

The PC and Gadget Help Desk

A Do-It-Yourself Guide To
Troubleshooting and Repairing

Mark Edward Soper

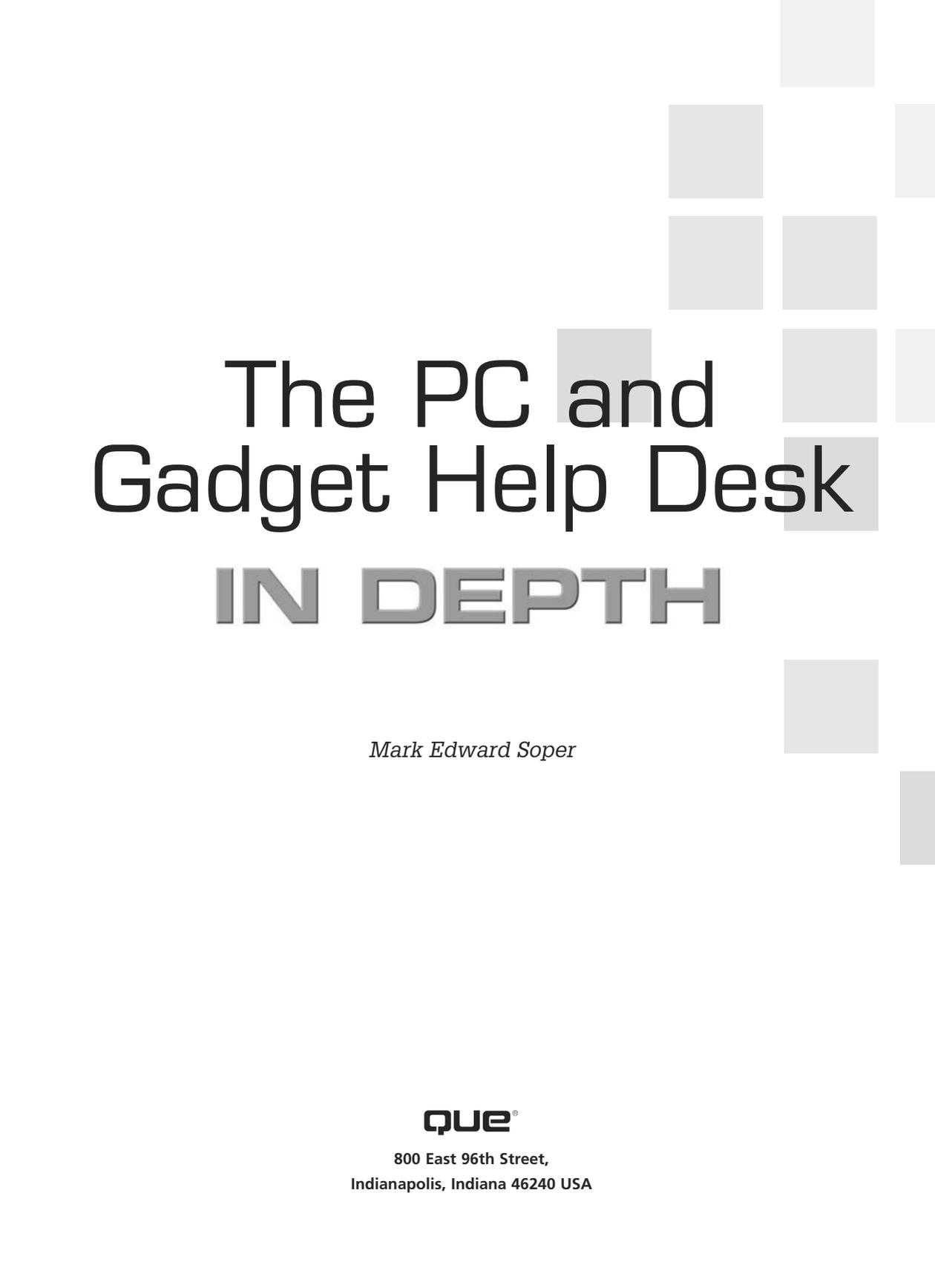


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The PC and Gadget Help Desk

IN DEPTH

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THE PC AND GADGET HELP DESK

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ABOUT THE AUTHOR

Mark Edward Soper has helped users deal with problems with computers, digital cameras, and other personal tech devices for more than 25 years. He is the author of *PC Help Desk in a Book* and co-author of *Leo Laporte's PC Help Desk*, as well as more than two dozen other books on Windows, digital photography, networking, broadband Internet, CompTIA A+ Certification, and computer troubleshooting and upgrading. With this level of experience, Mark is experienced at helping readers understand and use creative solutions to connectivity, configuration issues, data recovery, and other types of problems that can beset users of personal technology. Mark is also the creator of *Building and Repairing PCs* (Que Video), which provides more than two hours of detailed, hands-on help for building, repairing, and upgrading desktop and laptop computers.

Dedication

For Jim K. and Connie E. Thanks to each of you for the opportunities to sell, train, and learn about computers and personal tech "back in the day."

ACKNOWLEDGMENTS

A successful author has many people to thank, so I'd better get started! Whether this is the first one of my books you've tried or you're back for more, thank you so very much for your support, your encouragement, and your suggestions.

Each of us has been entrusted by the Almighty with talents and gifts. I thank Him, the ultimate source of all goodness and wisdom, for the opportunity to share what I have learned and encourage you to learn with me.

My wife Cheryl deserves much of the credit for this book. Not only has she exemplified the love of God in my life, but as a librarian, she saw the urgent need for this book and encouraged me to write it.

Thousands of students across the country, as well as clients here at home, have provided me with case studies and opportunities to put these tips, techniques, and tools to work. My extended family's mixture of Windows PCs and mobile devices of both the iOS and Android families, digital cameras, and home theater systems has also provided plenty of opportunities to learn how everything (sometimes) can work together.

I also want to thank the editorial and design team that Que Publishing put together for this book: Many thanks to Rick Kughen (ably assisted by Todd Brakke) for bringing me back for a third generation of *PC Help Desk*. Thanks also to Greg Wiegand for giving this project the green light, Brandon Cackowski-Schnell for developing the book, Karen Weinstein for checking technical issues, Sandra Schroeder for managing this project, Seth Kerney for supervising the final production stages, Barbara Hacha for making the grammar behave itself, Kristin Watterson for coordinating the project, and Mark Shirar for a great cover and interior design. It's been more than 15 years since I teamed up with Que Publishing, and I look forward to many more years of working together to bring you technical information that teaches, informs, and inspires.

WE WANT TO HEAR FROM YOU!

As the reader of this book, *you* are our most important critic and commentator. We value your opinion and want to know what we're doing right, what we could do better, what areas you'd like to see us publish in, and any other words of wisdom you're willing to pass our way.

We welcome your comments. You can email or write to let us know what you did or didn't like about this book—as well as what we can do to make our books better.

Please note that we cannot help you with technical problems related to the topic of this book.

When you write, please be sure to include this book's title and author as well as your name and email address. We will carefully review your comments and share them with the author and editors who worked on the book.

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Introduction

Why You Need This Book

If you're a typical electronics user, you have a PC (maybe more than one), a smartphone, a tablet or two, and a printer. You probably also have a home theater system with an HDTV, a sound bar or receiver, and a Blu-ray player. Add a digital camera or HD camcorder, and you have a home full of devices that are supposed to work nicely with each other—if you're an expert.

If you said to yourself, “Hey, I'm no expert,” that's OK. This book is the expert you've been looking for. I've spent years using, writing about, and learning about these technologies, and I'm here to help.

If you've ever been frustrated by long hold times for “help” that didn't help much, unnecessary service calls, or problems you just can't fix, this book is for you. It isn't written for technology geniuses, but for people who just want their home and personal technology tools to do the jobs they're supposed to—and a little bit more.

This is my third *PC Help Desk* book, and I'm very glad to be covering this topic again. When I wrote my first *PC Help Desk* book and teamed up with Leo Laporte for a sequel about a decade ago, the emphasis was on computers (mainly desktops).

Things have changed a lot since then: a lot more users have laptops than desktops; Windows, Apple, and Android are fighting over the mobile device space; getting devices to play nicely with each other across operating systems and device types is essential; digital cameras, HD camcorders, and action camcorders are part of the action; and home theater systems dominate living rooms and dens in many parts of the world. This book is written for this diverse, exciting, and frustrating world.

We want to help you get your devices working properly, help you solve problems when they occur, and show you how to get your devices to work together and play together.

Technology problems can be divided into three categories:

- Hardware problems
- Software problems
- Internet/networking problems

Sometimes, a technology problem involves two or more of these areas, making the solution even tougher. Fortunately, *The PC and Gadget Help Desk* is designed to solve the most common problems you'll encounter in all three areas, even if multiple problems are plaguing your system.

This book is designed to give you the answers you need to your computer problems—fast! Our goal is to take you directly from symptoms to solutions.

You can count on the solutions in this book. This book is the product of countless hours discovering problems with home and personal electronics (sometimes even creating problems on purpose), discovering solutions, and testing solutions to those problems. In this process, I've used some of the latest products on the market, but I never forget that we're all living on budgets and need help with devices that might not be the newest but still need to work.

I know what it's like to have problems finding answers to technology questions. I've spent more than 25 years as a teacher, trainer, consultant, writer, and filmmaker on technology topics to answer those questions. Read this book and you get the benefits of that experience. This book is based on facts, not fantasy, so you can rely on it.

How to Use This Book

When you have a technology question or problem, you don't need to stuff your brain with huge numbers of facts that you must sift through to find the answers. *The PC and Gadget Help Desk* is designed to provide you with fast access to practical solutions you can apply right away. I hope you'll find it fascinating reading, but it's really designed as a quick reference you'll turn to when your computer has a problem, and one you can put aside until you have another problem or another question.

Some troubleshooting books tell you *what* to do without telling you *why*. Again, *The PC and Gadget Help Desk* is different. I love to explain why things are the way they are inside your computer, commiserate with you when things don't make sense, and show you solutions that make sense. You deserve an explanation of technology problems and their solutions, and we make sure you get what you deserve.

Some books are designed to be read just once; again, *The PC and Gadget Help Desk* is different. Because of its broad and deep coverage of technology problems and solutions, you'll turn to it as a valuable reference again and again to solve problems at home, at the office, or at the corporate help desk.

Here's how to get the most from this book:

1. Take a look at the chapters: they're discussed in detail later in this introduction. Go to the chapter that most closely matches your general problem area. For example, if you're having a problem

getting your PC or devices to connect with your HDTV, go to Chapter 12, “Troubleshooting Home Theater, HDTVs, and Projectors.”

2. Starting with Chapter 3, “Troubleshooting Internet Problems,” each chapter starts with a feature we call Fast Track to Solutions, a table of symptoms and solutions. Use this table to point you toward underlying problems and their solutions. Start here when you need help fast. Each table lists symptoms common to the parts of your computer or peripherals discussed in that chapter.
3. As soon as you have located the appropriate Fast Track to Solutions symptoms table, look up the symptom. Each symptom sends you directly to a troubleshooting flowchart or book section that covers your problem and its solution.
4. If you are directed to a particular book section, use the text, screen shots, and equipment photos to learn more about how your hardware and software work and to learn the troubleshooting steps needed to solve your problem.
5. If you are directed to a flowchart, each flowchart provides step-by-step solutions with ample cross-references to the text that provide detailed information about the problem and how to find the solution.
6. Use the special elements in each chapter to find valuable tips and shortcuts, discover useful websites, and avoid potential dangers.

Here’s an example of how to use this book to solve a problem.

1. Assume that you can’t start your computer. Chapter 8 covers problems with starting Windows computers and tablets, so turn to the beginning of Chapter 8 to get started. The Fast Track to Solutions symptoms table at the beginning of this chapter offers a flowchart called “Troubleshooting a System That Won’t Start.”
2. Go to the flowchart and follow the solutions given in order. For example, in this flowchart, the first question is, “Is your computer beeping?” If you answer Yes, follow the recommendations to use the beep codes to find and solve the problem. If the answer is No, go to the next question.
3. Read the recommended text sections or view the figures provided as references.
4. Continue through the flowchart until you find the solution that matches your hardware and situation.
5. Use the pictures and screenshots provided to help you locate and use similar features on your system. For many problems, you will use a combination of a flowchart and particular book sections to find the right solution.

How This Book Is Organized

The PC and Gadget Help Desk includes the following sections:

- The first 23 chapters cover all the important hardware and software components of your computer and peripherals.

