Chapter 1

Start Here First

You picked up this book for any of several reasons. You may be eyeing Windows 7, Microsoft's newest version of Windows, and want to upgrade your computer to meet Windows 7's needs. Perhaps one of your computer's parts died, and you're looking for a replacement. Or maybe your computer simply needs some fine-tuning. Either way, start with this chapter.

This chapter starts with the easy stuff by letting you know when it's time to upgrade, and when it's time to simply throw in the towel and buy a new computer.

You discover how to find out what version of Windows lives on your computer, as well as how to identify the CPU and amount of memory hiding inside your computer's case.

This chapter also explains how to identify every part inside your computer's case, so you can see if your computer meets those fine-print system requirements listed on the side of many software boxes.

To keep your work as light as possible, this chapter explains where Windows 7 has the power to repair itself — *if* those powers are turned on and running correctly, that is. You find complete instructions on making sure the self-healing abilities of Windows Update and System Restore are up and running.

Remember, anytime you're not sure what plugs in where, check out this book's Appendix. It's a visual directory of all your computer's connectors and the gadgets that will fit into them.

Determining When to Upgrade

Your computer usually tells you when it wants an upgrade. Some warning signals are subtle, others more obvious. At worst, they can be downright annoying.

In any case, keep track of the following when you're deciding whether it's time to open the wallet and grab the toolbox:

- **When your operating system demands it:** The latest version of Windows, Windows 7, is easily Microsoft's best operating system in years. If you've caught the "latest and the greatest" fever, it's easy to find out if your computer is up to snuff; Microsoft lists Windows 7's system requirements at `http://windows.microsoft.com/systemrequirements`, and I dissect them in Chapter 18.

- **When you keep waiting for your computer to catch up:** You press a button and wait. And wait. When you're constantly working faster than your computer, give your computer a boost with some extra memory and a faster video card.

- **When you can't afford a new computer:** When a new computer's out of your price range, upgrade your computer one part at a time. Add that memory now, for example, then add a new hard drive with that holiday bonus. Time each purchase to match the lowest prices. When you finally buy your new computer, save costs by salvaging your monitor, as well as new parts you've added to your old computer.

- **When you want a new part in a hurry:** Computer repair shops aren't nearly as slow as most repair shops. Still, do you *really* want to wait four days for some kid to install that new video card — especially when you have a nagging suspicion that you could do it yourself in less than 15 minutes?

- **When there's no room for new software:** When your hard drive constantly spits up Disk Full messages, you have three options:

  - Uninstall programs you no longer use and copy unneeded files to CDs or DVDs. (This takes a lot of time.)

  - Better yet, replace your computer's hard drive with a larger and faster one, a task covered in Chapter 6. (Windows 7 makes this easier than ever.)

  - Buy a removable drive to serve as a parking garage for files and programs, also covered in Chapter 6. Most external drives plug into your computer's USB port, a chore as simple as plugging in a thumb drive.

- **When you're afraid to open the case:** Fear of opening your computer's case is no longer an excuse to put off upgrades. Many new computer parts now live on the *outside* of the computer. You find external DVD drives and burners, hard drives, memory card readers, sound boxes, and much more. None of these devices require popping open the case to install them.

Determining When You Shouldn't Upgrade

Sometimes, you shouldn't upgrade your own computer. Keep your hands off during any of the following circumstances:

✔ **When a computer part breaks while under warranty:** If your new computer is under warranty, let the manufacturer fix it. In fact, trying to fix or replace a part sometimes voids the warranty on the rest of your computer. Some manufacturers void the warranty if you simply open your computer's case. Read the warranty's fine print before grabbing a screwdriver.

TIP

Keep track of your warranty expiration date; it's usually listed on your sales receipt. Lost it? Some manufacturers (Gateway, Dell, and a few others) provide access to your warranty information through their Web sites, as described in Chapter 21.

✔ **On a Friday:** Don't try to install a new computer part on a Friday afternoon. When you discover that the widget needs a *left* bracket, too, many shops will be closed, leaving you with a table full of detached parts until Monday morning.

✔ **When you're working on a deadline:** Just like kitchen remodeling, computer upgrading sometimes takes twice as long as you'd originally planned. Most parts install in a few minutes, but always allow yourself a little leeway.

