

Optimizing a Sluggish System

4

This Chapter Is for You If...

- ☐ Your computer is much slower with Vista than it was with XP.
- ☐ Windows flicker and stutter.
- ☐ Applications take a long time to open.
- ☐ You loaded Vista on a machine you bought in 2005 or before.
- ☐ You want to learn some really cool optimization tricks.

What You'll Learn

In this chapter, I'll show you:

- What Microsoft's bogus Vista specifications are
- What Vista hardware specifications really are
- How to upgrade hardware so your system runs Vista better
- How to use your USB key to boost Vista performance
- How to turn off unnecessary Vista visual components and claim back some performance
- How to clean up your machine
- How to tweak the defragmenter
- How to track down huge files that are eating hard drive space
- How to track your system's performance over time

Super-Charge Vista! Or at Least Give It a Prod

Your Vista computer is probably one of three types. Let's look at each one:

- You went out and bought a brand-spanking new Vista-loaded machine. Or you bought a machine that was Vista-ready before Vista came out, and then you upgraded when Vista arrived. If this is your situation—great! This chapter will help you to optimize it so it is zippy like a 10 year old at Disneyland.
- You could also be one of the many legions of Windows devotees who upgraded their computer from XP. Unless you have a relatively new operating system with lots of RAM, a recent multicore processor, and a separate video card with plenty of video RAM, you're not likely enjoying as good a performance with Vista as you had with XP. Still, the experience is probably OK and maybe even good.
- You could also have upgraded to Vista using older hardware that ran XP or an older version of Windows and are frustrated, because it feels like you are working with the slowest computer on the planet.

No matter where you are at with your computer, I can help you tweak Vista to perform better.

For some, I'll be able to help you turbo-charge the machine. For others, the tricks will improve system performance. And for those who don't see much improvement, I can at least tell you why your Vista-powered computer performs like a pork sandwich.

Hardware Requirements: The Basics

Vista is a demanding operating system that needs a bit of beefcake under the hood. So if your system is more Paris Hilton than Rosie O'Donnell, you'll have to give it a bit more oomph with a couple of upgrades. Even Vista's minimum hardware specifications (as defined by Microsoft) are somewhat ambitious.

First, let's look at what Microsoft recommends; then I'll tell you what hardware you really need to have a good Vista experience.

Microsoft's Minimum Vista Specifications

Microsoft calls its minimum Vista specifications “Vista capable.” The CPU on a Vista-capable computer has been around since 2000, but the minimum graphics processor that will work on a Vista-capable computer only came about in 2002. Here are the specs:

- A single-core 800MHz processor or better, which means a high-end Pentium III
- 512MB of system memory
- A graphics processor that is DirectX 9-capable, likely one built since late 2002 or early 2003

Frankly, this setup is a cupcake. If this is what you plan to run Vista on, get ready to spend a lot of time in the AngryDome. It'll drive you crazy. To have even a passable experience with Vista, you're going to need a lot more horsepower under the hood.

Microsoft's Recommended Specifications

Microsoft has dubbed its recommended hardware specifications for Vista as “Vista Premium.” These are the minimums that Microsoft says you'll need for a reasonable experience with Vista:

- 1GHz 32-bit or 64-bit processor
- 1GB of RAM
- Support for DirectX 9 graphics with a WDDM driver and a minimum of 128MB of graphics memory (VRAM)
- 40GB of hard drive capacity, with 15GB free space
- DVD-ROM drive
- Audio output capability
- Internet access capability

What that means is a computer that was bought in 2003 or later. Anyone who follows this hardware recommendation is going to be miserable with the results. It's way too bullish, and Microsoft should be ashamed of suggesting such paltry specs.



DirectX is a bunch of Microsoft programming that handles multimedia tasks on a computer. Hardware that works with it has to be capable of using the tools in it to create graphics and audio on a computer. Windows XP shipped with DirectX version 8.1 and later was upgraded to DirectX 9. Vista shipped with DirectX 10. If you are a computer gamer, all of this DirectX nonsense makes sense to you. If you're not, just know that you need DirectX 9 or 10 compatible hardware to make Vista work.

Windows Upgrade “Marketer”

I am going to reluctantly put a link here to the Windows Upgrade Advisor, which is a utility you can download and run on your computer to see whether it can run one of the various versions of Vista.

I think its tolerances are really exaggerated, and it's not an honest take on whether Vista will run well on your system. It's more of a Microsoft marketing tool than a legitimate applet.

So, consider any recommendation it makes with a bit of jaded skepticism. You can download it from here: <http://www.microsoft.com/windows/products/windowsvista/buyorupgrade/upgradeadvisor.mspx>.

Andy's “Don't Believe the Hype” Vista Specs

I've run Vista on a variety of older machines, and I have to say if you have a computer that you bought before 2005, you're in for a disappointment, especially if the computer was of a budget variety. And if you get the OS to load on something older, it may run fine now, but as you start loading it with Vista-designed applications, it's going to annoy the cheddar out of you.

