one or more items, those items will appear at the bottom of the list (in the default sort order) the next time you run System Configuration, and the date and time of their disabling will appear in the column at the right.

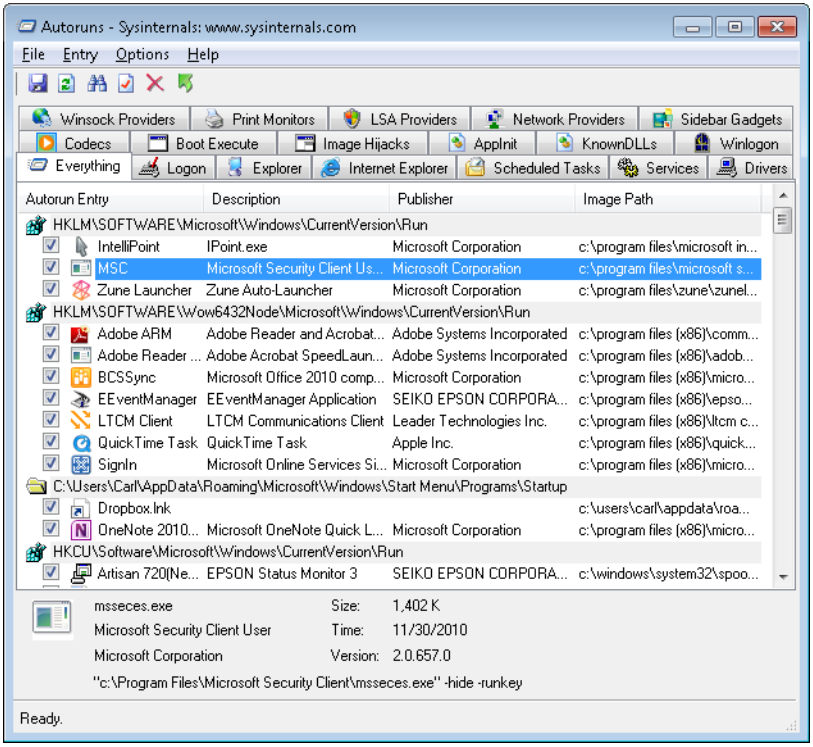
System Configuration is dandy for temporarily lightening your system's startup overhead, and for those who don't relish registry edits, it's a fine way to disable startup behavior established by registry keys. Note, however, that the utility's startup list does not include items established via Group Policy or the Windows 7 Task Scheduler, nor in many of the other dark recesses in which startup programs can hide.

For an alternative, less cramped, and more readable listing of your system's startup programs, open the Start menu, choose All Programs, Accessories, and then System Tools, and run System Information. In the left pane of the System Information window, open Software Environment, and then click Startup Programs. Because the System Information window can be maximized, it's handier for reading long registry paths than is the fixed-size System Configuration window. Like System Configuration, however, it omits policy and scheduled startup tasks.

Using Autoruns

For the most comprehensive listing of items that run at startup, as well as a handy tool to prevent certain programs from starting, we recommend Autoruns, a free utility from Windows Sysinternals. Autoruns, which you can download from *w7io.com/2001*, shows all the registry keys and startup locations listed earlier, and it also shows Explorer shell extensions, services, desktop gadgets, browser helper objects, and more. Autoruns is particularly useful for finding processes that don't belong (such as a Trojan horse or other malware) or that you suspect of causing problems. You can then disable these items without removing them while you test your theory, or you can delete their auto-start command altogether.

Select an item, and its details appear at the bottom of the screen, as shown here. Disable an item by clearing the check box next to its name; you can later reenable it by selecting the check box. To clear an item from the auto-start list, select it and choose Entry, Delete. (Note that deleting removes only the entry in the registry or other location that causes the item to run; it does not delete the program.)



Although the tabs at the top of the Autoruns window filter the list of auto-start items into various categories, the number of items can still be daunting. One nice feature of Autoruns

is its ability to filter out components that are part of Windows or are digitally signed by Microsoft, as these are presumably safe to run. Commands on the Options menu control the appearance of these items.

You can also use the Compare feature in Autoruns to compare before and after snapshots of the data the program finds. Run Autoruns before you install a new program, save the data, run Autoruns again after you install the program, and compare the results to see what changes to auto-start behavior were made by the program installation.

Managing Running Programs and Processes with Windows Task Manager

Windows Task Manager is a tool that serves two essential purposes. You can use it to track aspects of your system's performance, and you can use it to see what programs and processes are running and terminate items when the normal shutdown methods aren't working.

For information about using Task Manager to monitor system performance, see "Monitoring Performance in Real Time" on page 841.

The easiest way to run Task Manager is by means of its keyboard shortcut, Ctrl+Shift+Esc. Figure 5-9 shows the Applications tab and Processes tab of Task Manager.

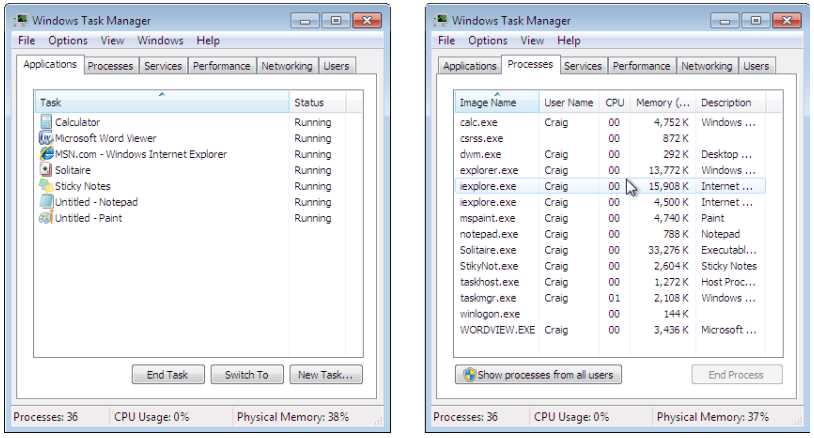


Figure 5-9 Task Manager is useful for terminating recalcitrant applications and processes, as well as for monitoring system performance.