✔ **If your computer is *old:*** Not all computers can be upgraded. If you bought your computer before 2004, you're probably pouring money into a sinking ship. Check out your Windows Experience Index in Windows 7, described in Chapter 18, and see how well your computer's CPU rates. (Old CPUs are expensive to upgrade, making a new computer a better deal.) Or, if you're running Windows XP, download Windows Upgrade Advisor, also in Chapter 18, to see if your computer's still powerful enough for Windows 7.

TIP

Before upgrading a computer, check these numbers: Add the cost of needed parts (more memory, a bigger hard drive, a faster video card and/or monitor, a DVD burner, and updated software, including Windows 7) and compare it with the cost of a new computer. Chances are, a new computer costs less. Plus, it already comes with Windows 7, and its parts will all be compatible.

Upgrade Do's and Don'ts

Over the years, as hungry computer repair technicians swapped tales of occupational stress, they gradually created a list known as The Upgrade Do's and Don'ts. The following tips have all been salvaged from lunchroom discussions across the nation and placed here for quick retrieval.

Do upgrade one thing at a time

Even if you've just returned from the computer store with more memory, a wireless network card, a new hard drive, and a new monitor, don't try to install them all at once. Install one part and make sure that it works before going on to the next part. If you can stand it, wait a day to make sure no problems turn up.

If you install more than one part at the same time and your computer doesn't work when you turn it on, you may have trouble figuring out which particular part is gagging your computer.

Do make a restore point before every upgrade

The Windows System Restore feature does a great job of reinstating your computer's settings that made it run smooth and clean. However, System Restore works only if your computer has a restore point for it to return to.

If you're installing anything that involves software, drivers, or setup programs, head to the section, "Making sure System Restore is working," later in this chapter. That section describes how to make your own restore points to supplement the ones Windows automatically creates. So, make a restore point that describes what you're about to do: Before installing that wireless network adapter, for instance, make a restore point with the name, "Before installing the new wireless network adapter."

Then, if the wireless network adapter bulldozes your finely tuned network settings, System Restore can return to those peaceful days when your network buzzed happily, giving you time to troubleshoot the problem.

Do watch out for static electricity

Static electricity can destroy computer parts. That's why many computer parts, especially things on circuit cards, come packaged in weird, silvery bags that reflect light like the visor on an astronaut's helmet. That high-tech plastic stuff absorbs any stray static before it zaps the part inside.

To make sure that you don't zap a computer part with static electricity, you should discharge yourself — no matter how gross that sounds — before starting to work on your computer. Touch a piece of bare metal, like the edge of a metal desk or chair, to ground yourself. You also must ground yourself each time you move your feet, especially when standing on carpet, wearing slippers, or after moving the cat back out of the way.

If you're living in a particularly static-prone environment, pick up a wrist-grounding strap at the computer store. (They usually sell them near the packages of memory.)

Do hang on to your old boxes, manuals, warranties, and receipts

When you need to pack up your computer for a move, nothing works better than its old box and packaging material. I keep mine on the top shelf in the garage, just in case I move. Don't bother hanging on to the smaller boxes, though, like the ones that come with a video card or mouse.

Hang on to *all* your old manuals, even if you don't understand a word they say. Sometimes a new part starts arguing with an older part, and the manuals often have hints on which switch to flip to break up the fight. At the least, they list the part's model number, an important fact when troubleshooting.

Just push some dust mice aside under the bed and slide all the manuals under there.

Don't force parts together

Everything in your computer is designed to fit into place smoothly and without too much of a fight. If something doesn't fit right, stop, scratch your head, and try again using a slightly different tactic.

When trying to plug a cable into the back of your computer, for example, look closely at the end of the cord and then scrutinize the plug where it's supposed to fit. See how the pins are lined up a certain way? See how the plug's shape differs on one side? Turn the plug until it lines up with its socket and push slowly but firmly. Sometimes it helps if you jiggle it back and forth slightly. Ask your spouse to tickle you gently.

Things that plug directly into things *inside* your computer seem to need the most force. Things that plug onto the *outside,* by contrast, slip on pretty easily. They also slip off pretty easily, so some of the cables have little thumb screws to hold everything in place firmly.