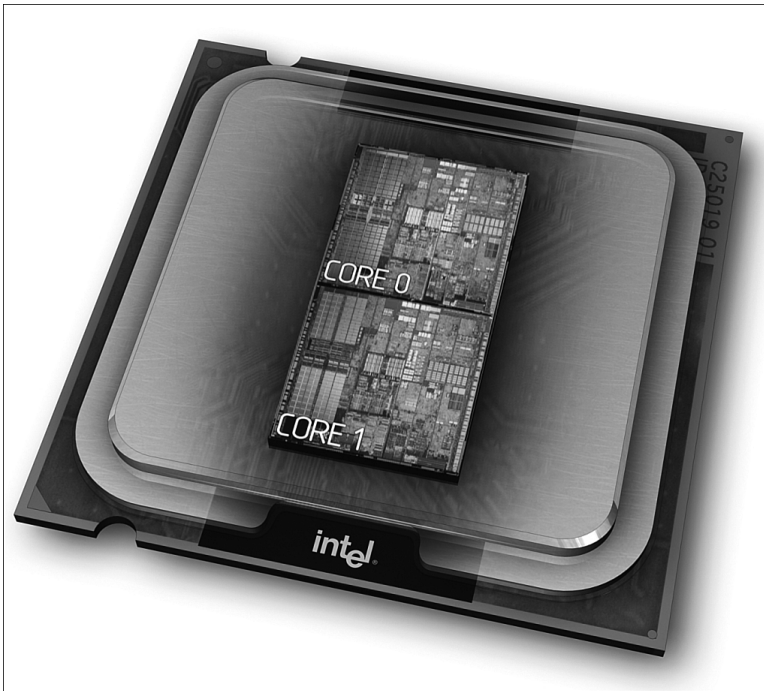
For those who want a good experience with Vista and want a couple of years of performance out of the machine before new applications drag it to its knees, I'd recommend at minimum a machine that runs a multicore processor.

That's either Pentium D, Pentium D Extreme, Core 2 Duo (see Figure 4.2), Core 2 Quad, or AMD multicore equivalent.

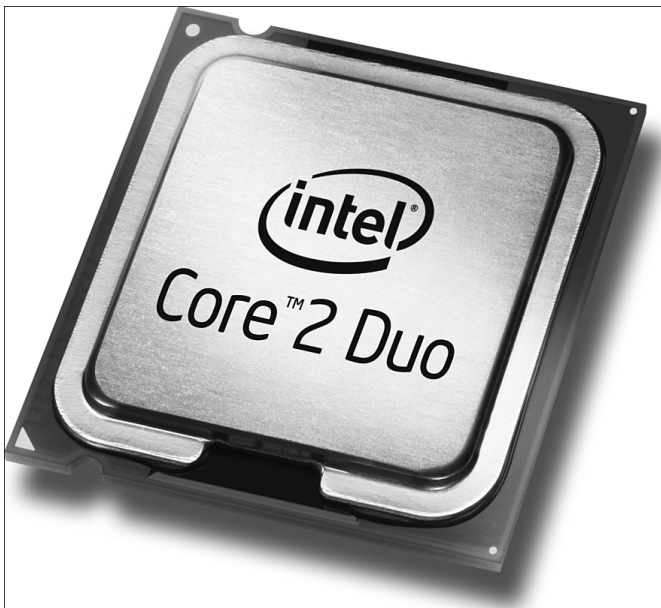
That's the simplest advice I can give you. Most machines of that caliber will have the requisite RAM and video technology to do Vista justice.

**tip**

Multicore processors are a fairly recent innovation from microprocessor manufacturers that put more than two “brains” (see Figure 4.1) on one chip. Dual-core processors have two. Quad-core processors have four.

**FIGURE 4.1**

This Pentium D was the first-generation multicore processor for the consumer. (Photo courtesy of Intel.)

**FIGURE 4.2**

The Core 2 Duo processor from Intel is a processor with two “brains,” which will run Vista well. (Photo courtesy of Intel.)

caution

If your computer doesn't have my minimum specifications, I will show you shortly how to upgrade some components to improve the performance; however, if your computer is borderline or not particularly close to my suggested specs, consider buying a new machine with Vista preloaded.

FIGURE 4.3

The Core 2 Extreme processor from Intel is a quad-core processor that would do Vista justice. (Photo courtesy of Intel.)

tip

You can run Vista on a single-core 2GHz processor or better (please let it be better). And you will have an OK experience, but you're short-changing yourself on a good Vista experience. Into the future, a single-core machine is going to be a bit of a lump, especially as you start adding new Vista-ready applications. To my mind, keep XP on a fast single-core machine and hang it off your home network as a handy second computer.

To go deeper, here are detailed hardware specifications for what I call "Vista Reasonable":

- A multicore processor, such as the Pentium D and Core 2 Duo or equivalents. As I write this, the quad-core CPUs are starting to hit the consumer marketplace, so one of those will do fine as well (see Figure 4.3).
- 1GB of RAM, but I recommend 2GB.
- DirectX 9-capable video card that offers Vista drivers, with a minimum of 128MB of VRAM. I urge you to do better with 256MB or 512MB of video RAM.
- 80GB hard drive or better.



Hardware Upgrades for Vista Bliss

Later in this chapter, I'll show you some software tweaks that will help you get the most performance out of your system. But the best thing you can do to give Vista a boost is to upgrade one or more of the hardware components, if it is behaving in a sluglike manner.

As we go into this section, it's a good idea to take an inventory of your system components. I showed you how to do this in Chapter 2, "Basic Vista Troubleshooting," but I'll review that as we go. It's helpful, however, if you gather the following information.

Photocopy and fill out Table 4.1 as needed.

TABLE 4.1
YOUR SYSTEM SPECS

System Components	Your System
Processor make & model:	
Amount of RAM:	
Video card make & model:	
Amount of video RAM:	
Hard drive size:	
Hard drive space available:	
Windows Experience Index:	



caution

If you are a laptop owner, you will definitely want to run Vista on a dual-core processor with 1GB of RAM and a decent mobile video adapter if you want mobile Vista joy.

More Memory: Cheap, Easy, and Quick

One of the quickest and easiest hardware upgrades you can do is to add more RAM or system memory. These are memory chips that slot inside your computer. This is easy to do, affordable, and the most cost-effective hardware upgrade you can do yourself.

Vista requires a minimum of 512 megabytes of memory (see Figure 4.4). Anything less will produce disappointing results.