In Task Manager, the Applications tab lists all running programs that have corresponding taskbar buttons. Each entry in the Task column consists of descriptive text identical to the text displayed in the program's title bar.

The Applications tab also includes a Status column. Most of the time, the entries in this list will read *Running*. If an application hangs or freezes for any reason, you will see the words *Not Responding* in this column instead. In that case, you can attempt to shut down the misbehaving program by selecting its entry and clicking End Task. Don't be too quick on the trigger, however; Not Responding doesn't necessarily mean that an application is irredeemably lost. If the program is using every bit of resources to handle a different task, it might simply be too busy to communicate with Task Manager. Before you decide to end the program, give it a chance to finish whatever it's doing. How long should you wait? That depends on the task. If the operation involves a large data file (performing a global search and replace in a large Microsoft Access database, for instance), it's appropriate to wait several minutes, especially if you can hear the hard disk chattering or see the disk activity light flickering. But if the task in question normally completes in a few seconds, you needn't wait more than a minute.

The items listed on the Applications tab represent only a portion of the total number of programs and services running on a Windows computer at any given time. To see the entire list of running processes and gain access to a broader selection of tools for managing them, click the Processes tab.

Note

To find out what process is associated with a given application, right-click the application on the Applications tab and choose Go To Process from the shortcut menu.

INSIDE OUT **Be smart about shutdowns**

When you shut down an application by clicking the End Task button on the Applications tab, the effect is the same as if you had chosen to shut down the program using its menus or by right-clicking its taskbar button and choosing Close. If the program can respond to the shutdown request, it should prompt you for confirmation or give you a chance to save open files, if necessary. By contrast, the End Process button on the Processes tab zaps a process immediately and irrevocably, closing any open files without giving you a chance to save them. Whenever possible, you should try the End Task option first and reserve the drastic End Process option for situations in which you have no alternative.

Initially, the Processes tab lists programs and services that are directly accessible to the current user. To see everything, including processes running under system accounts and the

accounts of other logged-on users (if you use Fast User Switching), click Show Processes From All Users.

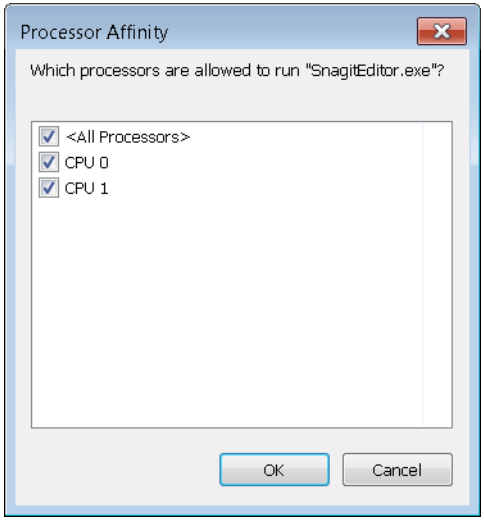
For each process, Task Manager includes the following information by default: Image Name (the name of the process), User Name (which user started the process), CPU (the percentage of the CPU's capacity that the process is currently using), Memory (Private Working Set) (the amount of memory the process requires to perform its regular functions), and Description (a text field identifying the process). To display additional information for each process, open the View menu and choose Select Columns.

If you need to shut down a process, select it and click End Process.

INSIDE OUT

Assign a program to a specific processor

If you have a dual-core or multiprocessor system, you can assign a process to a specific processor—but only after the process is already running. To do this, right-click the process on the Processes tab and choose Set Affinity. In the dialog box that appears (shown here), select the processor you want to use. (If all CPUs are selected, Windows sets the process affinity as it sees fit.)



If an "access denied" message appears when you try to set processor affinity, return to the Processes tab, select Show Processes From All Users, and provide your administrator credentials at the UAC prompt. Task Manager then runs as an elevated process, enabling you to set affinity for any process.

Running a Program as an Administrator or Another User

As mentioned earlier in this chapter, you can run a program as an administrator by right-clicking any shortcut for the program (in the Start menu or elsewhere), choosing Run As Administrator, and satisfying the UAC prompt with either consent or credentials. Here are two additional ways to do it:

- Start a Command Prompt session as Administrator (by right-clicking a shortcut for Cmd.exe and choosing Run As Administrator). Then, in the Command Prompt window, type the name of the executable file for whatever program you want to run as an administrator. To run Registry Editor, for example, type **regedit**. Because you've already passed UAC inspection for the Command Prompt session, and because whatever you run from Command Prompt is a child process of Command Prompt, you don't have to deal with any further UAC prompts. This method is excellent for situations where you need to run a sequence of programs as an administrator. Keep one administrative-level Command Prompt window open, and run your programs from the command line.

- Type the name of the program you want to run in the Start menu search box, and then press Ctrl+Shift+Enter.

To run a program under a different user account, you can right-click the program shortcut and choose Run As Different User from the shortcut menu. You will be prompted to enter the password for the specified user account. Alternatively, you can use the runas command from the Command Prompt window or a shortcut. The syntax is

```
runas /user:username programname
```

After you issue the command or activate the shortcut, you'll be prompted to enter the password for the specified user account. For security reasons, you cannot save the password with the shortcut. Note that the Runas command does not work with Windows Explorer or with Microsoft Management Console (MMC) snap-ins.