- Chapter 24 includes a guide to troubleshooting methods and tools and 11 flowcharts to help you solve technology problems.
- The Glossary defines personal technology terms and acronyms.

The following sections explain the book sections in greater detail.

Chapter 1, “PC, Tablet, Mobile Device, Home Theater, Digital Camera, and Camcorder Anatomy 101”

Whatever type of technology problem you’re facing, read this chapter first. It explains the major features of the technology devices this book covers. Wondering what a subsystem is? Confused about software, hardware, and firmware? Want to avoid frying your PC when you upgrade it? Not sure what the ports on your PC, tablet, or digital camera are for? Want to protect the information on your Windows computer? This chapter answers these and many other essential questions.

Chapter 2, “Upgrade, Repair, or Replace?”

When a technology device has a problem, what should you do? This chapter gives you guidelines and case studies to help you figure out whether it’s better to repair or replace a broken device, or whether you should buy upgrades or replace a device that needs a speed or capacity boost.

Chapter 3, “Troubleshooting Internet Problems”

Wi-Fi adapters, routers, switches, cables—there are a lot of components between your device and the Internet. If your network is too slow, if you’re not sure it’s secure enough, or if you need to “borrow” your smartphone’s cellular connection so your other devices can connect to the Internet, this chapter is ready to help.

Chapter 4, “Curing Malware and Stopping Scams”

Viruses, worms, Trojan horses, email scams—malware’s the name, and trouble is its game. Learn how to protect your PCs and mobile devices from threats and discover the clues to scams that threaten your financial and personal information.

Chapter 5, “Solving Problems with Viewing Your Photos and Videos”

Can’t view your photos or videos on your Windows PC, tablet, or mobile device? Discover the software and settings that will help you enjoy your photos, your videos, and your favorite downloads.

Chapter 6, “Keeping Devices Powered Up”

Laptops, tablets, and smartphones all rely on rechargeable batteries. Come to think of it, so do digital cameras and camcorders. Learn how to choose the best charging methods, shop for replacement batteries, and troubleshoot laptop charger problems.

Chapter 7, “Desktop Power Supply Troubleshooting”

If you use a desktop computer, the power supply is one of the components you probably don't worry about. However, when your system starts crashing or it's time to add more hardware, the power supply needs your attention. Learn how to test a power supply, select a new power supply that's good enough for the work it needs to do, and install it. Keep your desktop and mobile devices safe from power problems by discovering how to choose and use surge suppression and battery backup devices.

Chapter 8, “Fixing Windows Devices That Can't Start”

Even if your computer's power supply is working flawlessly, problems with BIOS configuration (the BIOS controls how drives and other devices work at startup), Windows configuration, drive problems, and loose cables can keep your laptop, desktop, or Windows tablet from working. Learn how to recognize common hardware and BIOS problems, and use Windows repair tools such as System Restore and Refresh to get your system back in working order.

Chapter 9, “Solving File Sharing Problems”

Windows 7, 8, and 8.1 use HomeGroup as their preferred network method. Learn how to set it up, troubleshoot symptoms, and fix problems with it. Go beyond HomeGroup networking to stream media and share files with Windows XP, Android, and iOS systems.

Chapter 10, “Troubleshooting Device Sharing”

Networks aren't just for Internet access and folder sharing anymore. Learn how to connect your PC to a wireless printer and use network attached drives with your PC, Android, or iOS device.

Chapter 11, “Troubleshooting Printing”

Whether you use an inkjet or laser printer at home or in the office, problems with print quality, finding the correct printer driver, and using your printer with Android or iOS devices can give you headaches. For fast relief, read this chapter.

Chapter 12, “Troubleshooting Home Theater, HDTVs, and Projectors”

The incredible information and media resources available to your PC or mobile device are limited by small screens and tinny speakers. Connect your PC and mobile devices to home theater systems,

HDTVs, and projectors to fully enjoy music, movies, video, and photos. Learn how to solve problems with cables and configurations.

Chapter 13, “Fixing Slow 3D Gaming”

Nobody likes to lose, and slow 3D performance is a sure way to stay out of the winner’s circle. Learn how to update and tweak AMD and NVIDIA drivers, enable CrossFireX and SLI, find speed plus stability when you overclock your system, and get a better display for gaming.

Chapter 14, “Keeping Your Devices Updated”

From malware threats and hackers to improved drivers, there are plenty of reasons to keep your system updated. Learn how to optimize Windows Update, add support for updating Microsoft Office, install updates manually when necessary, update third-party apps, and update and roll back device drivers. You’ll also discover how to update iOS and Android devices without breaking your bandwidth budget.

Chapter 15, “Dealing with Contrary Memory”

RAM is the fuel that enables your computer to juggle multiple apps at high speed. Learn how to figure out how much you need, choose the right RAM upgrade for your computer, install it, and test it.

Chapter 16, “Keeping Devices Cool”

The CPU, graphics card, and RAM produce a lot of heat inside your computer, and heat can shorten the life of your computer. Learn how to monitor temperatures, keep your desktop or laptop cool, replace defective fans, and what to do if your mobile device is getting warm.

Chapter 17, “Troubleshooting Touchscreens, Keyboards, and Mice”

Whether you enter data and select files with your finger, a keyboard, or a mouse, you need reliable performance from your Windows PC, Android, or iOS device. Learn how to test touchscreens for problems, clean them, choose a stylus, troubleshoot wired and wireless keyboards and mice, use a single receiver with multiple input devices, solve problems with Bluetooth, and customize your mouse’s or touchpad’s behavior.

Chapter 18, “Upgrading and Troubleshooting Storage Devices”

If your hard disk or SSD stops working, you’re on the road to a very bad day. Learn how to get early warnings of storage problems, test your drives for errors, and use Format to try to fix a problem drive. If you’ve deleted important files, learn how to recover them using Windows’ own backup and retrieval tools and third-party data-recovery apps. Running short of space? Discover tips, tricks, and strategies for freeing up space and using cloud storage with Windows, Android, and iOS devices.

Chapter 19, “Software Troubleshooting”

Software that stops working turns your computer into an expensive paperweight. Discover when and how to use an app on a different computer, how to convert a trial mode app into a licensed app without reinstalling it, how to activate an app, how to repair a program (app), and how to trick an old program into running properly on a new version of Windows.

Chapter 20, “Digital Camera Troubleshooting”

Whether you prefer to use a smartphone, point-and-shoot camera, or a camera with interchangeable lenses (digital SLR or compact system camera), problems with exposure, lighting, and white balance can make getting good pictures harder. This chapter shows you how to use your device or camera's semi-automatic and manual settings to get better pictures around the clock, day or night.

Chapter 21, “HD Camcorder and Video Troubleshooting”

You can shoot video with a smartphone, a tablet, most digital cameras, an action camcorder, or a general-purpose HD camcorder. Whichever device you choose, this chapter gives you the guidance you need for clearer, sharper, and better-sounding video.

Chapter 22, “iOS Troubleshooting”

Your iPhone needs to make phone calls, and it, along with your iPad and iPod Touch, is designed to give you mobile access to the Internet and the world. When you can't connect to the Internet, make phone calls, or use FaceTime, it might be time to restart or reset your device. We're here to help you back up your stuff and get your device back into good working order.

Chapter 23, “Android Troubleshooting”

If you can't make a phone call with your Android smartphone or it has stopped working, it might be time for a Factory Reset. Learn how to perform one, why you need to run a third-party backup as well, and find quick references to other Android problems and solutions throughout the book.

Chapter 24, “Troubleshooting Flowcharts”

Whether you've arrived at the flowcharts from a symptoms table or headed straight to the back, you'll find 11 flowcharts to help you with major PC and peripheral problems.

If you're an experienced troubleshooter, the flowcharts might be all you need. However, if you're new to solving your own computer problems, be sure to read the section called “Troubleshooting Methodology.” We've placed it at the front of Chapter 24 so you won't miss it. This section puts our recommendations for tools, techniques, and general troubleshooting philosophy at your fingertips.

Glossary

It's easy to get lost in an ocean of acronyms and terms when you're trying to understand, upgrade, or troubleshoot personal technology. Use the Glossary to explain the unfamiliar and refresh your knowledge.

FIXING WINDOWS DEVICES THAT CAN'T START

Fast Track to Solutions

Table 8.1 Symptom Table

Symptom	Flowchart or Book Section	Page #
My computer displays an error message when it starts	Troubleshooting a System That Displays Errors at Startup (flowchart)	Chapter 24
My computer won't start if I have a USB flash drive plugged into it	Disconnecting USB Drives	200
I see a STOP (blue screen) error when I try to start the computer or after I use it for awhile	STOP (Blue Screen) Errors at Startup	203
I just installed an SSD in place of a hard disk, but my computer isn't any faster	Switching to AHCI Mode in Windows 7 and Windows 8.x	205
I'm not sure the power and data cables to my hard disk are plugged in correctly	Loose Drive Data and Power Cables	208
I think my hard disk has failed. How can I find out for sure?	Drive Failure	212
Windows 7 won't start. What do I do next?	Windows 7 Error Recovery and Advanced Boot Options	213
Windows 8/8.1 won't start. What do I do next?	Windows 8 Error Recovery and Advanced Boot Options	222
How can I find out what System Restore will change before I use it?	Using System Restore, Figures 8.22 and 8.23	218-219
How can I prevent unwanted programs from running when I start my computer?	Using MSConfig	220
I just ran Refresh Your PC in Windows 8/8.1 and some of my programs were removed. How do I find out what's missing?	Figure 8.30	227

Troubleshooting a Windows Tablet or Computer That Can't Start

If you turn on a Windows tablet, laptop, desktop, or all-in-one computer and it powers up, but it won't start Windows, there are two possibilities to check:

- Problems with boot configuration in the system BIOS
- Problems with Windows

In this section, you'll learn the clues for each type of problem and the tools and techniques you need to get your balky system running again.

BIOS Configuration Settings

All recent laptop and desktop computers use either hard disks or solid-state drives (SSDs) that connect via SATA ports to the motherboard. SATA drives can be configured in the system BIOS in three ways:

- IDE
- AHCI
- RAID

Here are a couple of examples. In Figure 8.1, the SATA hard disk drives in this system are set to use AHCI. In Figure 8.2, the SATA drives use the older IDE mode setting.

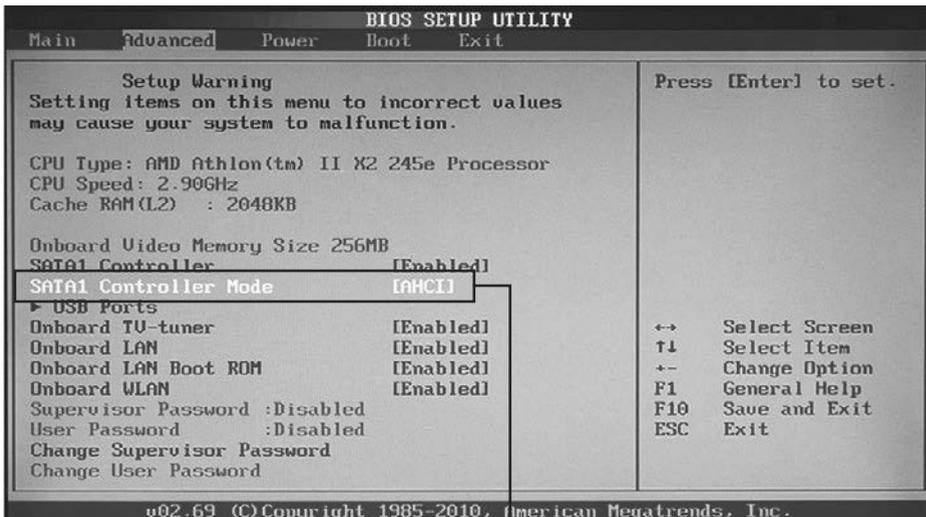
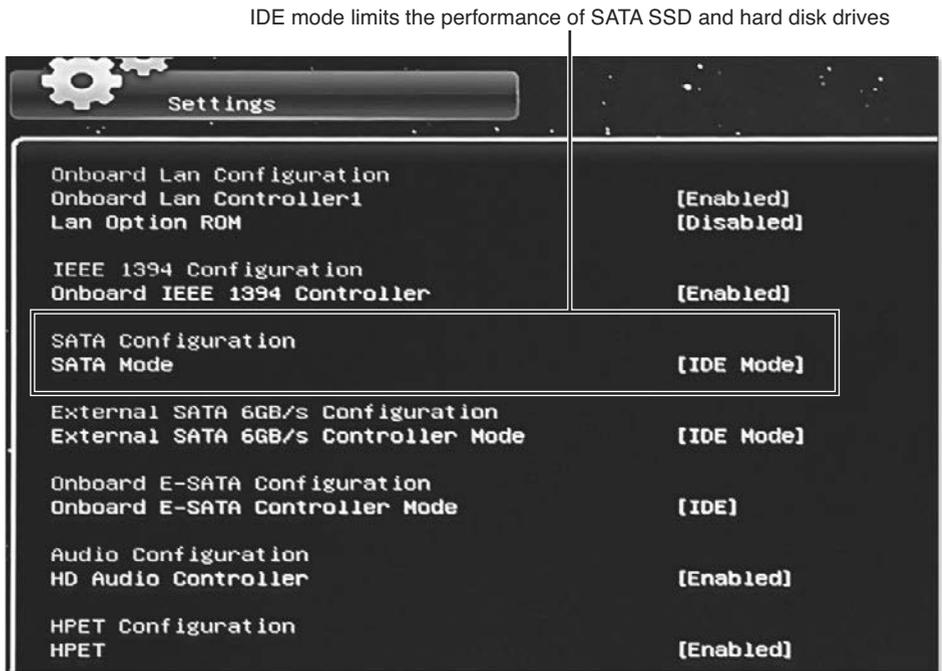


Figure 8.1
SATA drives on this system use AHCI settings.