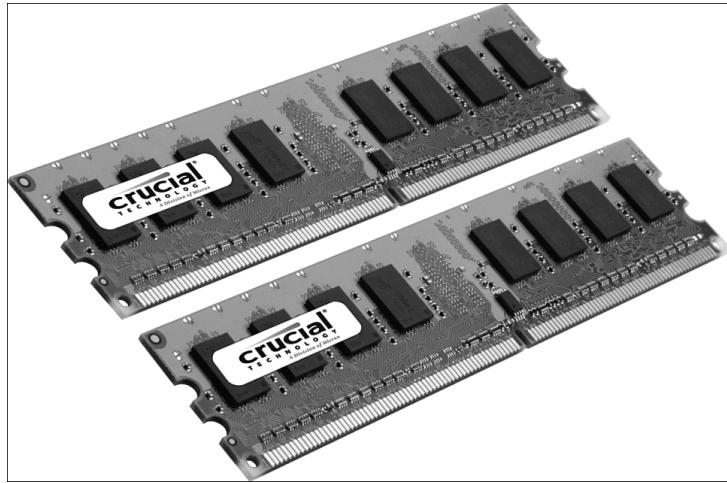
As I said earlier, 1GB of RAM is preferable, and an upgrade to 2GB is recommended.

Here's how to find out how much memory is in your Vista machine:

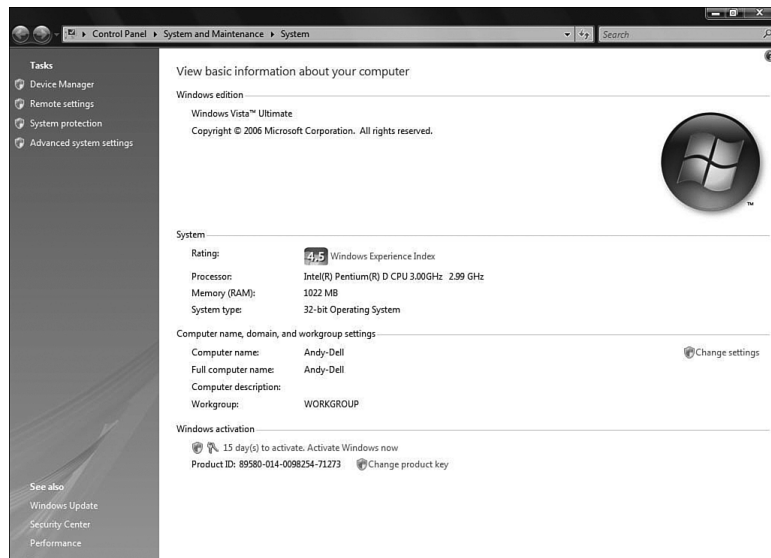
1. Click on the Windows button menu.
2. Right-click on Computer in the right-hand bar and choose Properties.
3. Look under the section labeled System for the Memory (RAM) listing (see Figure 4.5).

FIGURE 4.4

Vista needs a minimum of 512MB of RAM, but it's better off with 1- or 2GB. Note that depending on your type of RAM, you might have one, two, or more memory modules, such as those shown here.

**FIGURE 4.5**

The System applet shows how much physical RAM is installed in the computer.

**tip**

If you bought your computer system from a major manufacturer (Dell, HP, and so on) and it has a specific model number, you should be able to determine the maximum amount of RAM your computer will be able to hold by going to the company's website and looking up the specification sheet for your particular model.

It may be tricky to find out your system's exact memory chip configuration (meaning whether memory modules can be installed singly or in pairs, as well as how many memory slots you have) and maximum allowable memory. First, try the website Crucial.com. It will show you what RAM you need specific to your brand, make, and model. Use the Crucial memory wizard to get this information. Kingston.com offers a similar feature.

I also outline in detail how to upgrade your RAM on my website at <http://www.cyberwalker.com/article/41>.

If you have a custom-built machine, you have two choices:

1. Try Crucial's system scanner (see Figure 4.6) at <http://www.crucial.com/systemscanner/>, which can figure it out for you on most machines.
2. Or, use the free Belarc Advisor. More info on that can be found on p. 45 in Chapter 2 (in the "From Despair to Freeware" section).



tip

Be sure to use the Internet Explorer browser to run the Crucial System Scanner, as Crucial uses an ActiveX control to do the scan. Mozilla Firefox won't work with it.

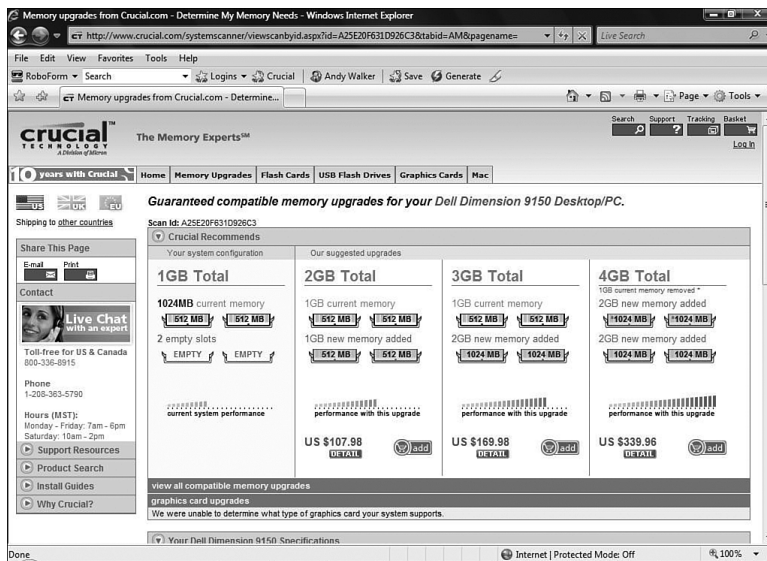


FIGURE 4.6

The Crucial System Scanner shows that my Dell computer has 2x512GB of RAM installed in two of the four RAM slots in my computer.