Don't bend cards

Many of your computer's internal organs are mounted on fiberglass boards. That's the reason there's a warning coming up right now.

Don't bend these boards, no matter how tempting. Bending the board can break the circuits subtly enough to damage the card. Worse yet, the cracks can be too small to see, so you may not know what went wrong.

If you hear little crackling sounds while you're doing something with a board — plugging it into a socket or plugging something into it — you're pushing the wrong way. Stop, regroup, and try again. Check out Chapter 9 and make sure you're pushing the right type of card into the right slot.

How to fish out dropped screws

When a screw falls into the inner reaches of your computer, it usually lands in a spot inaccessible to human fingers. The following should call it back home:

- ✓ Is it in plain sight? Try grabbing it with some long tweezers. If that doesn't work, wrap some tape, sticky-side out, around the end of a pencil or chopstick. With a few deft pokes, you may be able to snag it. A magnetized screwdriver can come in handy here, as well.

- ✓ If you don't see the runaway screw, gently tilt the computer to one side and then the other. Hopefully, the screw will roll out in plain sight. If you can hear it roll, you can often discover where it's hiding.

- ✓ Still can't find it? Pick up the computer's case with both hands, gently turn it upside down, and tilt it from side to side. The screw should fall out.

- ✓ If you still can't find the screw and it's not making any noise, check the floor beneath the computer. Sometimes screws hide in the carpet, where only bare feet can find them.

Don't power up your computer until you can account for every screw, or you'll find yourself with even worse problems: a shorted-out motherboard. (Give your computer a final shake before putting the case back on. Any lost screws will announce their presence with a telltale rattle.)

Don't rush yourself

Give yourself plenty of time to install a new part. If you rush yourself or get nervous, you're much more likely to break something, which can cause even more nervousness.

Start early in the week, or even on a Sunday, so you'll know the stores will be open the next day if something goes wrong.

Don't open up monitors or power supplies

You can't repair anything inside monitors or power supplies. Also, the power supply stores up voltage, even when it's not plugged in.

Don't ever try to open your power supply or monitor! They can store electricity inside that may really zap you.

Do Your Prep Work

Before beginning to upgrade, make sure you've fastened your seat belt by carrying out all the steps in the following sections.

Turn on Windows Update

Bored youngsters work late nights probing Windows to locate programming problems. When they discover a new flaw, they write a *virus* or *worm* (a small, malicious program meant to do damage, such as erasing important files) to take advantage of it. These kids release the virus, and it begins damaging people's computers as it spreads worldwide.

When alerted to a new *security exploit,* as they're called, Microsoft programmers scratch their heads and wonder what's wrong with today's youth. Then they release a special piece of software to fix the problem. To grab that special software, called a *patch* or *update,* your computer needs *Windows Update*.

Microsoft's free Windows Update program automatically downloads patches that plug the latest holes found in Windows' defenses. Windows Update works only if it's turned on, however. Follow these steps to make sure Windows Update is turned on and working to protect your computer.

1. **Click the Start button and choose Control Panel. Then choose System and Security, as shown in Figure 1-1.**

   The System and Security window appears. If you see a sea of icons rather than what's shown in Figure 1-1, click the Windows Update icon, and click Change Settings from the window's left pane.

   Still using Windows XP? Then click the Start button, click Control Panel, and click Security Center.

Figure 1-1: After you open the Control Panel, choose System and Security.

2. **In the Windows Update section, click Turn Automatic Updating On or Off, as shown in Figure 1-2.**

   The Windows Update Settings window appears. (Here, Windows XP users should click "Turn on Automatic Updates" if the updates are turned off.)
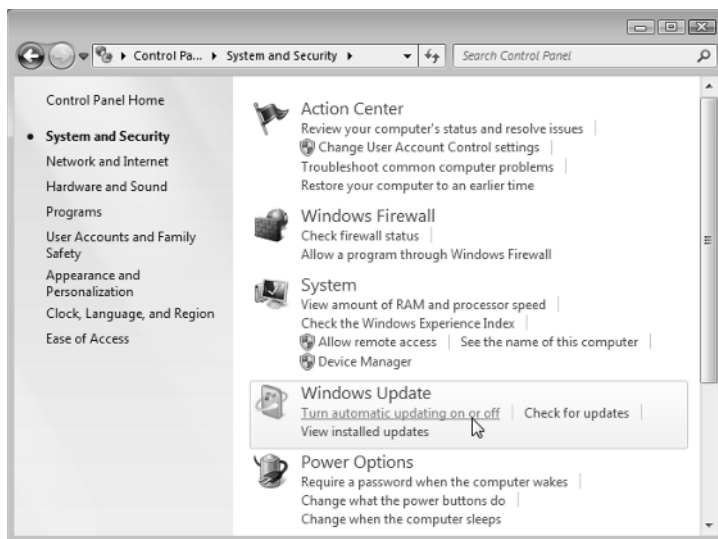