AHCI mode supports full-speed SATA hard disk and SSD devices

Figure 8.2
SATA drives
on this system
use IDE
settings.



So, what do these settings mean?

- **IDE**—This setting makes the SATA drive act like PATA (IDE) hard disk drives that were once common in Windows-based systems. When this setting is used, the SATA drive can't use advanced features, such as native command queuing and hot-plugging, and SATA 3Gbps and 6Gbps drives run at only 1.5Gbps.
- **AHCI**—This setting supports the SATA drives' advanced functions.
- **RAID**—This setting is used on systems that use two or more drives as a logical unit (RAID 0, RAID 1, RAID 10, and so on).

When Windows is installed on an SATA hard disk, the configuration used in the BIOS or UEFI firmware is recorded in the Windows Registry. Windows checks the Registry at startup to determine how to access the drive. If the drive configuration has changed, Windows crashes.

Note

To know how your system is configured before you have problems, see "Preparing a Windows-based Computer or Tablet for Easier Troubleshooting," Chapter 1, p.37.

Windows Configuration Issues

In addition to incorrect SATA drive configurations, other Windows configuration issues that can prevent Windows from starting include problems with recently installed hardware or apps, corrupt or missing startup files, and corrupt or missing Windows system files.

These errors can cause Windows to display a STOP (blue screen) error. However, Windows is typically configured to restart automatically before this error can be displayed. To configure Windows so that a STOP error stays onscreen so you can determine what it is and look for solutions, see “Configuring Windows to Keep STOP (Blue Screen) Errors Displayed,” Chapter 1, p.41.

BIOS Startup Error Messages and Solutions

When a system has problems starting, it might display error messages at startup. These messages might come from the system BIOS (ROM BIOS or UEFI firmware) or might be generated by Windows. Typical error messages displayed by the BIOS include the following:

- Invalid system disk
- Boot failure
- Hard disk error
- NT boot loader missing
- Missing operating system

These and similar messages indicate that the BIOS or UEFI firmware chip on the motherboard cannot locate startup files for your operating system. Possible reasons can include the following:

- A nonbootable drive containing media is listed first in the boot order (BIOS/UEFI).
- The computer's system drive is not properly identified (BIOS/UEFI).
- Data or power cables from the internal hard disk to the motherboard are loose or have failed (hardware).
- The drive has failed (hardware).

These are listed in order of likelihood. As always, start with the simplest possibility: You've left a USB thumb drive plugged into your computer.

Disconnecting USB Drives

If your system is configured to use USB drives as the first bootable device and you leave a non-bootable USB flash drive plugged into your system (either directly or into a USB hub connected to your system), your system won't boot. Solution? Unplug the drive and restart your system.

If your system restarts correctly, you have a couple of choices:

- Don't leave USB flash drives plugged into your system when you shut down the computer.
- Change your BIOS or UEFI firmware settings to skip USB drives as bootable devices.

Checking and Changing Drive Boot Order

Should you change the boot order? It depends. More and more diagnostic programs can be run from bootable USB flash drives, and you can also install new operating systems from bootable USB flash drives. However, you can also use your system's DVD or BD (Blu-ray) drive for these tasks. So, it's up to you.

We recommend changing the boot order on Windows 7 computers if

- You use USB flash drives to speed up your system using the Windows ReadyBoost feature.
- You frequently use USB flash drives to shuttle information between computers.
- You frequently use USB flash drives for other reasons.

However, you should leave USB flash drives at the top of the boot order if

- You frequently run diagnostic programs from a bootable USB flash drive.
- You install operating systems from a bootable USB flash drive.
- You seldom or never use USB flash drives for data transfer.

Here's how to change the boot order in Windows 7:

1. Click **Start**.
2. Click the right arrow next to the **Shut Down** button.
3. Select **Restart**.
4. After your system restarts, press the key that starts the BIOS or UEFI firmware setup program (see Figure 8.3).
5. Navigate to the dialog used to set the drive boot order (see Figure 8.4).
6. Change the boot order to place the optical drive first, followed by the hard disk.
7. Save your changes and restart your computer.

Windows 8.1 (unlike Windows 8) does not support the creation of a CD or DVD repair disc, although you can use your Windows 8.1 distribution media as a repair disc. With Windows 8.1, if your system supports booting from a USB drive, you should create a USB recovery drive instead.

To learn more, see <http://windows.microsoft.com/en-US/windows-8/create-usb-recovery-drive>.

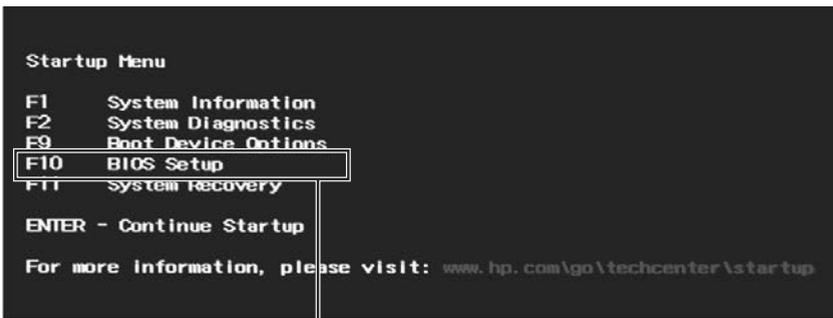


Tip

If you change the boot order to remove USB flash drives or put them after the system hard disk, you can always change the boot order in the future to place USB drives first if you need to run diagnostic programs or install a new operating system.



Prompt for selecting UEFI firmware (BIOS) setup and other options



Press the specified key for ROM BIOS or UEFI Firmware BIOS setup

This system might not boot if a non-bootable USB flash drive is left plugged in at start time

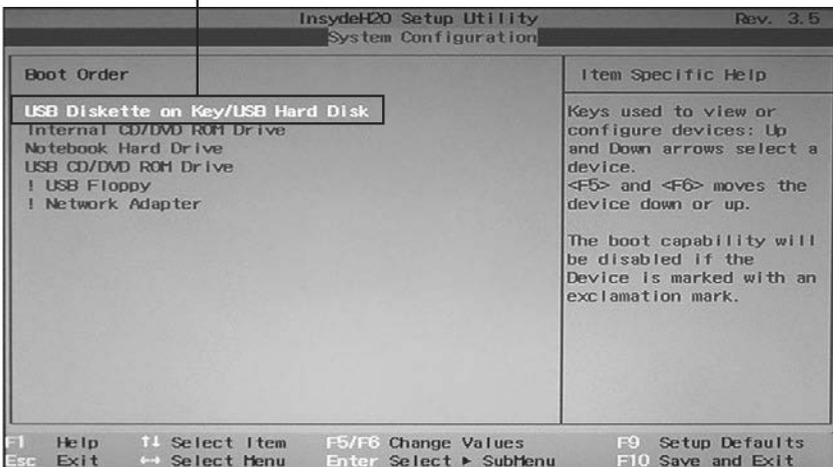


Figure 8.3

On some systems, such as this HP Pavilion DV6 laptop, you might need to press a key (ESC) to see startup options including BIOS setup (F10).

Figure 8.4

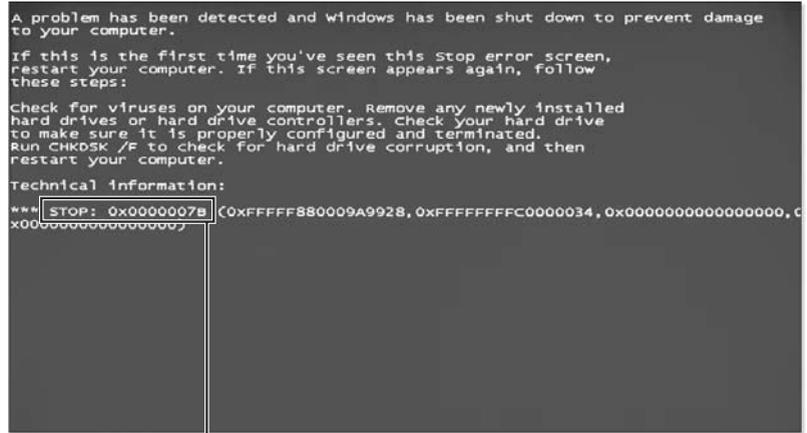
This system looks for USB thumb drives as the first bootable devices.

STOP (Blue Screen) Errors at Startup

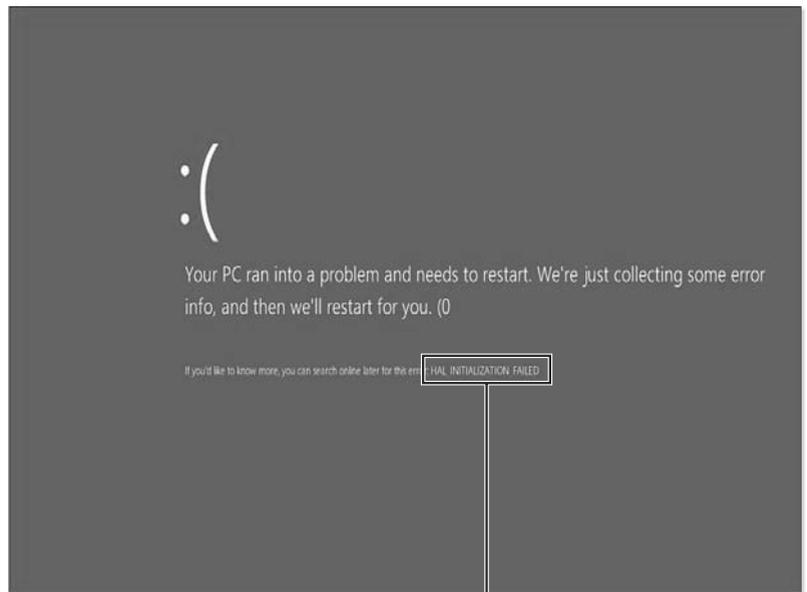
If you turn on your Windows computer and, instead of seeing the Windows login screen or desktop, you see a screen similar to the one shown in Figure 8.5, you have a STOP error, also known as a “Blue Screen” or BSOD (“blue screen of death) error. What happened?

Figure 8.5

A 0x7B STOP error in Windows 7 caused by changing the SATA interface setting in the system BIOS (a). Windows 8 displays a different STOP error (b).



Research this STOP error (0x7B in this example) to determine why Windows 7 crashed



Research this STOP error (HAL_INITIALIZATION_FAILED in this example) to determine why Windows 8.x crashed

Blue-screen errors can be caused by many problems. At startup, they're typically caused by problems with hard disk device drivers. If a blue screen error appears after you have booted to the Windows desktop, it could be caused by corrupt apps, corrupt device drivers, or memory problems.

When you see a BSOD error, be sure to record the numbers listed after the STOP message, such as STOP: 0x0000001E, or 0x1E for short. If the name of the error is displayed, such as KMODE_EXCEPTION_NOT_HANDLED, record it as well. You can then look up the error number and name on the Microsoft Support Site (<http://support.microsoft.com>) to find Microsoft's suggested solutions.

Table 8.2 lists some of the most common STOP errors and possible solutions.