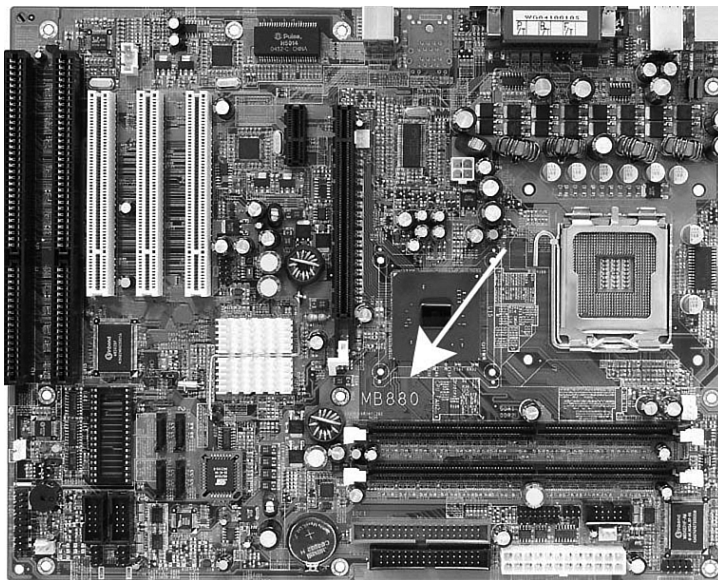
The other way to do it, is to crack open the case to figure it out. Here's how:

1. Make sure your machine is turned off and unplugged.
2. Remove the side panel.
3. Be sure to touch the PC's metal frame to discharge any static electricity from your body before proceeding. You also might want to consider wearing an antistatic wrist strap, which is available at most any store that sells PC components. It'll add to your geek cred too!
4. When you have it open, look for the motherboard, which is the large circuit board that everything is plugged into.

5. The name of the motherboard manufacturer (Asus, Gigabyte, Intel, MSI, and so on) and the model number of the motherboard are usually stenciled onto the motherboard (see Figure 4.7) in a fairly obvious location, though you might need to gently nudge some cables aside to see it. Make a note of it. Then close up the system and plug in the system again.
6. Visit the website of the motherboard manufacturer, and see the maximum RAM configuration of your computer by looking it up in the spec sheet for that particular motherboard model.

FIGURE 4.7

This IBase motherboard has its model number (MB880) stenciled on it.



If your system is older and has RAM slots that are full, you may have to remove them and replace them with larger memory modules to upgrade your memory. If this is the case, you might consider selling the old RAM on eBay.

Order extra memory and install it when it arrives. This requires you to open up the system again to slot the new memory modules into the open RAM slots. No further configuration is necessary. The system will auto-recognize extra memory when you boot the system.

Bigger, Better Video Card

One surprising quirk about Windows Vista is its increased demands on the video adapter. That's because the new Aero interface offers a dynamic desktop, thumbnail and taskbar previews, and glasslike windows. This puts big demands on the graphics processor or GPU.

To run Vista, your graphics adapter must at a minimum be compatible with Microsoft's DirectX 9 technology, which is a set of Windows tools and components inside the operating system that drive what you see on the screen. That said, Vista ships with DirectX 10, which runs on DX9-compatible video adapters today. In the future, new generations of video cards will be able to harness new 3D features employed by DX10.

What You'll Need

Hardware-wise, if you want to run Vista Ultimate, you'll need a video card that has at least 128 megabytes of video RAM or VRAM (see Figure 4.8). I would argue that a machine with a video card with a minimum of 256MB of VRAM is really what you should be aiming for.

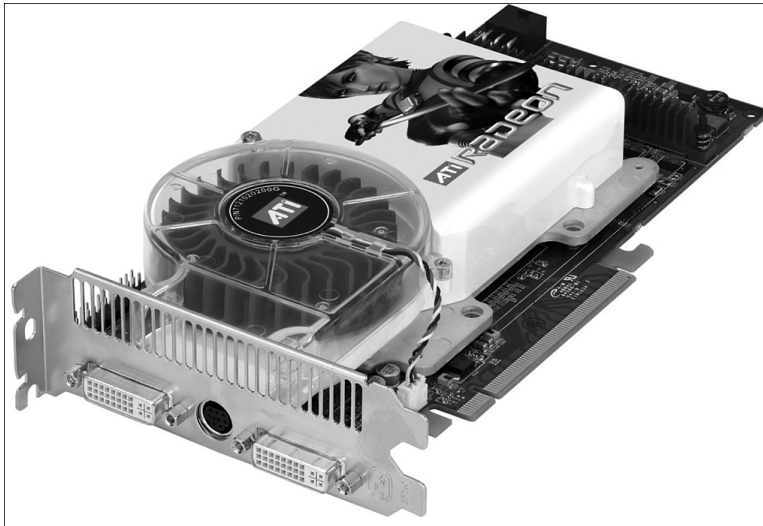


FIGURE 4.8

With Vista, you'll need a video card with 128MB of VRAM or more, like this ATI Radeon X1900. (Photo courtesy of ATI.)

In my Dell desktop machine, I run an nVidia GeForce 6800 card with 512MB of VRAM, and on the release version of Vista Ultimate, I've so far had no problem with what I see on display.

If your current system has a graphics adapter that's integrated directly onto the motherboard, your quickest way to get better graphics performance is to add a separate graphics card into your system.



tip

You can tell at a glance whether your computer uses integrated graphics by looking at where the monitor connects to the computer. If the connector is bunched in with the audio, USB, and other connectors, it's integrated. If it's in one of the perpendicular slots, it's a separate adapter.