INSIDE OUT

Add Runas to shortcut menus

Although Runas doesn't appear on the shortcut menu for programs in Windows 7, you can restore this capability by running ShellRunas, a program you can download from Windows Sysinternals at *w7io.com/20504*.

Uninstalling Programs

To remove an installed Windows program, open Control Panel and click Uninstall A Program. (You'll find that under the Programs heading.) The list of programs you can uninstall does not include usage information, but it does list the size of each program. Click the program you want to remove, or select it and click Uninstall/Change.

Here are some basic facts you should know about uninstalling programs:

- Windows 7 warns you if you attempt to remove a program while other users are logged on. For safety's sake, you should always completely log off any other user accounts before attempting to remove a program.
- Many uninstall programs leave a few traces of the programs behind, either inadvertently or by design. For instance, programs that create data files typically do not remove custom user settings and data files as part of the uninstall process.
- You can remove programs using Control Panel only if they were originally installed with a Windows-compatible setup program. Some older programs and simple utilities work by copying their files to a folder. In this case, you uninstall the program by manually removing its files and shortcuts.
- In some cases, a poorly written uninstall routine might leave a phantom entry behind in the list of installed programs, even after it has successfully removed all traces of the program itself. When you click such an entry in Control Panel, Windows offers to remove the orphaned entry from the list. If that doesn't work for some reason, you can remove entries manually by using Registry Editor. Detailed instructions are available in Knowledge Base article 314481, "How to Manually Remove Programs from the Add or Remove Programs Tool" (*w7io.com/0504*). Although written for Windows XP, the procedure also applies to Windows 7.

Setting Default Programs, File-Type Associations, and AutoPlay Options

Most of the programs you use in Windows are associated with particular file types and protocols. These associations are what enable you, for example, to double-click a Windows Media Audio (.wma) file in Windows Explorer and have your favorite audio program play the file, or click an Internet hyperlink in a document or e-mail message and have your favorite web browser take you to the appropriate website. The Windows setup program establishes many of these associations for you when the operating system is installed. The setup programs for various applications also create associations with the file types those programs can use. (Sometimes such programs, when installed, change existing file-type associations; generally, but not invariably, they ask for your permission before doing this.)

But regardless of how the associations between programs and file types and protocols are currently set, Windows makes it easy for you to see and modify the settings. You can inspect and alter current defaults by clicking Default Programs, on the right side of the Start menu, or opening Control Panel, clicking Programs, and then clicking Default Programs. Either way, you arrive at the section of Control Panel shown in Figure 5-10.

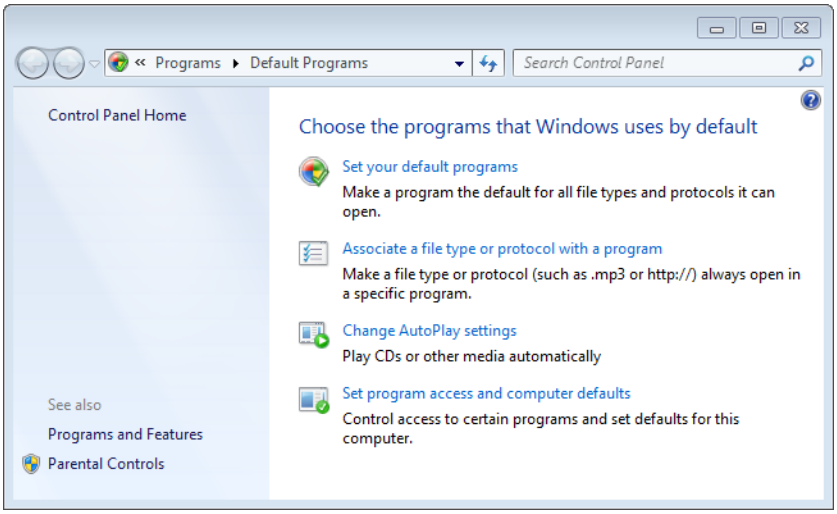


Figure 5-10 The designers of Windows 7 considered this aspect of Control Panel to be so important that they gave it its own Start menu entry.

Setting Default Programs

The first item on this menu, Set Your Default Programs, approaches the issue of associations from the standpoint of particular vital applications. You undoubtedly have a good many other applications in addition to these (and you might not have all of these), but the programs listed here are all capable of handling multiple file types and protocols. This list gives you a way to assign programs to *all* the items they can handle—should you choose to do that. (You can also assign programs to a subset of their possible associations.)

To illustrate how this works, we'll select Windows Live Mail in the dialog box shown in Figure 5-11.

As Figure 5-12 shows, the dialog box responds by indicating that Windows Live Mail currently is the default program for one of the file types or protocols it is capable of handling.

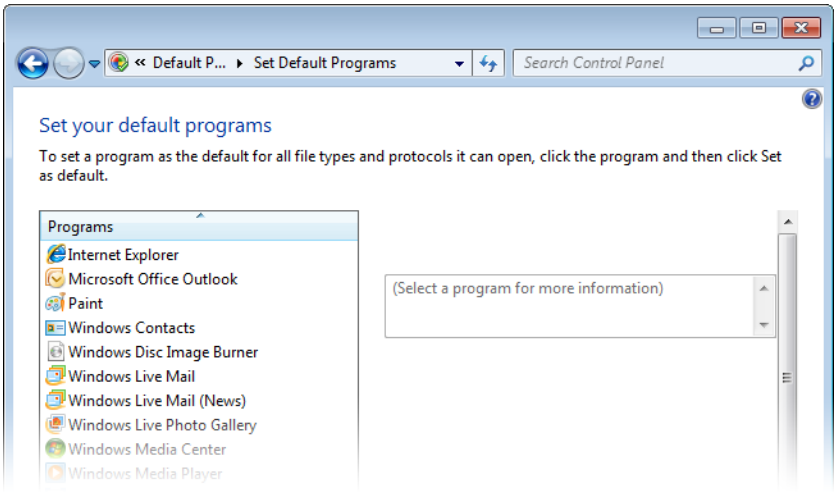


Figure 5-11 The Set Your Default Programs dialog box lets you approach associations from the standpoint of certain vital applications—such as your web browser(s) and e-mail client(s).