Table 8.2 Common Windows STOP Errors and Solutions

STOP Error Number	STOP Error Name	Suggested Solutions
0xA	IRQL_NOT_LESS_OR_EQUAL	Check device drivers or services used by backup or antivirus utilities.
0xD1	DRIVER_IRQL_NOT_LESS_OR_EQUAL	Check device drivers or services used by backup or antivirus utilities.
0x1E	KMODE_EXCEPTION_NOT_HANDLED	Illegal or unknown instruction; check the driver referenced in the error message.
0x24	NTFS_FILE_SYSTEM	Test the hard disk for errors.
0x2E	DATA_BUS_ERROR	Test memory modules; disable memory caching in system BIOS; check hardware configuration.
0x50	PAGE_FAULT_IN_NONPAGED_AREA	Check printer drivers.
0x7B	INACCESSIBLE_BOOT_DEVICE	Incorrect or missing hard disk device driver; see "Fixing 0x7B Errors," this chapter, for details.
0x7F	UNEXPECTED_KERNEL_MODE_TRAP	Test hardware and RAM; check SCSI configuration if in use; make sure CPU is not overclocked.
0x9F	DRIVER_POWER_STATE_FAILURE	Check power management and CD-writing software; disable power management temporarily; reinstall or upgrade CD-writing software.
0xC21A	STATUS_SYSTEM_PROCESS_TERMINATED	Reinstall third-party programs; use System File Checker with the Scannow option (SFC/Scannow) to check system files.

Unfortunately, Windows is typically configured to restart the system immediately when a STOP error is displayed, so you can't read it. To configure Windows so that a STOP error stays onscreen so you can determine what it is and look for solutions, see "Preparing a Windows-Based Computer or Tablet for Easier Troubleshooting," Chapter 1, p.37.

Fixing 0x7B Errors at Startup

If you are building a computer, have just upgraded to a new hard disk, or have just replaced the motherboard battery that maintains system settings, it's possible that your computer has "forgotten" the correct hard disk configuration settings.

Almost all hard disks are configured using Auto as the hard disk type. Thus, if the setup information is lost, the default (normal) setting is Auto and the drive will be properly detected.

However, the setting for the SATA interface used by your hard disk can be a problem. There are several possible settings for the SATA interface (IDE, AHCI, and RAID), and if your system is configured using one setting, but a different setting is used in the system BIOS or UEFI firmware, your computer won't start, displaying a 0x7B STOP error (refer to Figure 8.5).

If you know the correct setting, follow these steps:

1. Shut down the computer and restart it.
2. Start the BIOS or UEFI firmware setup program.
3. Change the SATA setting to the correct value.
4. Save settings and restart the computer.
5. Select Start Windows Normally if prompted.

Switching to AHCI Mode in Windows 7 and Windows 8.x

If your SATA drives are currently set to run in IDE mode, but you are planning to install an SSD, keep in mind that an SSD cannot provide you with faster performance unless you use AHCI mode. If the system crashes when you change SATA modes, how can you safely change from IDE to AHCI mode?

Before you make the switch, you need to enable Windows to use AHCI drivers when necessary.

The easiest way for Windows Vista and Windows 7 is to use the Fix-It wizard available from <http://support.microsoft.com/kb/922976>. This page also details manual Registry changes that make the same changes as the Fix-It Wizard.

After you run the Fix-It Wizard or make the needed changes manually, you can safely enable AHCI mode in the system BIOS or UEFI firmware setup dialog (refer to Figure 8.8), and your system will install the appropriate drivers and run properly.



Tip

You can also disable rebooting in case of a STOP error with the startup option to Disable Automatic Restart After Failure or Disable Automatic Restart on System Failure. See "Disable Automatic Restart on System Failure," this chapter, p.222.



Tip

If you don't know the correct setting to use in step 3, choose IDE (also known as ATA or Compatible) if the system is set to AHCI, or AHCI if the system is set to IDE, ATA, or Compatible.



Note

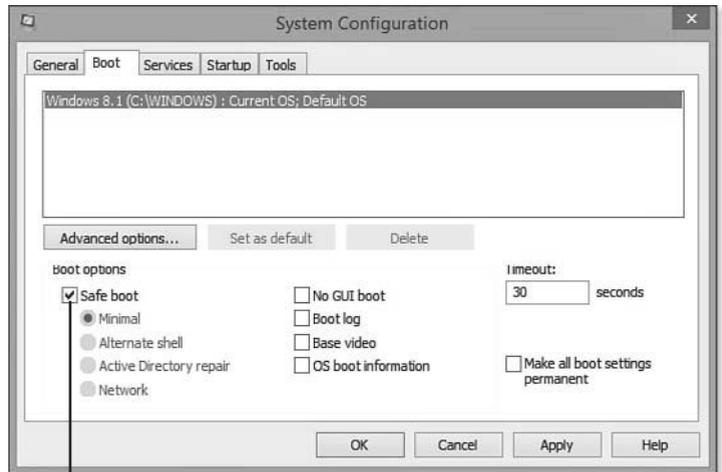
AHCI mode is also recommended for full performance with SATA 3Gbps and 6Gbps hard disk drives.

To switch from IDE mode to AHCI mode in Windows 8.x, follow this procedure (adapted from <http://superuser.com/questions/471102/change-from-ide-to-ahci-after-installing-windows-8>):

1. Search for and run **msconfig.exe**.
2. Click the **Boot** tab.
3. Click the empty **Safe Boot** box (see Figure 8.6).

Figure 8.6

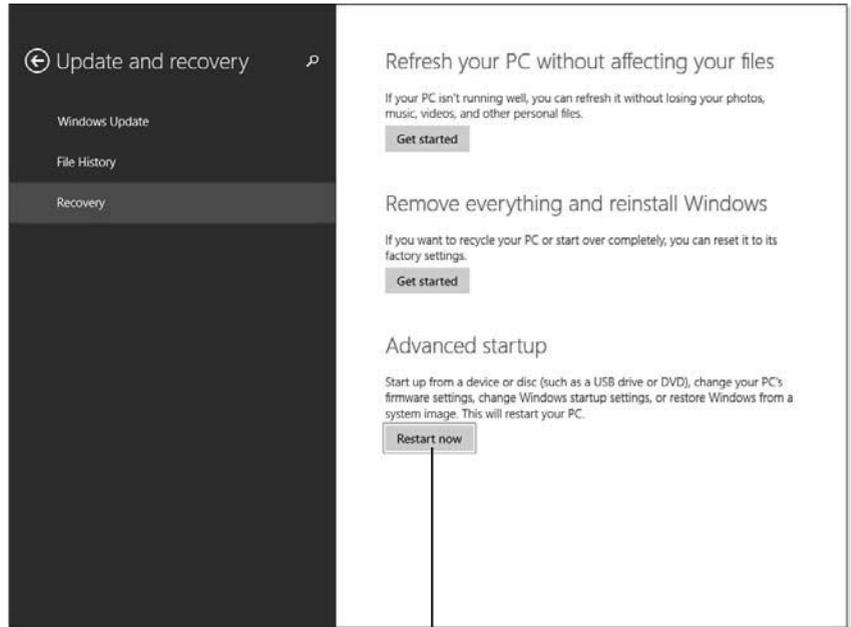
Make sure Safe Boot is checked before you click OK.



Click empty checkbox to enable Safe Boot (safe mode) on next restart

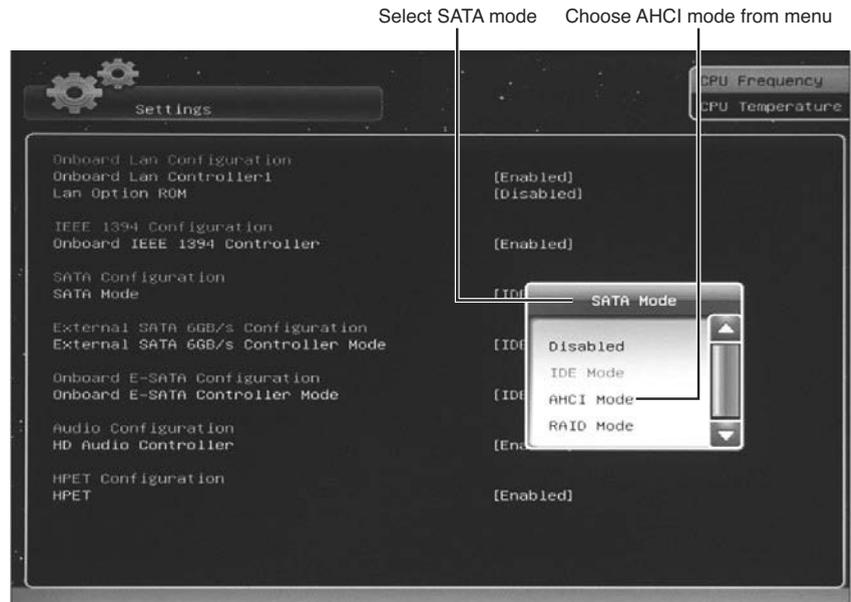
4. Click **OK**.
5. Swipe from the right or move your mouse to the lower-right corner of the screen and click or tap **Settings**.
6. Click or tap **Change PC Settings**.
7. Click or tap **Update and Recovery**.
8. Click or tap **Recovery**.
9. Click or tap **Restart Now** (see Figure 8.7).
10. Press the key or keys needed to enter the UEFI firmware setup program.
11. Change the SATA mode to AHCI (see Figure 8.8).
12. Select the option to save changes and restart your computer.
13. Search for and run **msconfig.exe**.
14. Click or tap the **Boot** tab.
15. Clear the **Safe Boot** check box.

Figure 8.7
Restart Now enables you to change firmware (BIOS/UEFI) settings.



Click to restart and get access to the UEFI firmware (BIOS) setup program

Figure 8.8
Preparing to change a system configured for IDE mode to AHCI mode.



16. Click or tap **OK**.
17. Open the **Charms** menu.
18. Click or tap **Settings**.
19. Click or tap **Power**.
20. Click or tap **Restart**.

Your computer will restart using AHCI mode for full performance of your SATA devices.

Loose Drive Data and Power Cables

The interior of a desktop PC is a cluttered place. Whether you had your system opened up for a memory upgrade, component replacement, or just to see what's "under the hood," you might have loosened or disconnected the power or data cables going to the hard disk or the data cable connecting the hard disk to the motherboard. If your system (C:) drive has disconnected or loose cables, you will see No Operating System or other similar error messages.

Most SATA data cables do not lock into place, so it's easy to have a loose cable on either a drive (see Figure 8.9) or the motherboard (see Figures 8.10 and 8.11).

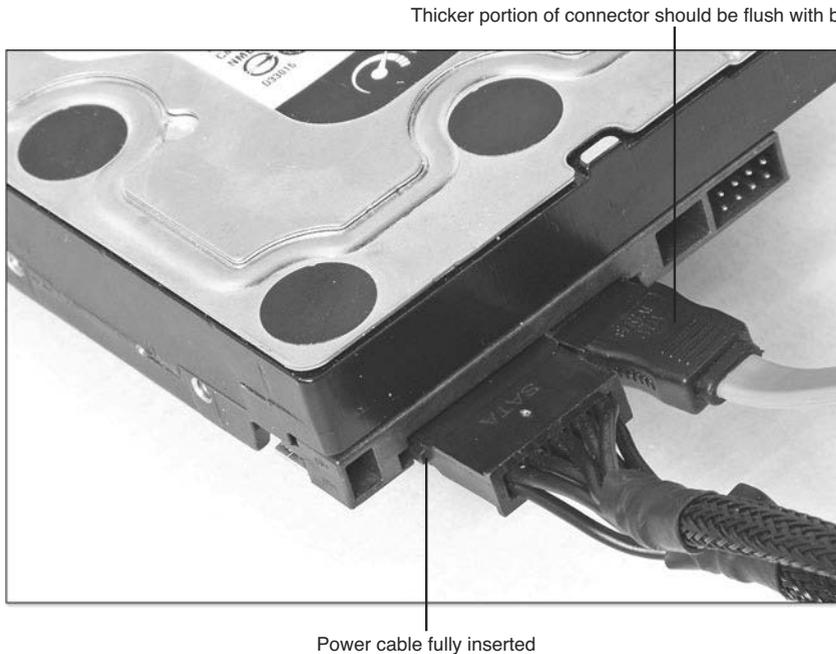
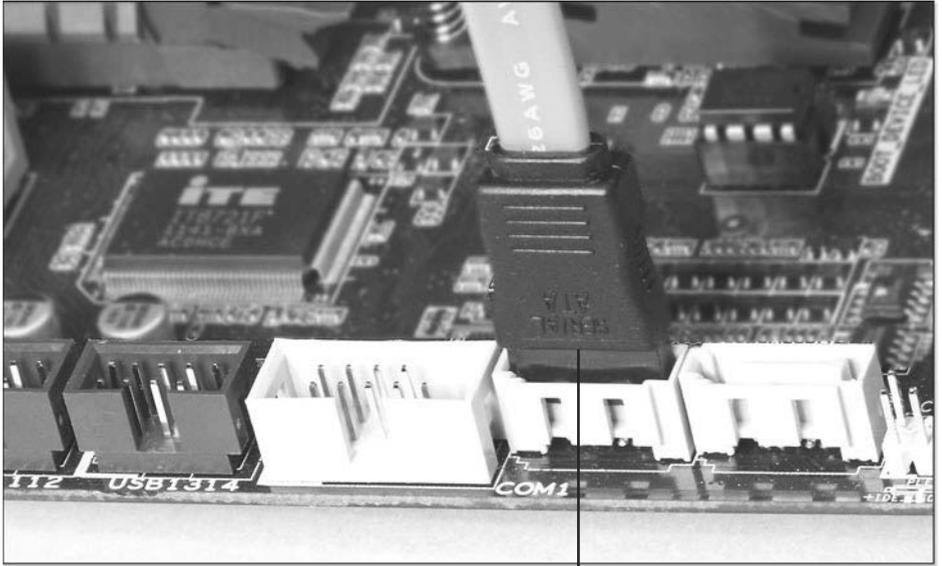