Not all machines will have an expansion slot. An old 2.8GHz budget machine I bought from Dell a year or so ago doesn't have a graphics card expansion slot, so that machine is better used with Windows XP.

Disable On-board Video

If you are going to add a video card to a computer system that previously used an on-board video adapter (a.k.a. one built into the motherboard), you'll need to turn off the built-in video adapter. This is achieved in one of two ways:

- You can disable it in the BIOS.
- You'll have to physically adjust a jumper (a set of pins with a movable connector) on the motherboard to turn it off.

Check with your computer maker or your motherboard manual to figure out how to do this. It's not hard, just a pain in the rump.

If you get stuck, post to the forums at <http://www.cyberwalker.com/forums/> and request help from one of my helper geeks.

Determining DirectX on XP

You can find out what version of DirectX your XP (or older) system uses by clicking Start, Run, and then typing **dxdiag** (see Figure 4.9) and clicking OK.

If a dialog box pops up, asking whether it's OK to run the program, click Yes. When the DirectX diagnostic console pops up, look for the last item on the System Information list on the System tab. It will report what version of DirectX you're running.

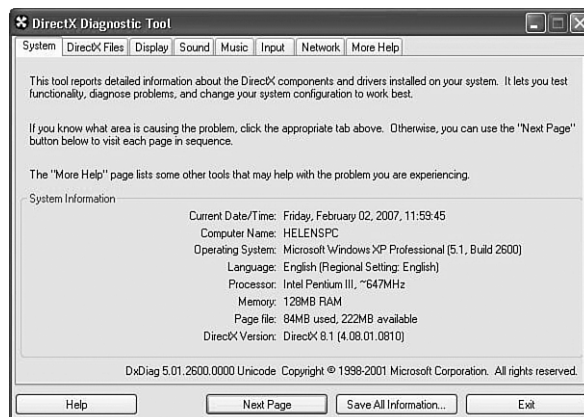


note

The dxdiag utility is available in Windows 98, Windows Millennium, Windows 2000, and Microsoft Windows XP Professional.

FIGURE 4.9

Use the dxdiag utility to figure out what version of DirectX your old system is running. This Pentium III computer uses DX8.1.



On the Display tab, you'll see info about your video adapter, including the make, model, and approximate video memory (see Figure 4.10).

It will list N/A if your computer uses graphics that are integrated onto the motherboard, because integrated graphics adapters don't have their own memory; they share the system RAM with the CPU.

Click through the other tabs (or click Next Page repeatedly) to get more information on your system, including audio specs.



note

The video memory may not report precisely. My 512MB nVidia card reports 504MB.

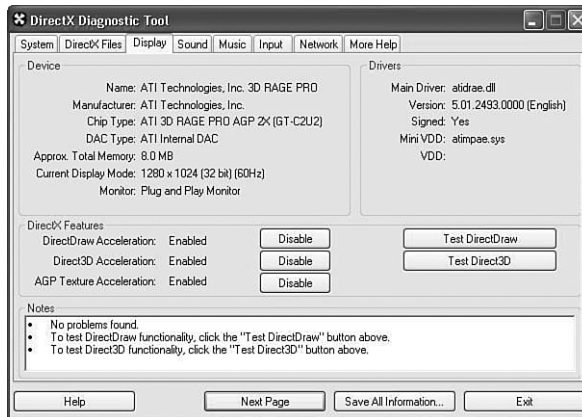


FIGURE 4.10

This Pentium III computer has a paltry 8MB of VRAM and is not suitable for any flavor of Vista.

If you want to run the Aero interface in Vista, you may need to upgrade your video card. So check to see whether there's a card slot inside your system that's available for an upgrade card or that your existing card already occupies.

It's worth remembering that a higher-end graphics card will consume more power. If your computer's power supply unit is already stretched to the limit, your system performance may become unreliable as the power requirements peak inside the computer. If you've upgraded or added other components in the machine since you bought it—like a second hard drive or DVD drive—and you haven't upgraded from the stock power supply that came with the machine, you might run into power problems if you upgrade to a Vista-compatible graphics card.

If this is the case, you may either steel yourself to install a larger power supply, or instead you may now be seeing the merits of saving for a new Vista-configured machine.

Upgrading Your Graphics Card: The Nitty Gritty

If you go ahead with a video card upgrade, you'll need to match the card with your motherboard. The standard graphics card interface over the last number of years was AGP (short for Accelerated Graphics Port), but newer machines use a new slot called PCI Express (PCI-X).

It's important to make sure not only that you get a card with the right interface, but also that your motherboard is compatible with the card that you get. You'll often see a multiplier rating beside the AGP interface, such as "AGP 8x." Some of the newer, faster graphics cards may not be compatible with older motherboards.

Check the specifications of your motherboard to see what type of graphics card it can handle. A system or motherboard manual or manufacturer's website should be able to tell you. Also investigate in the system specs what the maximum speed of that card can be.

Installing a Faster CPU: Not an Easy Upgrade Option

Depending on the age of your computer system, you may be tempted to upgrade your computer's processor, also called a CPU. Be forewarned: It can be a much more involved process than a simple RAM upgrade.

A newer, faster CPU will have to be compatible with the motherboard, or you'll have to upgrade the motherboard too. And if you upgrade the motherboard, it will have to be compatible with the RAM, power supply, and graphics card, or you will have to upgrade those, too.

Unless you consider yourself a super geek, I don't recommend this gruesome upgrade process unless you enjoy the occasional pine cone up the nose.

Have I convinced you to not bother with this yet?

If you're running a machine that's more than a year or two old, you'll find it more cost-efficient to buy a new machine that's already optimized for Windows Vista, rather than spending a ton of money and effort to upgrade everything.