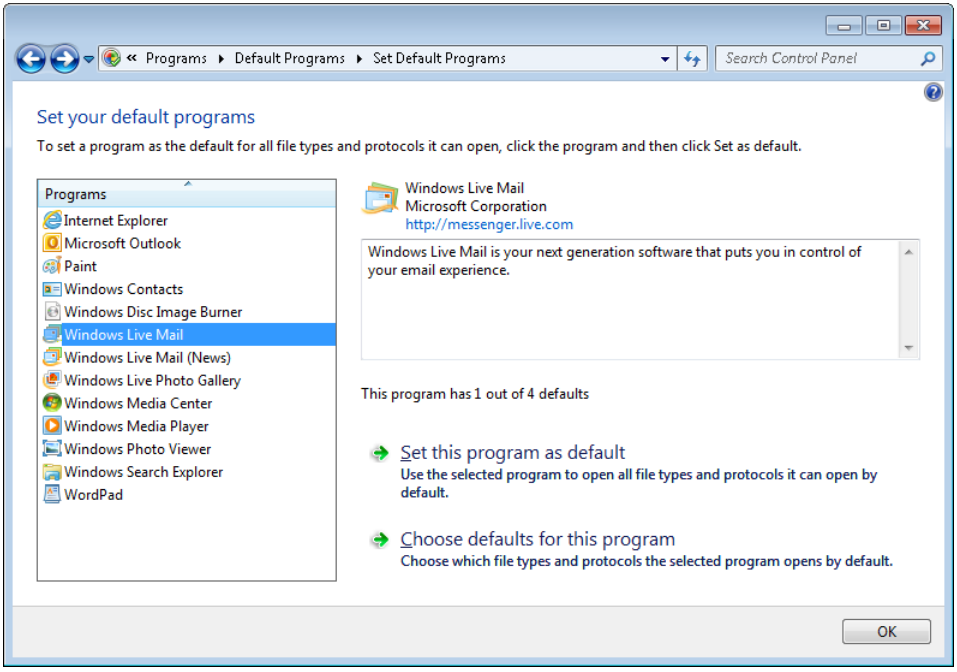


Figure 5-12 In this example, Windows Live Mail is set as the default handler for one of the four protocols it is capable of handling.

To see which defaults Windows Live Mail currently "owns" (and modify particular ones if you want), click Choose Defaults For This Program. The dialog box then lists file extensions and protocols that are possibilities for Windows Live Mail. (See Figure 5-13.)

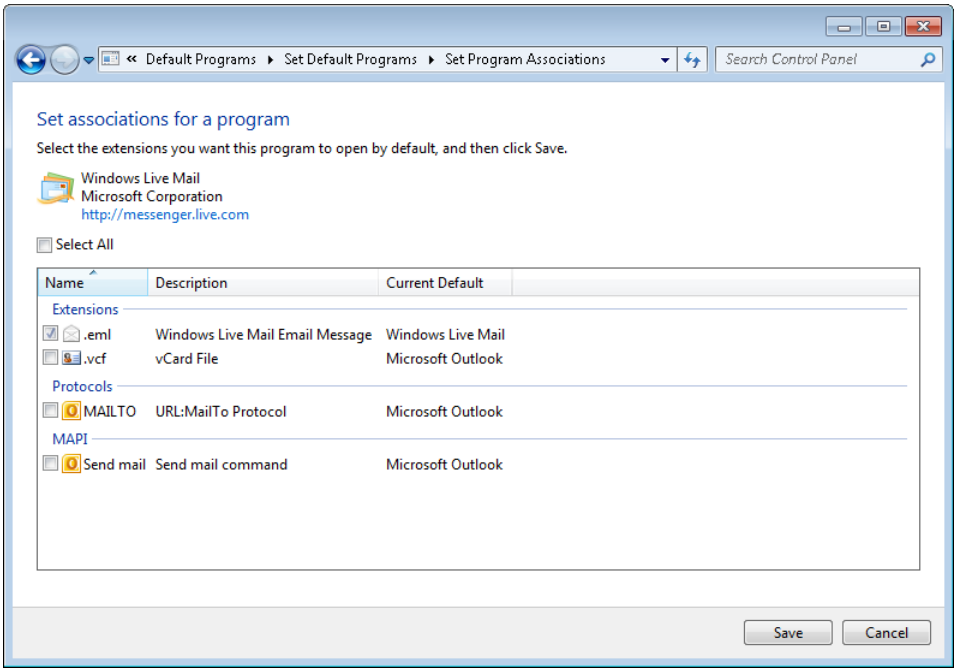


Figure 5-13 Windows Live Mail "owns" the .eml extension; the rest of the file types and protocols that Windows Live Mail is capable of handling belong to Microsoft Outlook.

If you want to make Windows Live Mail the default program for other extensions or protocols, you could select the check boxes associated with these protocols and then click Save. To make Windows Live Mail the default for everything, select the Select All check box and click Save. Alternatively, return to the dialog box shown in Figure 5-12 and click Set This Program As Default.