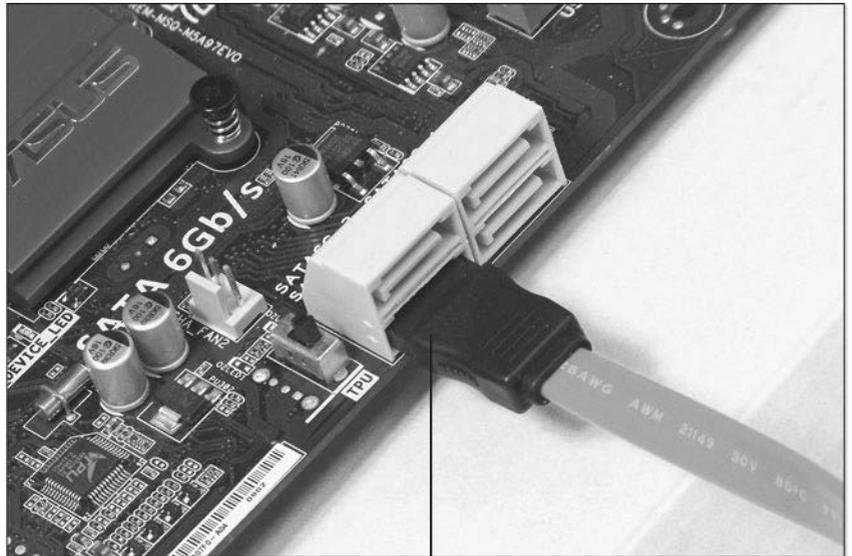
Figure 8.9
Loose data
cable on an
SATA hard
disk.

Figure 8.10
An SATA
mother-
board host
adapter
with a loose
data cable.



Push cable all the way into SATA port

Figure 8.11
Some mother-
boards use front-
mounted SATA
ports, like this one,
which also features
a loose data cable.



Push cable all the way into port

Similarly, SATA power cables can come loose from drives (see Figure 8.12).

Figure 8.12
The power cable on this SATA drive is not connected tightly.

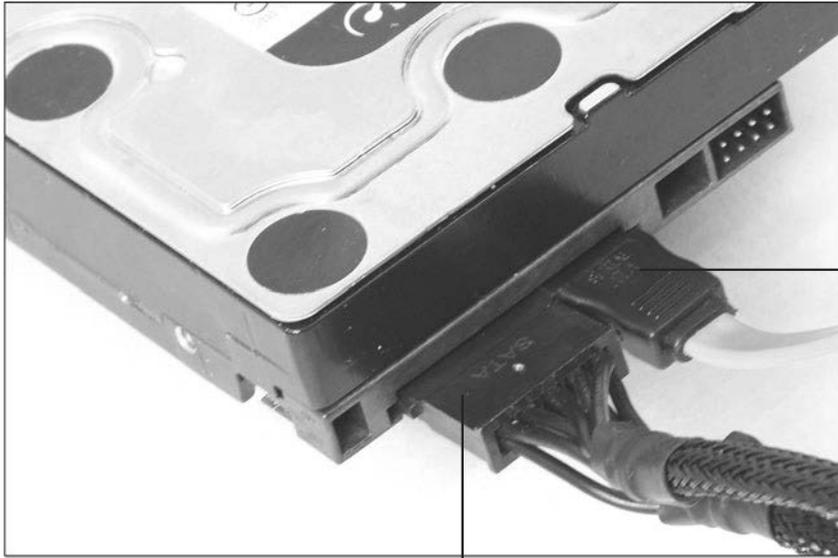


Push power cable all the way into port

To solve problems with loose or disconnected cables:

1. Shut down the computer.
2. Disconnect the power supply from AC power.
3. Open the system.
4. Check the hard disk or SSD for loose or disconnected cable(s).
5. Check the motherboard for loose or disconnected SATA data cables.
6. Securely plug the cable(s) into place (see Figures 8.13, 8.14, and 8.15).
7. Close the system.
8. Reconnect the power supply to AC power.
9. Restart the computer.

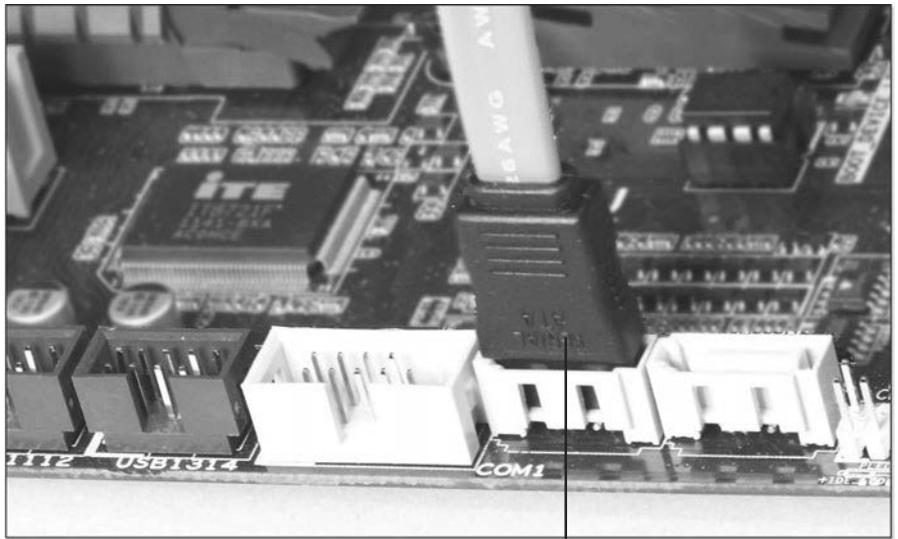
Figure 8.13
An SATA hard disk with properly connected power and data cables.



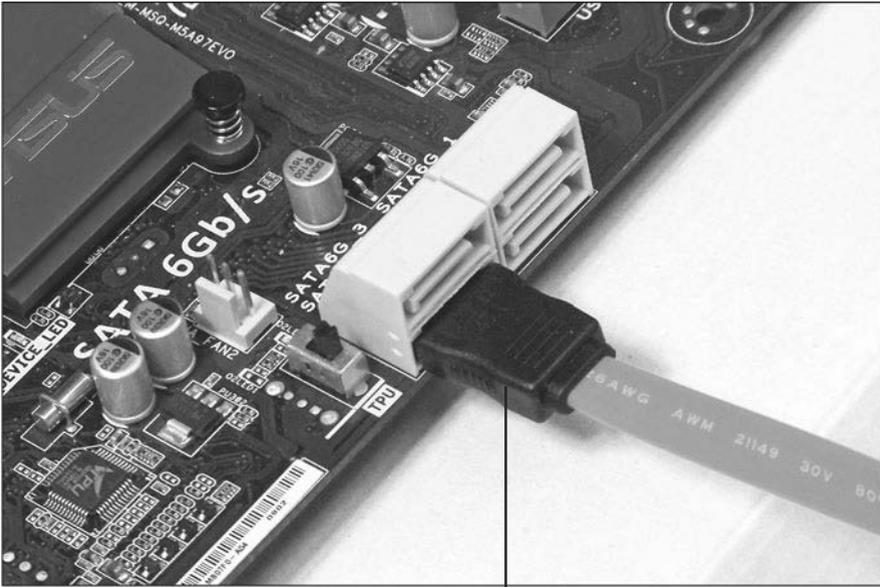
Data cable completely inserted

Power cable completely inserted

Figure 8.14
A correctly installed SATA data cable plugged into a top-facing motherboard port.



SATA data cable completely inserted



Fully-inserted SATA data cable

Figure 8.15
A correctly installed SATA data cable plugged into a front-facing motherboard port.

Drive Failure

If your hard disk is making a loud or rattling noise when it's running, it has probably failed. If the hard disk was dropped or smacked hard, a failure is very likely.

However, a hard disk might have failed if it is absolutely silent even when you place your ear next to it or does not get warm after the system has been on for several minutes.

Before assuming a hard disk has failed, perform this isolation test to determine whether the problem is the hard disk, its power cable, or its data cable:

1. Shut down the computer.
2. Disconnect the power supply from AC power.
3. Open the system.
4. Locate the power cable running between the hard disk and the power supply.
5. Disconnect the power cable from the power supply.
6. If the power cable used a splitter or converter to provide power to the drive, plug the drive directly into the power supply (if possible). If that is not possible, replace the splitter or converter and make sure it is securely plugged into the power supply lead and the drive.
7. Reconnect the power supply to AC power.

8. Restart the computer.
9. If the drive is still not working, repeat steps 1 and 2.
10. Reconnect the drive to the original power cable (and splitter or converter).
11. Remove the data cable from the hard disk drive and the computer.
12. Install a known-working replacement cable.
13. Plug it into the SATA port on the motherboard and drive.
14. Repeat steps 7 and 8.
15. If the drive is still not working, the drive has failed. Replace it.



Note

If you have backed up your information, you can replace your hard disk and restore your system from a backup. However, if you have no backup and the information is vital, you can use a data recovery company to recover your data. These companies have clean rooms that enable safe replacement of failed components and advanced data-extraction techniques. Expect to pay hundreds of dollars for recovery – if the drive's condition permits it.

Windows 7 Error Recovery and Advanced Boot Options

If Windows 7 is unable to start normally, Windows will display the Windows Error Recovery dialog. On a system that does not have Startup Repair files installed, the Windows Error Recovery dialog looks like the one in Figure 8.16. You can use a Windows installation disc or a Windows repair disc to repair your computer.

On a system that has Startup Repair files installed, the Windows Error Recovery dialog provides the options shown in Figure 8.17 when your system can't start.

On a system that didn't shut down properly the last time it was used (for example, if you used the power button because the system locked up), Windows Error Recovery offers Safe Mode options, Last Known Good Configuration (advanced), or Start Windows Normally.



Tip

To learn how to create a Windows 7 repair disc, see "Preparing a Windows-Based Computer or Tablet for Easier Troubleshooting," Chapter 1, p.37.

Prompt to use installation disc or repair disc to repair Windows

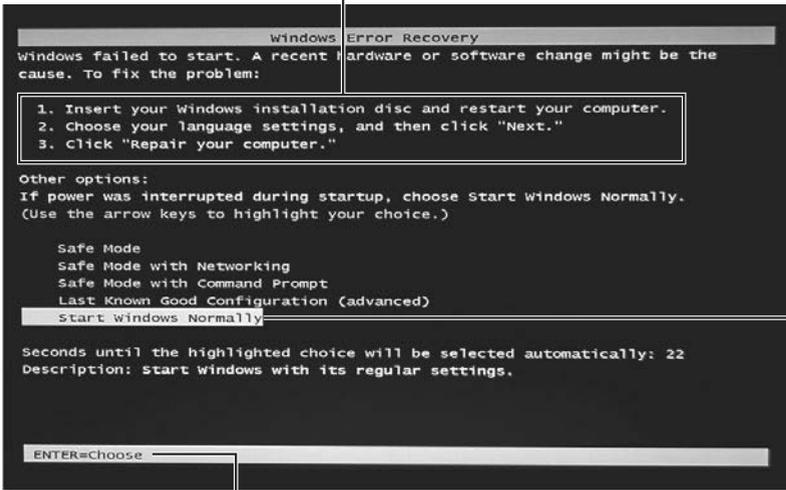


Figure 8.16
Windows 7 displays this type of message if Startup Repair files are not available on a system that can't start.