That said, just for fun, you might want to find out what CPU your system has on board:

1. Click on the Windows button.
2. Type **System** in the Search box and click it when it appears.
3. Look under the section labeled System for the Processor listing (see Figure 4.11).

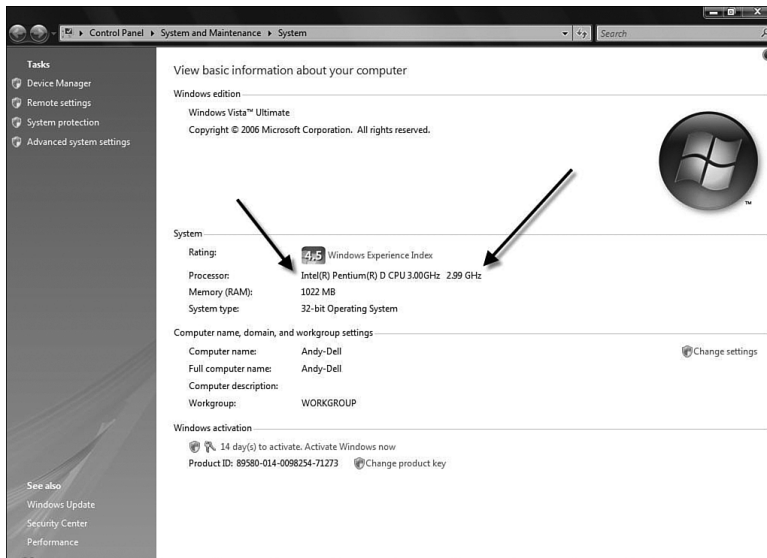


FIGURE 4.11

Find the make, model, and clock speed of the CPU installed in your computer in the System applet.



note

It's worth noting that this screen will often list more than one processor speed—the first will be the actual speed of the processor, and the second will be the speed that processor is currently running at.

Andy's Recommended Upgrade Plan

After all that upgrade chit chat, let me summarize for you what you might consider doing if you have a bit of money and are willing to be more ambitious than usual, if you're not a system tinkerer.

For most people who consider themselves intermediate computer users, but not advanced geeks, I recommend the following upgrades, if needed:

- **RAM**—Definitely upgrade to 1GB of RAM and go to 2GB if you have a bit of extra cash. Go to 3 or 4GB if you play games, edit video, or want the 4GB geek bragging rights.
- **GPU**—If you bought a midlevel or premium system in the last two years, and it has a separate video card slot (or you can

swap out the video card that's there), invest in a newer video card with 256MB or 512MB VRAM.

- **CPU**—Skip a CPU upgrade unless you have a hardcore geek around. The headaches and resulting performance boost aren't likely to pay off.

Boost Vista with Your USB Key

Vista has a fun and useful new feature called ReadyBoost, which is quite ingenious. It's used to put your USB memory key to work to add extra virtual memory to the system, giving the machine more resources to work with.

Windows traditionally uses empty hard drive space to create an extra work area when main memory runs out. However, now there's a new option. Use your USB key (see Figure 4.12)!

FIGURE 4.12

Use your USB flash drive, like this SanDisk Cruzer Titanium key, to give Vista some zip with ReadyBoost.



Although the flash memory in one of these little portable drives is not as fast as standard RAM or a hard drive, Vista can use it to read and write small pieces of data. That said, not all USB keys will work as ReadyBoost drives. There's always a catch, isn't there?

Each key you use as a ReadyBoost drive has to pass a series of speed and capacity tests to qualify (see the sidebar “Is My USB Drive Ready for ReadyBoost?” for details on this).

Here’s how to set up a USB flash memory drive as a ReadyBoost drive:

1. Plug your USB flash memory drive into a USB 2.0 port.
2. When Vista detects the drive, the Autoplay applet will show a list of options. Choose Speed Up My System Using Windows ReadyBoost (see Figure 4.13).
3. Vista will perform a bunch of tests on the drive to see whether it is suitable.
4. If it passes, the Autoplay applet will display the ReadyBoost tab. In it, adjust the slider bar to the amount of memory on the flash drive you would like to use for ReadyBoost.
5. If the ReadyBoost option doesn’t appear, the drive does not meet minimum specifications needed to work as a ReadyBoost drive.

**tip**

USB ports are USB 2.0 compliant these days. The ports on your computer will be too if the computer was built since 2005.

**tip**

Microsoft recommends using a flash drive that’s anywhere between one and 2.5 times the amount of RAM currently in your system—beyond that, you won’t see much additional benefit.



FIGURE 4.13

When you plug in your USB key, the Autoplay applet gives you the option to use it as a ReadyBoost drive.

Is My USB Drive Ready for ReadyBoost?

When Vista tests a USB drive to see whether it's suitable as a ReadyBoost device, it looks at several factors. To use a ReadyBoost device, your USB drive has to pass all of them. They are as follows:

- The drive must have a capacity of at least 256MB, of which a minimum of 230MB will be used by Vista for ReadyBoost tasks. The maximum size of flash drive you can use is 4 gigabytes.
- Vista must also be able to read 4K of data at 2.5MB/sec randomly across the drive.
- Vista must be able to write data at 1.75MB/sec for a 512KB chunk of data.

So, how can you tell whether your drive meets the specification? The easiest way is to plug it in. The manufacturers of USB memory drives don't print their specifications clearly on the packaging. That said, premium USB drives from companies such as Lexar or SanDisk will work as ReadyBoost drives.

Expect companies that make these drives to bill them as ReadyBoost ready on the packaging.

You can learn more about ReadyBoost at the Ready Boost Q&A at <http://blogs.msdn.com/tomarcher/archive/2006/06/02/615199.aspx>, and you can look up your USB key at <http://www.grantgibson.co.uk/misc/readyboost/>.