Figure 1-2: Click in the Windows Update section to find settings for turning on Automatic Updates.

3. **In the Important Updates section, shown in Figure 1-3, choose Install Updates Automatically, and click the OK button to save your settings.**
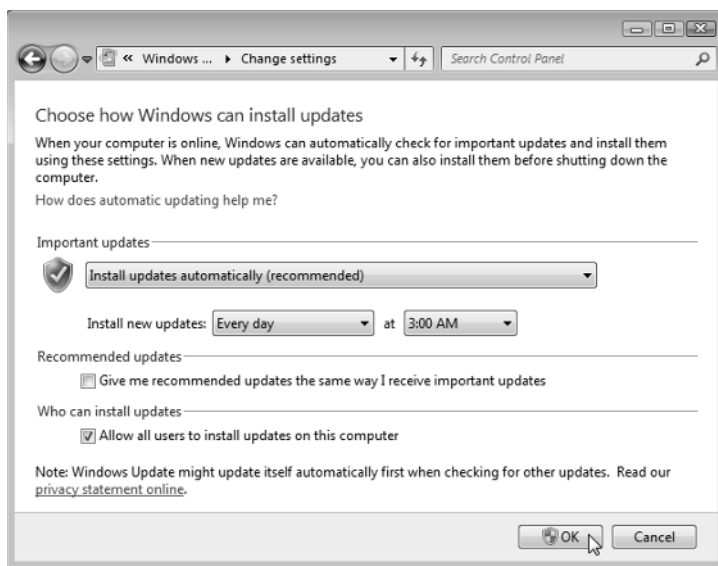

Figure 1-3: When the Install Updates Automatically option is selected, Windows Update can automatically update your computer.

The downloaded updates normally install every day at 3 a.m. If you normally turn off your computer at night, change the installation time to the afternoon by clicking the 3:00 AM drop-down and choosing a different time.

Windows Update organizes patches into two categories. *Always* install the ones in the Important Updates category, as they contain patches for security problems. You needn't install updates from the Recommended Updates categories unless you think they will correct problems you're currently experiencing with your computer.

Making sure System Restore is working

System Restore, built into Windows 7, Windows Vista, and Windows XP, often works miracles for problematic computers. If your computer suddenly stops working correctly, System Restore often enables you to bring your computer back to a time when everything worked fine.

When it's working correctly, System Restore automatically creates restore points that save important settings when Windows is up and running smoothly. The more restore points you have available, the more options you have for finding a time when your computer was running strong and lean.

You can also create your own restore point, a useful tool before installing a new part or software, by following these same steps.

To make sure System Restore's running — or to fix it if it's not working correctly — follow these steps:

1. **Click the Start button, right-click Computer, and choose Properties, as shown in Figure 1-4.**
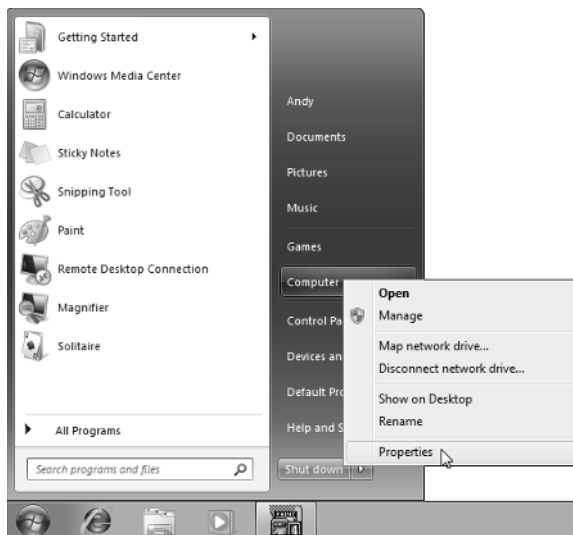
   The System window appears.