Use up-arrow and down-arrow keys to highlight desired option

Prompt to press Enter key to use selected startup option

Use up-arrow and down-arrow keys to highlight desired option

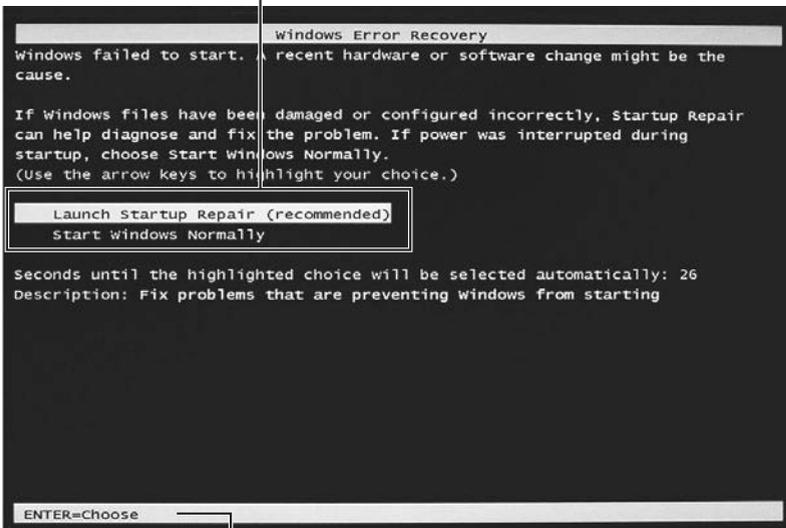


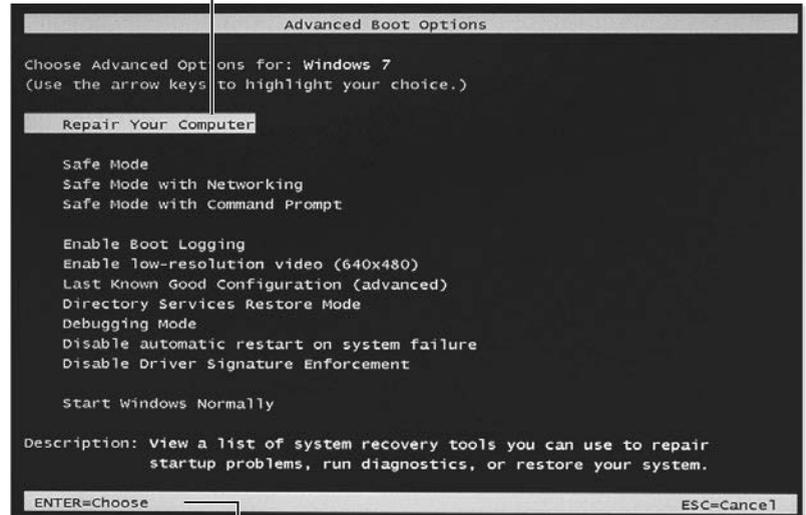
Figure 8.17
Windows 7 displays this type of message if Startup Repair files are available on a system that can't start.

Prompt to press Enter key to use selected startup option

If you suspect that Windows is not working as well as it could, but Windows 7 does not launch Windows Error Recovery, you can still choose from these and other options by pressing F8 repeatedly on startup until the Advanced Boot Options menu shown in Figure 8.18 appears.

Figure 8.18
Windows 7's Advanced
Boot Options menu.

Use up-arrow and down-arrow keys to highlight desired option



Prompt to press Enter key to use selected startup option

Using Windows 7 Repair Tools

Windows 7's repair tools can be accessed in a variety of ways. Table 8.3 provides a quick reference to these tools and how to access them.

Table 8.3 System Repair Tools for Windows 7

Repair Tool	How Used	How to Use
Automatic System Repair (Startup Repair)	Repairs system and startup files	Runs automatically as needed or can be launched from Recovery Environment (repair disc)
System Restore	Resets Windows hardware and software settings back to a specified date	Recovery Environment
Command Prompt	Uses commands to copy or delete files, changes Windows settings, and other command-line functions	Recovery Environment

Repair Tool	How Used	How to Use
Safe Mode	Loads essential Windows drivers and services only	Advanced Boot Options or Windows Error Recovery
Safe Mode with Networking	Loads essential drivers and Windows services plus basic network services only	Advanced Boot Options
Safe Mode with Command Prompt	Loads essential drivers and Windows services but boots to command prompt	Advanced Boot Options
Last Known Good Configuration	Loads Windows with the last known good configuration	Advanced Boot Options
Enable Boot Logging	Creates text log of all startup processes	Advanced Boot Options
Enable Low-Resolution Video	Starts Windows with basic VGA driver	Advanced Boot Options
Disable Automatic Restart After Failure	Keeps STOP (blue screen) error on-screen until you restart system manually	Advanced Boot Options
System Image Recovery	Restores a system image backup to the system drive (or an empty hard disk)	Recovery Environment
Windows Memory Diagnostic	Tests RAM memory modules for errors	Recovery Environment

Using Automatic Startup Repair

If Windows is unable to start because of damaged or missing system files, you should run Automatic Startup Repair. Automatic Startup Repair scans your system drive for problems and attempts to repair them.

If Startup Repair is successful, you have the option of seeing a report dialog (see Figure 8.19). A typical report dialog is shown in Figure 8.20.

Figure 8.19
Click the link to see the repairs performed on this system.

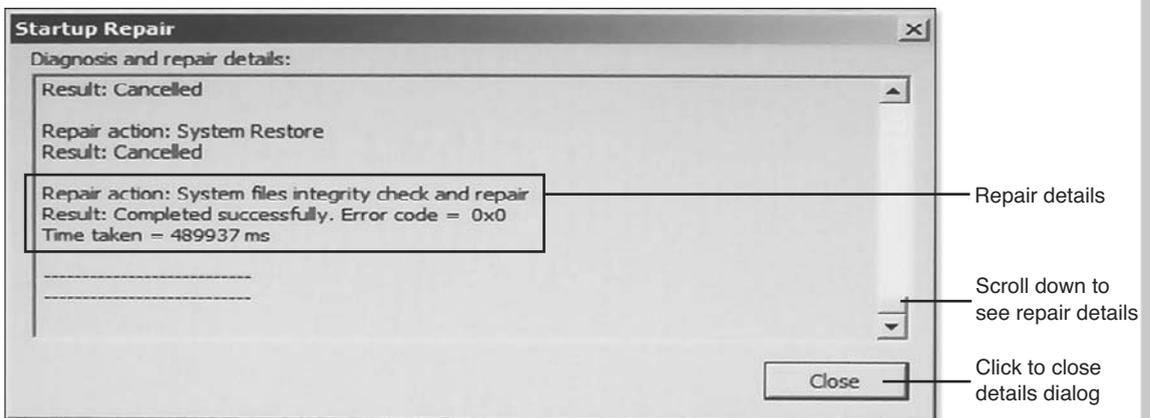
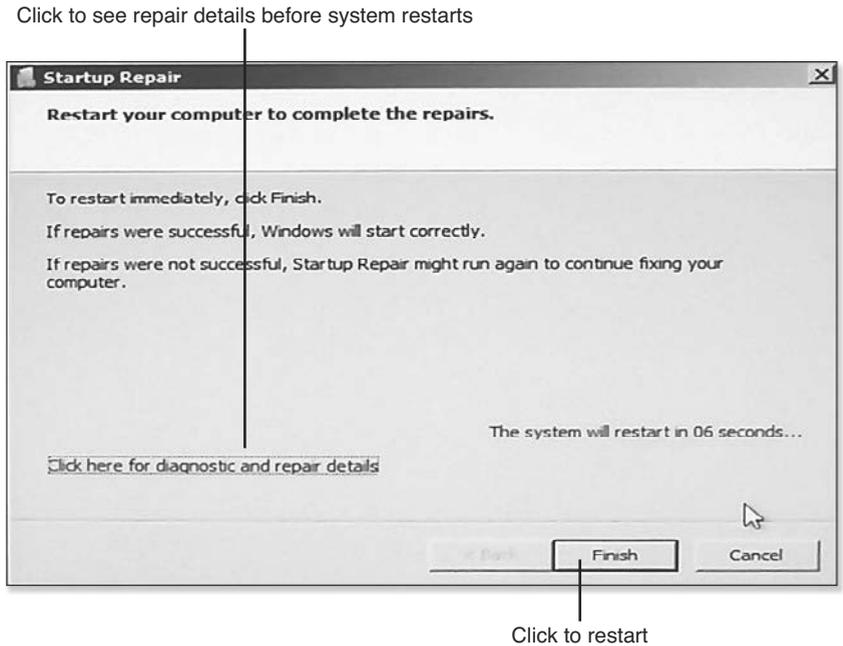


Figure 8.20
Scroll down through the report to see the tests performed and their results.

If repairs were not successful, you can choose from other repair tools (see Figure 8.21).

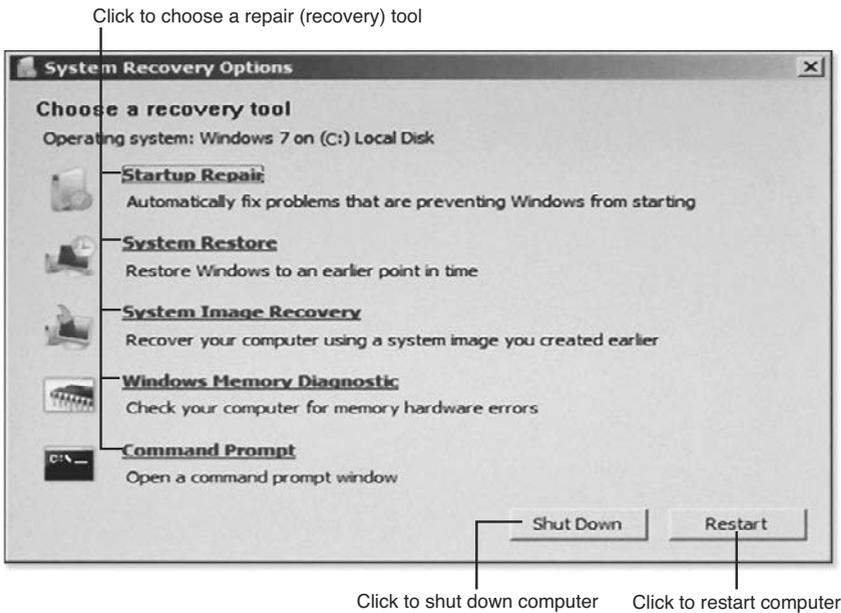


Figure 8.21
System Recovery Options in Windows 7's Windows Recovery Environment.

Note

You can also launch the System Recovery Options (also known as Windows Recovery Environment) dialog shown in Figure 8.21 by starting your system with the Windows 7 installation disc or a Windows 7 repair disc.

Using System Restore

During Startup Repair, you might be prompted to use System Restore. If your system has stopped working after a recent hardware upgrade, driver update, or app (software) installation, use System Restore to restore your system configuration to what it was at a date before the change.

Periodically, Windows creates restore points, which save the state of Windows in case of future problems. When you run System Restore, choose a restore point that is just before the event that is causing problems for your system (see Figure 8.22).

To see which programs or drivers will be affected, click the Scan for Affected Programs link. Programs and drivers that will be removed are listed on top, followed by programs and drivers that will be restored (see Figure 8.23).

After you confirm the restore point to restore, Windows restores the settings as they were and restarts your computer.

Note

You can also run System Restore from the Windows 7 Recovery Environment or from the Windows 8.x Advanced Options menu.

Caution

Programs and drivers that will be restored might not work properly. Plan to reinstall any programs or drivers listed.