Alternative Ways to Enable ReadyBoost

If Autoplay is disabled on your machine or the USB drive is already plugged in, enable ReadyBoost as follows:

1. Click the Windows button, and then click Computer.
2. Locate the USB flash drive you want to use for ReadyBoost and right-click on it.
3. Choose the Properties option.
4. Click on the ReadyBoost tab; then click the Use This Device radio button.

You can remove the USB drive at any point without causing harm to the system. Of course, after you take the drive out, the computer will slow down to its original performance level.



For the security-conscious, it's worth noting that Vista saves all cache data in encrypted form, so if someone gets his hands on a USB flash memory drive that's been used for ReadyBoost, there will be no data on the drive that he can use.

ReadyBoost Is a Ready Bust on My USB Key

If your USB drive failed the ReadyBoost tests, you can find out how fast it is by digging into the Event Viewer:

1. Click the Windows button.
2. Type **Event Viewer** in the Search box on the Start menu.
3. Click the Event Viewer when it appears in the menu to open it.
4. Dig into the Event Viewer by clicking the arrow next to each of the following:
Applications and Services Logs > Microsoft > Windows > ReadyBoost.
5. Click on Operational.
6. In the center panel, click through each of the Information items until you see an event listing that references your USB drive (it should be the top one if it's the most recent event) and why it succeeded (see Figure 4.14) or failed. Size and speed warning information is also presented, although if it fails the size test, it won't do a speed check so that data is not available.

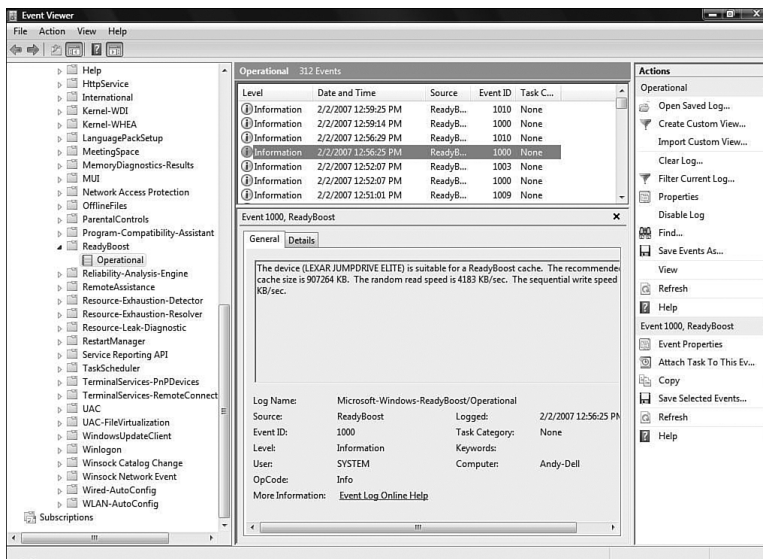


FIGURE 4.14

The Event Viewer shows that the Lexar drive plugged into my computer is suitable for ReadyBoost. It also displays read and write speeds.

Tweak Your OS

If your hardware is up to spec or as close as you can get it and you want to tweak Vista a bit more, there are some software tweaks you can do to improve your system's performance dramatically.

In fact, if your hardware is somewhat marginal, these tweaks can keep you from walking into head-on traffic in despair. (Though offering yourself because of a piece of software really isn't worth it. If it gets that bad, buy a Mac.)

I can't promise big things here, but the advice should help improve the system a little. Let's get you off the asphalt.

Adjust Your Performance Options

If your system is a bit poky, first turn off a few options you don't need to use in Vista:

1. Click the Windows button, and type **System** in the Start menu search.
2. Click the Advanced System Settings link in the left-hand pane, and click Continue if User Access Control pops up.
3. On the Advanced tab, click Settings under the Performance area (see Figure 4.15).

FIGURE 4.15

Tweak the settings in the System Properties under the Advanced tab.



4. On the Visual Effects tab, click Adjust for Best Performance to automatically uncheck all of the options that use up system resources (see Figure 4.16).
5. This will turn off all the Aero features, and Vista will revert to what looks like an unflattering version of XP. All the yummy new graphics features will be toggled off (see Figure 4.17).

Now this bed-head version of Vista may not be appealing to you, no matter how much performance you gain back. So here's a compromise.

Leave unchecked all the pretty shadow and translucent features. These cosmetic features are just lipstick on a porcupine.

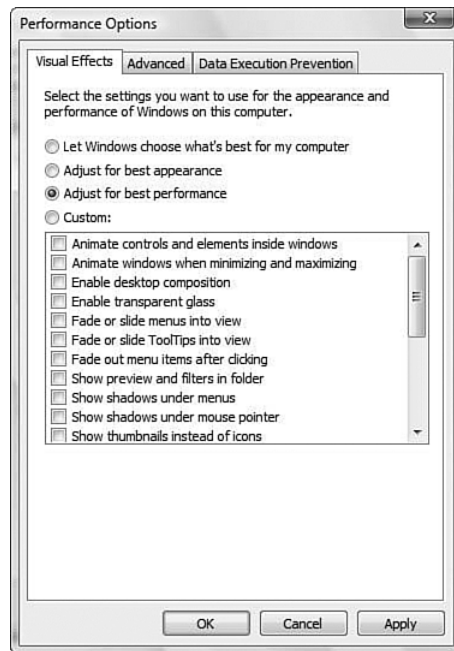


FIGURE 4.16

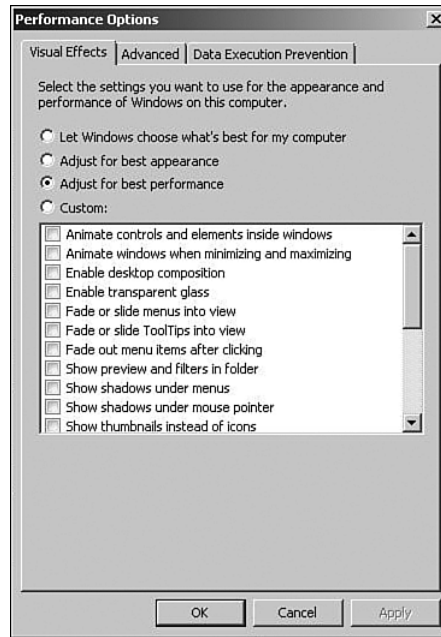
If you click Adjust for Best Performance, all the resource-intensive Visual Effects settings will be switched off.