Changing File-Type Associations

The second item on the menu shown in Figure 5-10 approaches the matter of file-to-program associations from the perspective of the file type. Figure 5-14 shows a list of file types comparable to what you would see if you clicked this menu item.

The file-type list is alphabetized by extension. For each extension, the list shows a description of the file and the program that is currently set as the default application for that file type. So, for example, in Figure 5-14, you can see that the extension .bmp represents

bitmap image files, and that Windows Photo Viewer is the program currently associated with such files. In other words, double-clicking a .bmp file in Windows Explorer, as things now stand, will open that file in Windows Photo Viewer.

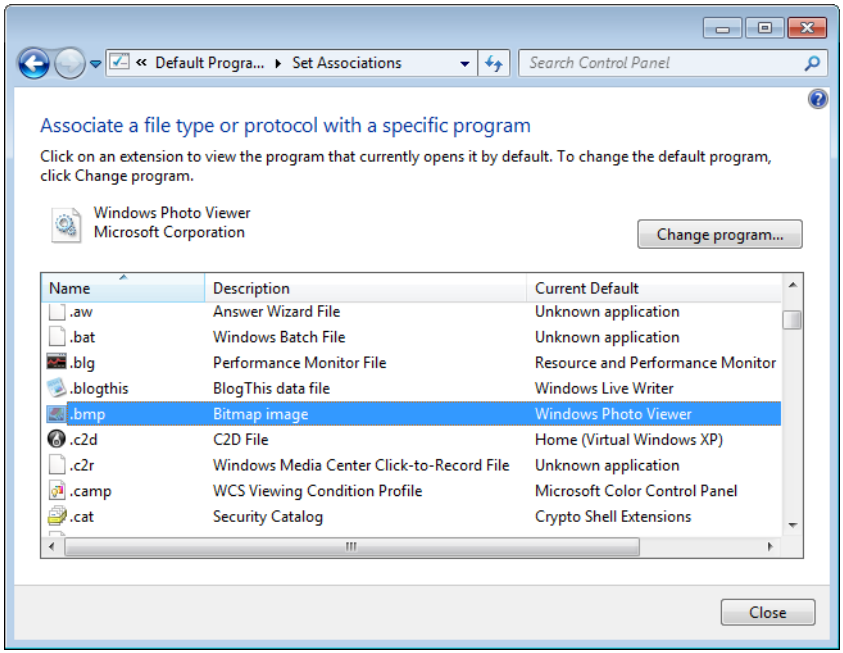


Figure 5-14 The list of file extensions shown in this dialog box lets you change the program or programs associated with individual file types.

To change the default, click Change Program. As Figure 5-15 shows, the Open With dialog box that appears has a section called Recommended Programs and a section called Other Programs. The Recommended Programs section includes the current default (Windows Photo Viewer) and other programs that are registered as being capable of opening files of the current type (bitmap images, in this case). The dialog box also includes an Always Use The Selected Program To Open This Kind Of File check box, which appears dimmed and is unavailable. The reason the check box is unavailable is that Windows assumes that because you have arrived in the Open With dialog box by way of the Default Programs command (on the Start menu or in Control Panel), the only business you have here is to change the program that's always used to open the selected file type. (As you'll see in a moment, there's another way to get to this dialog box.)

The Other Programs section of this dialog box will at first appear unpopulated. To make its contents visible, click the little arrow at the end of the dividing line between the Recommended Programs section and the Other Programs section. (We've already done that in Figure 5-15.)

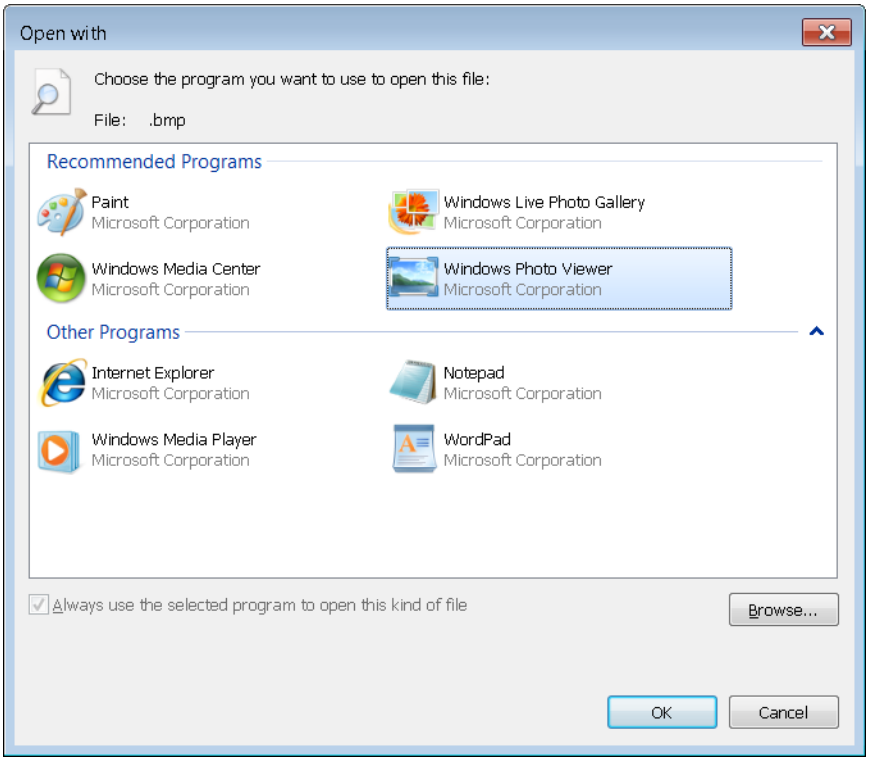


Figure 5-15 To change the default program for a file type, make your selection in the Recommended Programs section of this dialog box, and then click OK.