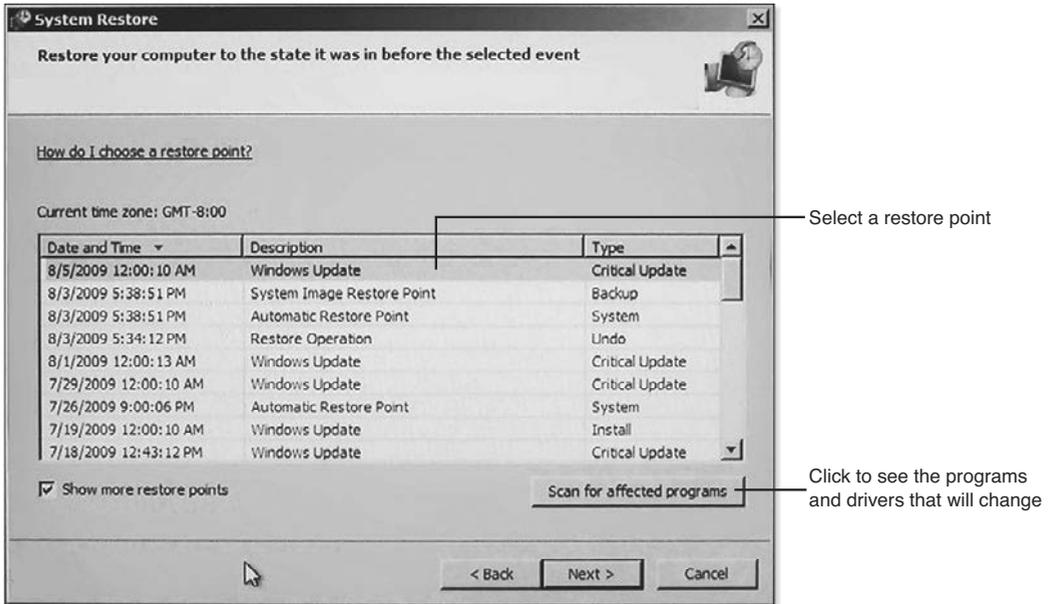
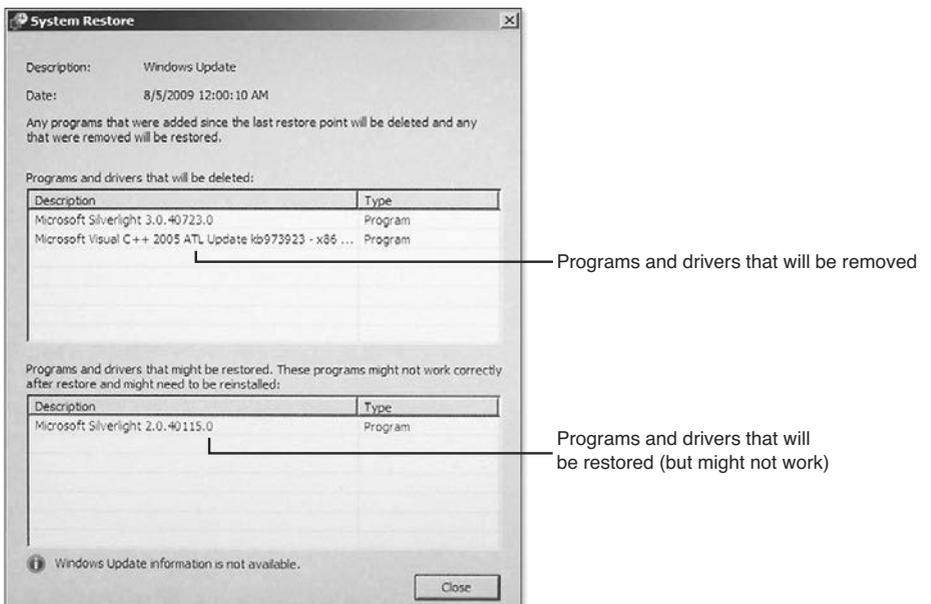


Figure 8.22
Selecting a date with System Restore.

Figure 8.23
When System Restore runs on this computer, two programs will be deleted, and one will be restored.



Using Last Known Good Configuration

This Windows 7 feature enables you to restart the computer if it won't start, but it started correctly the previous time. The settings used are the ones stored with the last successful boot.

Using Safe Mode Options

If Windows starts, but has problems shutting down or has video problems, it might be because of a malfunctioning video card or other driver or a malfunctioning startup program or service. To determine whether a driver is the problem, select **Safe Mode**. Safe Mode starts up the computer with a limited set of drivers and services. Selecting **Safe Mode with Networking** adds support for basic network and Internet services (use this option so you can research problems online and download replacement drivers). Choose **Safe Mode with Command Prompt** to boot Windows to the command prompt with limited drivers and services.

In Safe Mode, you can open Device Manager and disable or update device drivers (if you use Safe Mode with Networking, you can get updates from the Internet). You can also run MSConfig to selectively disable startup programs and services before you reboot, use Event Viewer to see problems with your computer, and use the Registry Editor to make manual changes to how Windows runs.

Note

For a list of the drivers and services launched in Safe Mode and Safe Mode with Networking, go to <http://windows.microsoft.com/en-us/windows/which-drivers-loaded-safe-mode>. Select Windows 7 or Windows Vista from the pull-down menu to see the applicable list.

Using MSConfig

Some Windows and most third-party programs and services will not run in Safe Mode. Thus, if your computer works properly in Safe Mode, you need to determine which program or service is causing the problem. To do this, start your computer in Safe Mode and run MSConfig to disable all startup programs and services:

1. Start MSConfig (use Search to locate it on your system).
2. Click the **Selective Startup** button on the **General** tab.
3. Clear the **Load Startup** Items check box (see Figure 8.24).
4. Click the **Services** tab.
5. Click the empty **Hide all Microsoft Services** check box.
6. Click **Disable All** (see Figure 8.25).
7. Click **Apply**.
8. Click **OK**.
9. Restart your system.

Figure 8.24
Disabling the Load Startup Items option with Microsoft System Configuration (MSConfig).

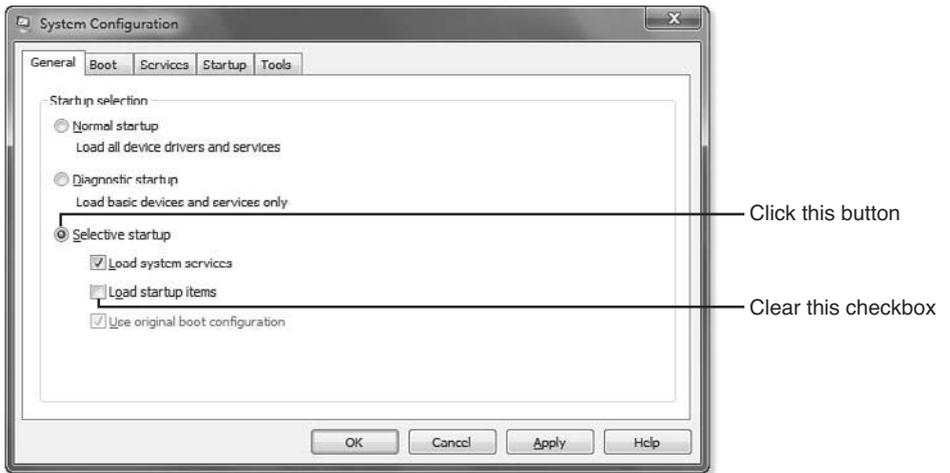
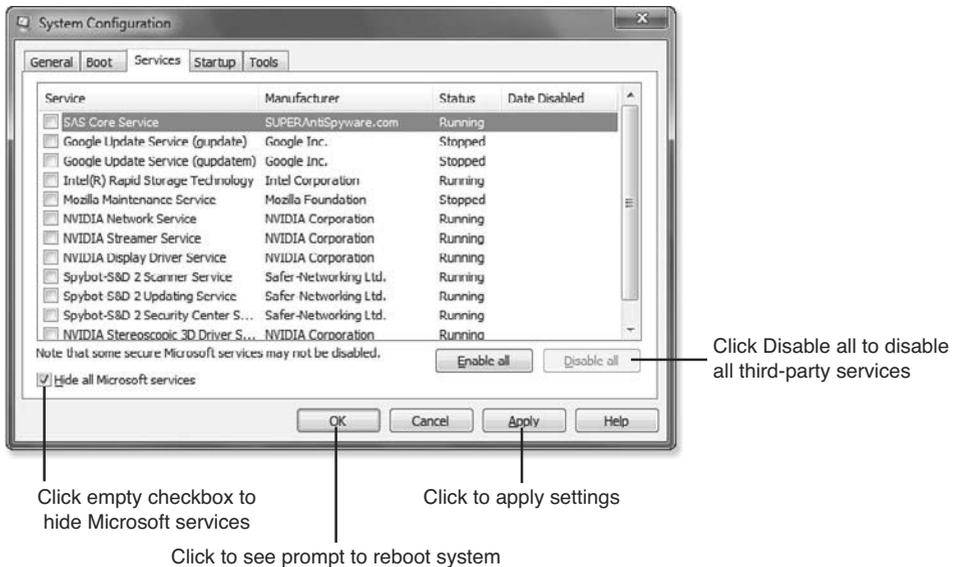


Figure 8.25
The Services tab after hiding Microsoft services and disabling third-party services.



What's next? If your system starts normally, either a startup item or a non-Microsoft service is causing problems. To find out, enable one non-Microsoft service at a time until the system won't start normally. Uninstall the app or program that uses the service.

If you are able to enable all non-Microsoft services and your system boots normally, restart MSConfig and select **Normal Startup** on the General tab. Click the **Startup** tab and disable startup items you're not sure you need or that you don't recognize. Restart your system. If it starts normally, one of the items you disabled is your problem.

Enable Low-Resolution Video

Use this startup option if you suspect that problems with your video card's driver is causing system crashes, such as during 3D gaming. Your system will run normally, except for using a low screen resolution. You can adjust the resolution after the system starts, and you can adjust or replace your video card's driver files before restarting.

Disable Automatic Restart on System Failure

Use this option to start your computer if a STOP (blue screen) error occurs during or after startup and the system reboots too quickly to see the full message. If a STOP error happens after you use this option, Windows will leave the error message onscreen until you restart your computer.

System Image Recovery

You can create a system image backup with the Backup and Restore utility in Windows 7. A system image is a backup of the system drive (typically C: drive) that includes Windows and system files.

If you have replaced a hard disk or have a badly corrupted system that can't be fixed, you can restore a system image with this utility.

Windows 8 Error Recovery and Advanced Boot Options

If a system running Windows 8.x doesn't launch Windows, the system reboots and runs Automatic System Repair. If it is unable to repair the problem, you will be prompted to shut down your computer or click **Advanced Options**, which opens the Choose an Option dialog shown in Figure 8.26.

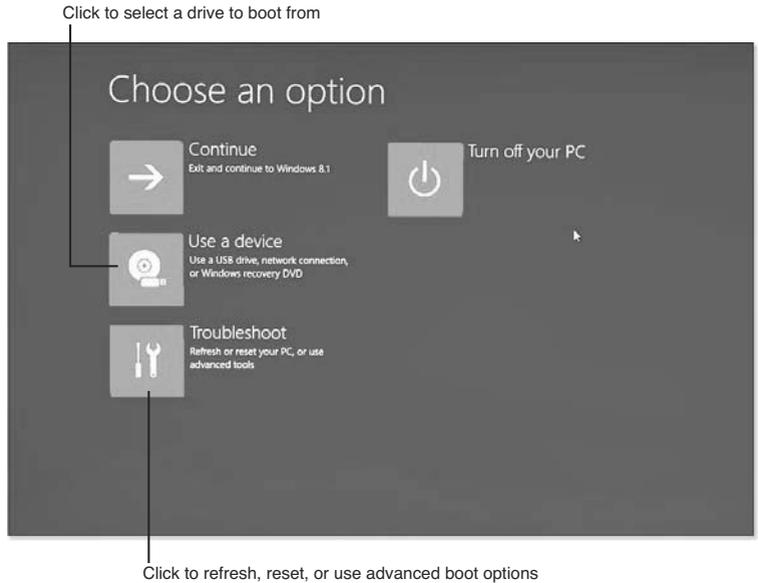
Click **Troubleshoot** to select options to Refresh Your PC, Reset Your PC, or see Advanced Options (see Figure 8.27).