Figure 1-4: Check in with Sytem Restore via your computer's Properties option.

2. **From the System window's left pane, click System Protection, as shown in Figure 1-5.**

   The System Properties window appears, opened to the System Protection tab.

3. **Select the drive called System, if necessary (it's usually already highlighted, as shown in Figure 1-6), and click the Configure button. Or, to create a restore point, click the Create button.**

4. **Choose the setting called "Restore System Settings and Previous Versions of Files," as shown in Figure 1-7. If necessary, slide the Max Usage bar to the right until it shows around 5%. Then click the OK button to save your changes.**

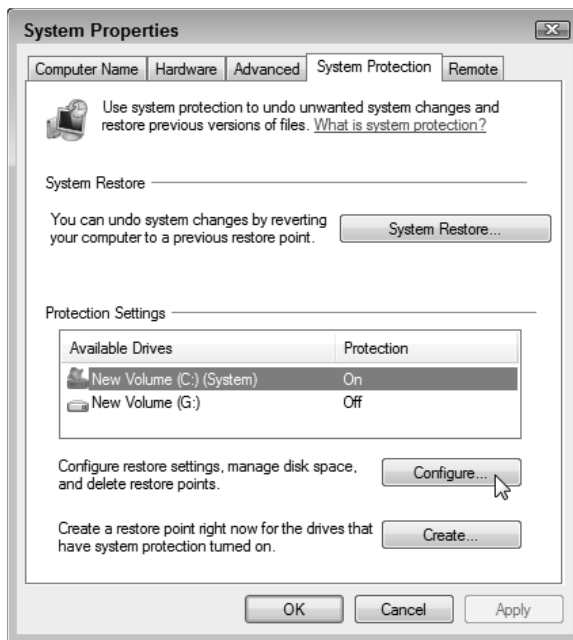**Figure 1-5:** Click the System Protection option.

Figure 1-6: Click the Configure button to find System Restore setup options; click the Create button to create a restore point.

Figure 1-7: You set options for System Restore in this dialog box.

Identifying your Windows version, CPU, and amount of memory

Computers come in a wide variety of makes and models pieced together with parts made by a variety of manufacturers. So how do you know who made what part?

Luckily, Windows takes pity on its users and tells you exactly what parts lurk inside your computer — you don't even need to remove its case. The first step is finding out your Windows version, your computer's central processing unit (CPU), and its amount of random access memory (RAM).

And why should you care, you might ask, shifting impatiently in your chair? Because when you buy computer software or parts, the box's fine print lists the system requirements, followed by lots of details about what your computer must have to use the software or part. If your computer doesn't meet those detailed requirements, the software or part won't work very well — if at all — on your computer.

WARNING!

To add insult to injury, many stores won't let you return software — even if it doesn't work on your computer. Some stores even refuse to accept *unopened* software. Check your store's return policy before opening your wallet.

Follow these steps to locate your version of Windows, your computer's type of CPU, and its amount of memory.

1. **Click the Start button, right-click Computer, and choose Properties. (Refer to Figure 1-4.)**

2. **In the Windows Edition section, look to see your version of Windows, as shown in Figure 1-8.**

   In the System section, look at the System Type line to see whether you're running the *32-bit* or *64-bit* version of Windows. Thinking about upgrading your memory? You need a *64-bit* version of Windows to access 4GB or more of memory. (I explain the difference between 32-bit and 64-bit versions of Windows in Chapter 18.)

   Using Windows XP? Your version of Windows appears in the System section.

3. **In the System section, look at the Processor line to see your computer's type of CPU, and its speed in gigahertz (GHz).**

   Windows XP users will find their processor and amount of memory listed in the Computer area.