Be careful. The programs listed in Other Programs are simply commonplace applications installed on your system. They are almost guaranteed to be bad choices for the selected file type. If you select one of these and click OK, it will become the default program for the current file type, no matter how unsuitable it might be. You can fix that easily enough by returning to the Open With dialog box. But the spurned program will make a nuisance of itself by remaining in the Recommended Programs section. If, for example, you're curious about how a bitmap image might look when rendered by Notepad, you might be tempted to make Notepad, temporarily, the default application for that file type. If you do this, Notepad will become one of the recommended programs for opening bitmap files—even though you'll probably never want to use it again for that purpose. (See Figure 5-16.)

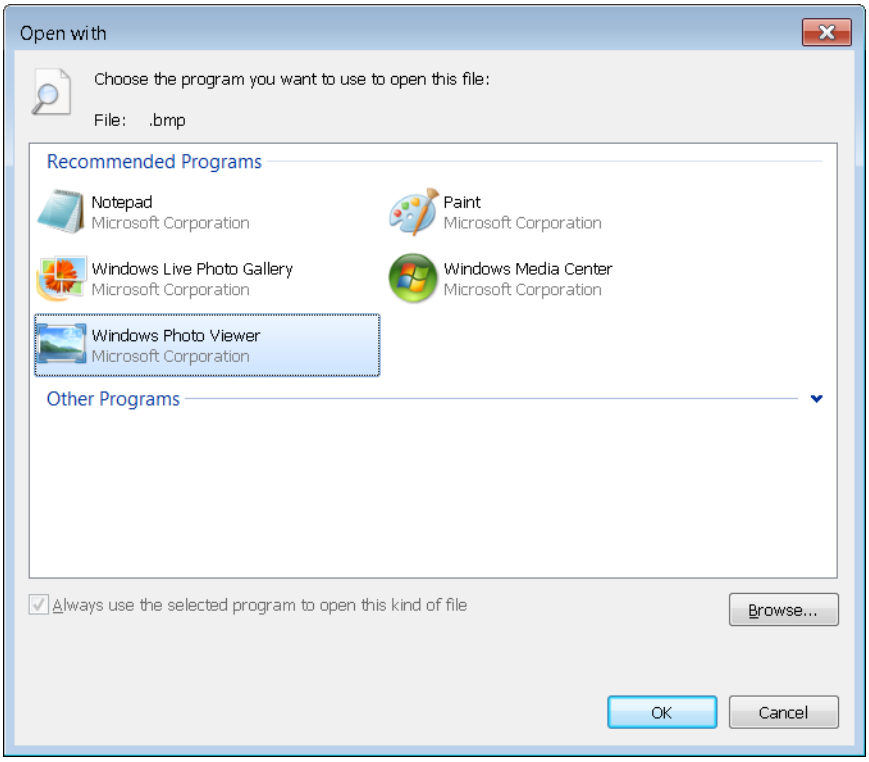


Figure 5-16 If you make a program the default application for a file type and then change your mind, that program will remain in the Recommended Programs section of the dialog box.

TROUBLESHOOTING

You want to remove a program from the Recommended Programs section of the Open With dialog box

The contents of the Recommended Programs list are determined in part by the registry key HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\FileExts*filetype*\OpenWithList (where *filetype* is the extension of the file type in question). So, for example, in the case shown in Figure 5-16, the ...\.bmp\OpenWithList key includes several values, one of which is Notepad.exe. Deleting the unwanted item in the OpenWithList key removes it from the Recommended Programs list. (Some items in the Recommended Programs and Open With lists appear as the result of values within the HCR*filetype* key and its subkeys. However, accidental additions to the lists, as described in the preceding section, are always made in the HKCU hive.)

Changing the Default Application from Windows Explorer

If you right-click a file in Windows Explorer and choose Open With from the shortcut menu, the programs that appear in the submenu are those that appear in the file type's Recommended Programs list, as shown in Figure 5-15. In Figure 5-17, for example, we've right-clicked a .bmp file in Windows Explorer and chosen Open With, and we're presented with Paint, Windows Live Photo Gallery, Windows Media Center, and Windows Photo Viewer—the same four programs that appear in the Recommended Programs section of Figure 5-15.

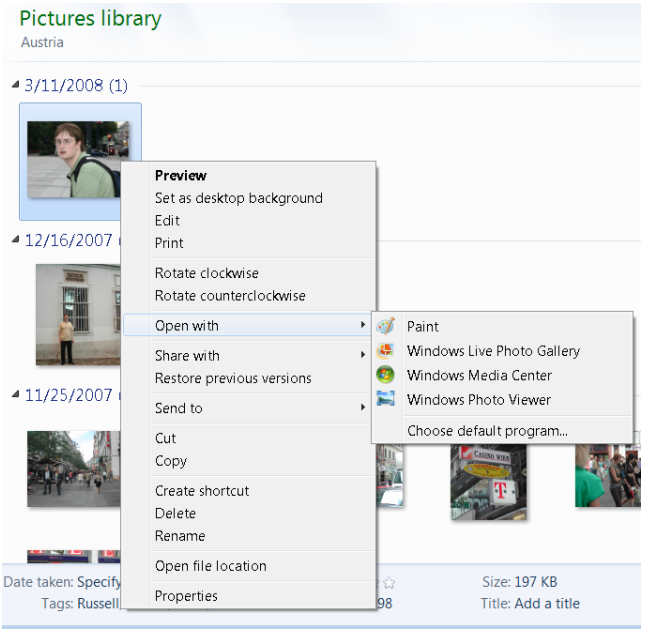


Figure 5-17 The options that appear when you right-click a file in Windows Explorer and choose Open With are those that appear in the file type's Recommended Programs list in Control Panel.