Note

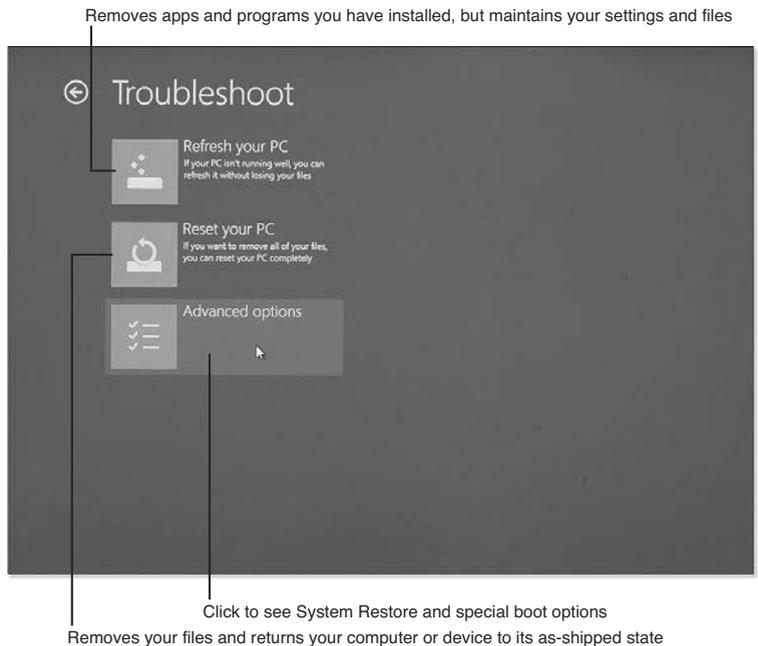
If you want to restore a complete backup (system image) made with a third-party backup program that uses a bootable USB or optical disc, insert that drive or disc, then choose **Use a Device**, and choose the drive to reboot from.

Figure 8.26

You can boot from a Windows USB drive or disc, choose from troubleshooting tools, turn off your computer, or try to restart Windows 8.1 from the Choose an option menu.

**Figure 8.27**

The Troubleshoot dialog lets you refresh or reset your PC.



The Advanced options dialog (see Figure 8.28) provides options for accessing your system via the command prompt, for changing your computer's UEFI firmware settings, and more.

If you select **Startup Settings** from the Advanced menu, you will see the options shown in Figure 8.29.

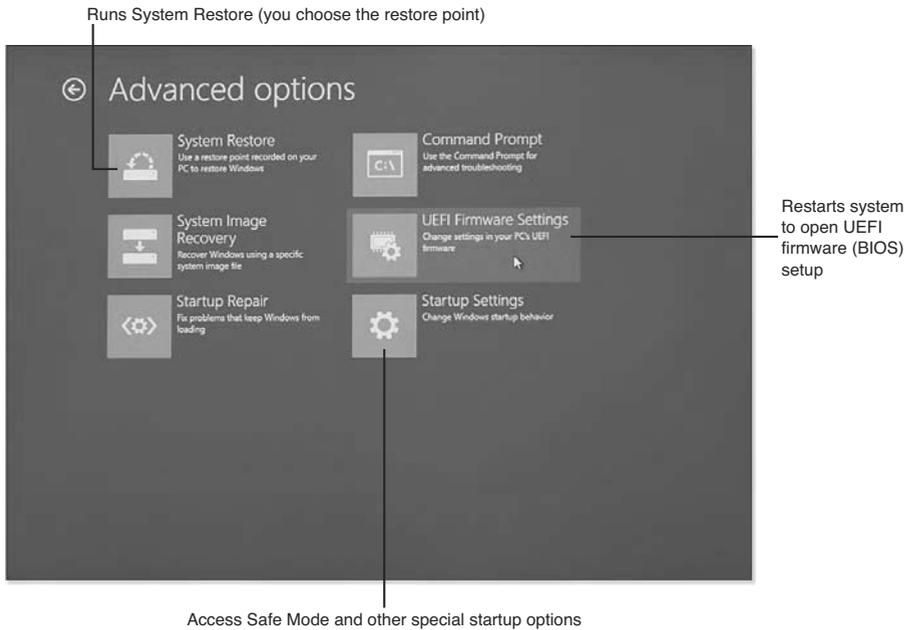


Figure 8.28 Use the Advanced Options menu to run System Restore, repair startup files, use Startup settings such as Safe Mode, or change UEFI firmware settings.

Press the number key or F-number key for the option to run

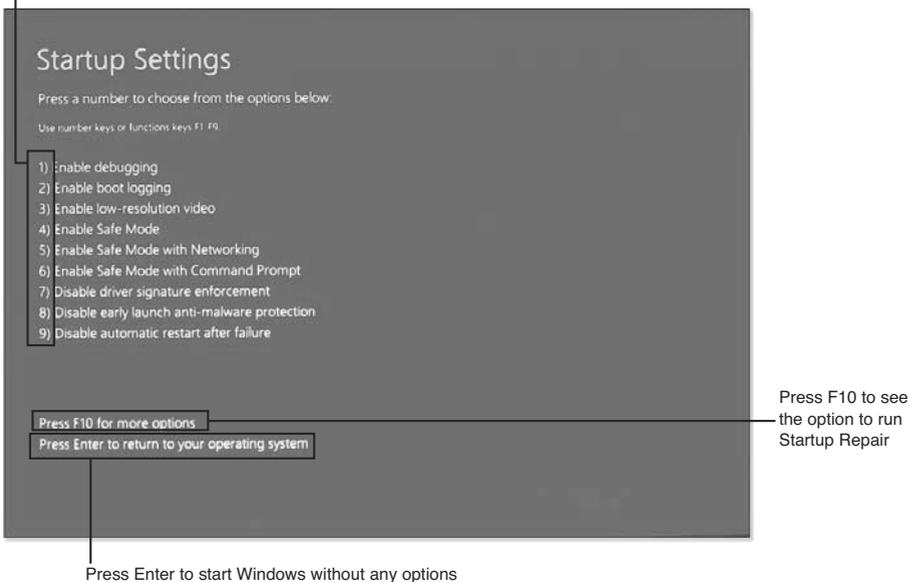


Figure 8.29 Choose an option to restart your system.

Using Windows 8/8.1 Repair Tools

Windows 8/8.1's repair tools can be accessed in a variety of ways. Table 8.4 provides a quick reference to these tools and how to access them.

Table 8.4 System Repair Tools for Windows 8/8.1

Repair Tool	How Used	How to Use
Automatic System Repair (Startup Repair)	Repairs system and startup files	Runs automatically as needed or can be launched from Recovery Environment (repair disc)
Refresh Your PC	Removes non-Windows Store apps and returns Windows to proper operation without removing user files	Launches from Troubleshoot dialog
Reset Your PC	Returns Windows to its as-shipped configuration (removes user files)	Launches from Troubleshoot dialog
System Restore	Resets Windows hardware and software settings back to a specified date	May be offered during Startup Repair or launched from Advanced Options dialog
Command Prompt	Uses commands to copy or delete files, change Windows settings, and other command-line functions	Launches from Advanced Options
Safe Mode	Loads essential Windows drivers and services only	Launches from Startup Settings
Safe Mode with Networking	Loads essential drivers and Windows services plus basic network services only	Launches from Startup Settings
Safe Mode with Command Prompt	Loads essential drivers and Windows services but boots to command prompt	Launches from Startup Settings
Use a Device	Selects a drive (SSD, hard disk, USB, or optical) to boot from	Launches from Troubleshoot dialog
System Image Recovery*	Refreshes Windows from a specific image backup file so you can keep your desktop (non-Windows Store) apps	Launches from Advanced Settings
UEFI Firmware Settings	Starts the UEFI firmware (BIOS) setup program	Launches from Advanced Settings
Enable Boot Logging	Creates text log of all startup processes	Launches from Startup Settings
Enable Low-Resolution Video	Starts Windows with basic VGA driver	Launches from Startup Settings

Repair Tool	How Used	How to Use
Disable Automatic Restart After Failure	Keeps STOP (blue screen) error onscreen until you restart system manually	Launches from Startup Settings

**You can create a custom recovery image using the command-line `recimg.exe` program.*

Note

To learn more about using `recimg.exe` to create a custom image backup with Windows 8/8.1, see <http://blogs.msdn.com/b/b8/archive/2012/01/04/refresh-and-reset-your-pc.aspx> and <http://support.microsoft.com/kb/2748351>

Many of these options work the same way as in Windows 7, but two options in this list are unique to Windows 8/8.1: Refresh Your PC and Reset Your PC. They're covered in the following sections.

Refresh Your PC

Windows 8 introduced Refresh Your PC as a way to solve major problems with your computer without wiping out your information. Windows 8.1 also includes Refresh Your PC.

If you are unable to start your computer or have other major problems with it, choose **Refresh Your PC** from the Troubleshoot menu shown in Figure 8.27. Refresh Your PC removes programs you installed but does not disturb your personal files. After you run it, your system reboots. At that point, you will need to reinstall apps and software you have downloaded from sources other than the Windows Store or installed from optical or USB media (apps you installed from the Windows Store or that were bundled with your computer are not affected). If you want to keep these apps, create a custom refresh image using `recimg.exe` and start the refresh process with System Image Recovery (refer to Figure 8.28).

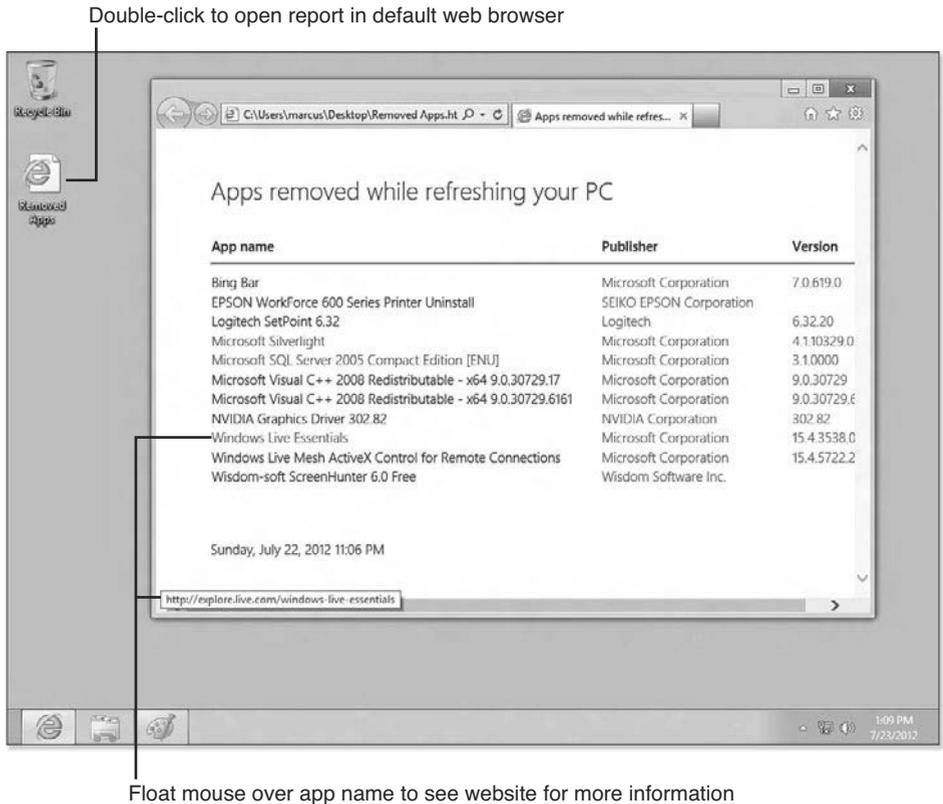
Windows displays a list of removed apps on the Windows Desktop after your system restarts.

Figure 8.30 shows an example of the Apps Removed report after running refresh on a system running Windows 8.

Caution

If your system was originally set up with Windows 8 and you have updated it to Windows 8.1, keep in mind that using Refresh Your PC resets your computer to Windows 8. You will also need to reinstall Windows 8.1 from the Windows Store.

Figure 8.30
Windows 8.x stores removed apps as an HTML file on the Windows Desktop after you refresh your system.



Reset Your PC

If it's time to give your PC to another user, or to sell it or recycle it, the one thing you don't want left on it is any personal information. Use **Reset Your PC** to set your Windows 8.x system back to its original out-of-the-box condition.

Before you reset your PC, be sure to do the following:

- Disconnect all external drives connected to your computer.
- Back up any of your personal files on internal drives.

To use Reset Your PC, you will need a Windows 8.x installation disc or a USB Recovery drive.

During the process, you are prompted to delete your files from all drives or from the Windows drive only. Choose **All Drives** to remove your files from all internal drives.



Tip

To learn how to back up your files, see "Preparing a Windows-Based Computer or Tablet for Easier Troubleshooting," Chapter 1, p.37.

If you are planning to keep the computer and just need to reset it to its out-of-the-box configuration, choose **Just Remove My Files**. However, to completely overwrite your files to prevent recovery (recommended if the device is being sold, given away, or recycled), choose **Fully Clean the Drive** when prompted.

At the end of the process, you will be prompted to accept the license terms and perform other first-time setup tasks. The “new” Windows installation will prompt for activation if necessary.



Tip

To learn how to make a USB Recovery drive, see “Preparing a Windows-Based Computer or Tablet for Easier Troubleshooting,” Chapter 1 p.37.

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