4. **In the System section, look at the Installed Memory line to see your amount of memory.**

   This particular computer contains 4GB of memory. But because it's running a 32-bit version of Windows, only 3.25GB of that memory can be used; the rest of the memory in this computer is wasted. The moral? Don't upgrade a 32-bit version of Windows to more than 4GB of memory.
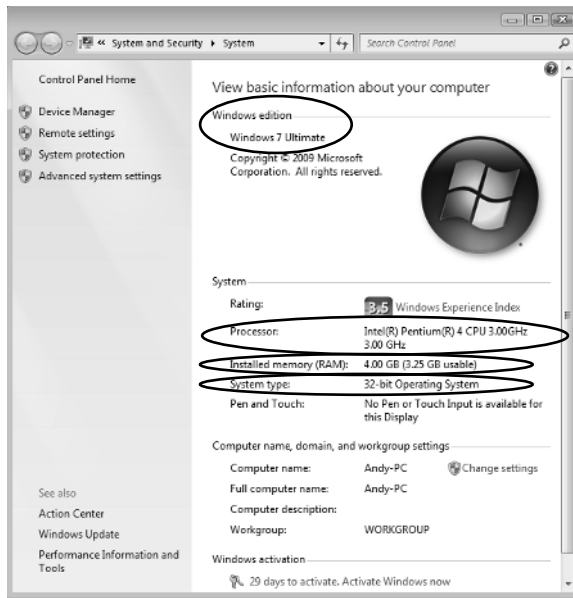
Figure 1-8: Find out what edition of Windows your computer runs, as well as other computer properties you need to know before upgrading.

Identifying parts inside your computer

The big three — Windows version, CPU, and RAM — usually have the most influence on which software and new parts your computer can handle. But sometimes you need more detailed information — especially about your type of video card, for instance, or perhaps your DVD drive's make and model.

Windows burps up this type of information when you prod further, as described below.

1. **Click the Start menu, right-click the Computer icon, and choose Properties. (Refer to Figure 1-4.)**

   Choosing Properties unleashes the System Properties dialog box.

2. **Click the words Device Manager in the task pane along the window's left. (Refer to Figure 1-8.)**

   The Device Manager dialog box jumps to the screen, displaying your computer's parts. When first opened, the Device Manager lists the parts found in a typical computer: the display adapter, for example, monitor, keyboard, and disk drives. The next step shows how to reveal the exact brand and model of those parts living in your computer.

   In Windows XP, fetch the Device Manager by clicking the Hardware tab, and clicking the Device Manager button.

3. **To see the make and model of a specific part, click the little triangle to the left of its name.**

For example, to see what type of video card sits inside your computer, click the tiny icon next to Display Adapters — the Windows term for a computer's video circuitry. As you can see in Figure 1-9, the name of your video card's model and manufacturer appear, invaluable information when the part stops working. Armed with that information, for example, you can search for updated *drivers* — translators between Windows and the part.

To see even *more* information about that part, double-click its name, and a window appears. Click that window's Driver tab to see the manufacturer, date, and version number of the currently installed driver — essential information when you're troubleshooting a part's driver.

When a particular part stops working, look for its make and model in the Device Manager. Then head to the manufacturer's Web site and download that part's latest driver, a chore covered in Chapter 17.
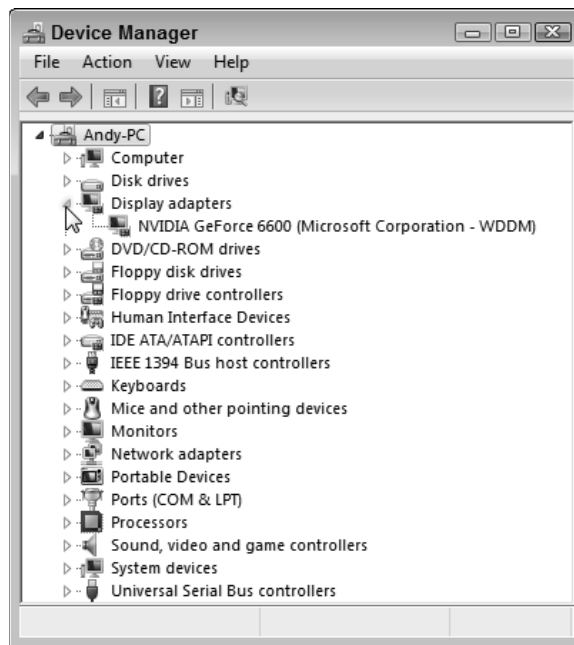

Figure 1-9: The Device Manager can tell you all the details you need to know about the parts in your computer.