Notice that the programs are listed alphabetically, and the menu does not indicate which one is the current default. The assumption is that if you've gone to the trouble of choosing Open With, it's because you want, this time, to open the file in a nondefault program.

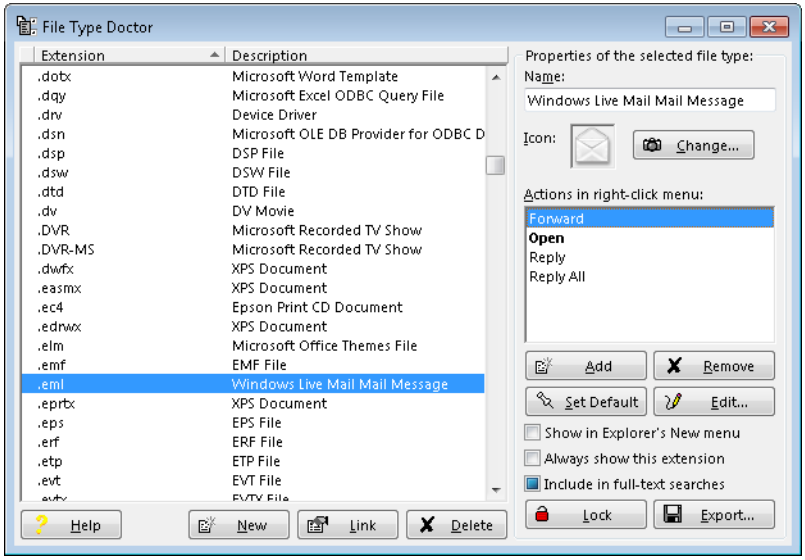
You can use this Open With menu either to open the selected file one time in a nondefault application or to change the default. To do the latter, click Choose Default Program on the menu shown in Figure 5-17. The Open With dialog box that appears will be just like the one shown in Figure 5-15, with one major exception: the Always Use The Selected Program To Open This Kind Of File check box will be available. Note that it will be available *and selected*. If you don't want to make a change to the default (if you're just looking around or curious about what might show up in the Other Programs section of the dialog box), be

sure to clear the check box before you select a program and click OK. (If you do unintentionally reset the default, you can always return to this Open With dialog box and fix the problem.)

INSIDE OUT

Use a third-party tool to manage file-type associations

The built-in tools described in the preceding sections are perfectly adequate for specifying the default program for a particular file type. But if you want to change other attributes of a file type, such as its description or icon and whether it appears as an option when you choose New in Windows Explorer, you'll need to use a third-party utility. One we like is File Type Doctor, which is a component of Creative Element Power Tools (*w7io.com/20503*), shown here. In addition to viewing and modifying these file-type properties, you can use File Type Doctor to easily add context menu items—commands that appear on the menu when you right-click a file of the specified type.



Setting Program Access and Computer Defaults

The dialog box that appears when you choose Default Programs on the Start menu and click Set Program Access And Computer Defaults (shown in Figure 5-18) is designed to give Windows users the option to remove access to a number of Microsoft programs that were tightly integrated into the original version of Windows XP.

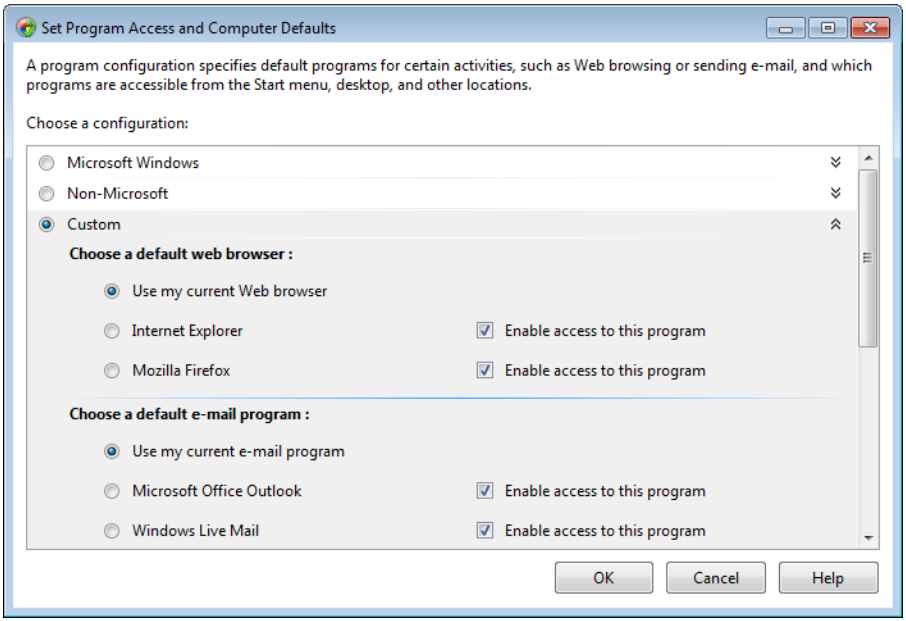


Figure 5-18 You can use this dialog box to remove certain Microsoft programs from menus in Windows.

In the Set Program Access And Computer Defaults dialog box, the default selection on all newly installed systems is Custom. This essentially means that you are willing to make your own decisions about what Microsoft middleware programs are visible and accessible on your system. This works for most users. If you want to remove the evidence of a particular Microsoft item, such as Internet Explorer, clear the Enable Access To This Program check box beside the program's name. Note that this action does not uninstall the program; it merely removes the program from the Start menu, desktop, and other locations. To abjure all Microsoft middleware, select the Non-Microsoft option. If you change your mind and want the Microsoft tools back, return to the dialog box and click Microsoft Windows or Custom.

Turning Windows Features On or Off

If you want to disable certain default Windows features, you can use the Set Program Access And Computer Defaults dialog box just shown. A simpler, more direct, and more versatile way to get the job done is to open Control Panel, choose Programs, and then, under Programs And Features, choose Turn Windows Features On Or Off. As Figure 5-19 shows, you can disable or reenable many different Windows features in the Windows Features dialog box that appears. Some of the entries in this list (those with outline controls beside them) contain subentries. You can disable subentries without lopping off the whole category by opening the outline heading. To banish Spider Solitaire, for example, while leaving the other games in place, open the Games entry and clear the Spider Solitaire check box.

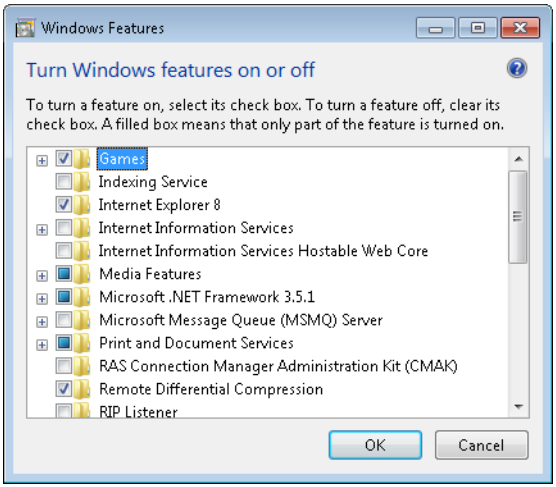


Figure 5-19 The Windows Features dialog box provides a simple way to disable or reenable selected programs.

Note that the Windows Features dialog box lists features that are not enabled by default. The Indexing Service entry, for example, refers to a service that was used in earlier versions of Windows, not the service that builds and maintains the Windows 7 search index. Unless you are sure you need a feature that is not enabled by default, it's better to leave its setting alone.

Setting AutoPlay Options

AutoPlay is the feature that enables Windows to take appropriate action when you insert a CD or DVD into a drive. The operating system detects the kind of disc you have inserted—an audio disc, a program, or a DVD movie, for example—and takes the action that you have requested for that type of media. If you have not already made a decision about what the operating system should do, an AutoPlay dialog box appears when the disc is detected, and Windows presents a list of possible actions (including in some cases an option to do nothing at all). A check box in this dialog box lets you specify that the action you're currently choosing should be the default for all discs of the current type. Figure 5-20 shows an example of the AutoPlay dialog box.

If you have used the AutoPlay dialog box shown in Figure 5-20 to set a default action for a particular media type, and you subsequently change your mind and want a different default, open the Start menu, click Default Programs, and then click Change AutoPlay Settings. The dialog box that appears, shown in Figure 5-21, provides a drop-down list of possible actions for each media type. You can make your selection from this list and then click Save.

Figure 5-20 The AutoPlay dialog box that appears when you first insert an optical disc of a given type lets you tell Windows how to process the disc—either this time or every time.

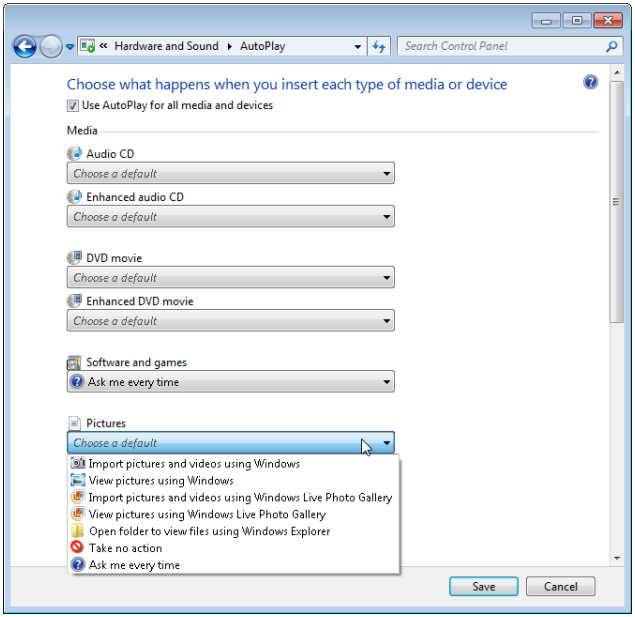


Figure 5-21 For each optical media type, Windows lets you choose from a list of appropriate default possibilities.

INSIDE OUT

You don't want a default action?

To have *no* default action for a given optical media type, choose Ask Me Every Time. To suppress the AutoPlay dialog box completely, choose Take No Action.

INSIDE OUT

AutoRun has been disabled on some USB media

AutoRun is the mechanism that proposes a default action when you insert an optical disc in the drive. In Figure 5-20, for example, the contents of a file called AutoRun on the inserted CD is responsible for suggesting the action *Run index.html*. Because of the rising incidence of malware that uses AutoRun to induce unwary users into running Trojan horses (the Conficker worm, about which you can read at *w7io.com/0505*, is a conspicuous example), the designers of Windows 7 decided to disable AutoRun capability on USB devices other than removable optical media.

Because of this security change, some devices that executed programs automatically when plugged into a Windows Vista computer might appear not to work in Windows 7. If your device seems inert when attached to your Windows 7 system, don't assume it's broken. Open Computer in Windows Explorer, and then open the entry for your device. You will probably find a file there called AutoRun. Opening that file in Notepad will reveal the name of the program that would run automatically had AutoRun not been disabled for your device. Run that program from Windows Explorer.

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