Then, turn back on the following features that'll improve the look of Vista but give it a break on performance:

- Show Thumbnails Instead of Icons
- Smooth Edges of Screen Fonts
- Smooth Scroll List Boxes
- Use Visual Styles on Windows and Buttons

FIGURE 4.17

Yuck! If you turn off all Visual Effects to get back some performance, Vista transforms from a beauty queen into her ugly sister.



Toy with these to your taste. I think you'll find that they'll give you the Vista feel you want, but with a nice performance boost.

Optimize Your Startup

Many programs that you install on your system will install a helper application that runs unseen in the background. When you run the program, the helper app springs into action to make sure the program loads faster than it would if you were starting it from scratch. It's like having dozens of butlers hanging around, ready to cater to your every whim. But too many will clutter the living room, making it hard to watch TV.

Same problem with helper programs. They run in the background, ready to help, but they also suck up memory, whether you use them or not. As a consequence, they'll slow down your system.

Vista has a new utility called Software Explorer built into the antispyware program Windows Defender. It gives you a quick and simple way to edit your startup items. You can get to the utility as follows:

1. Click the Windows button, and then type **Windows Defender** in the search area.
2. Click Windows Defender when it appears in the Start menu.

3. Click on the Tools option across the top, and then click Software Explorer in the Tools area midway down the window (see Figure 4.18).

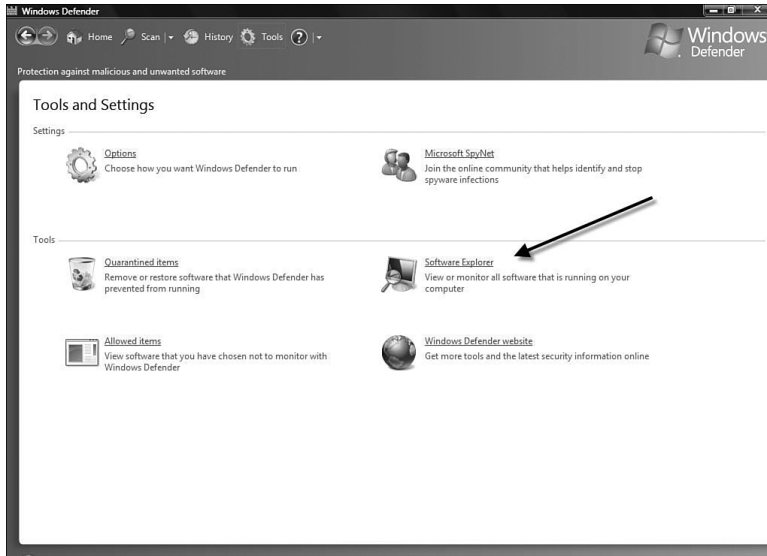


FIGURE 4.18

Software Explorer in Windows Defender helps manage programs that run at startup.

4. Software Explorer is split into two panes. In the left-hand pane, there will be a list of items that start automatically every time you start up Windows.
5. At the bottom of the window, be sure to click the Show For All Users button to see all the Startup items on the system; otherwise, some won't be removable. Click the UAC button to Continue.
6. To remove an item from the list, simply click to select it and then click the Disable or Remove button on the bottom right (see Figure 4.19).
7. If you're unsure of what each programs does, get more information by clicking on an item to select it and then read about it in the right-hand pane.

If you prefer the geek method of changing your startup items (my preference), use the Microsoft System Configuration utility (see Figure 4.20), which you can get to by clicking on the Windows button, and typing **msconfig** into the search window.

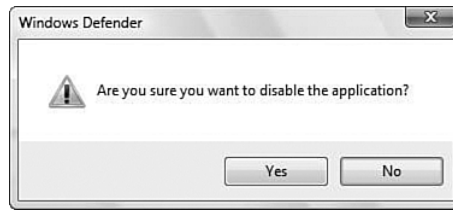


tip

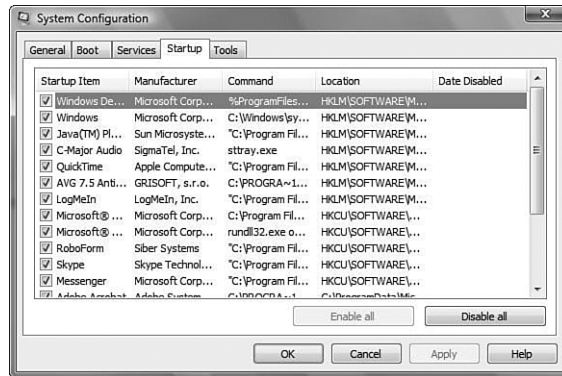
In Software Explorer, you can also manage programs in memory as well as other critical system components by selecting Currently Running Programs, Network Connected Programs, or Winsock Service Providers in the Category pull-down box.

FIGURE 4.19

Use Software Explorer to remove or disable startup items.

**FIGURE 4.20**

Geeks use msconfig—*a.k.a. the System Configuration applet*—to tweak the startup.



I detail how to use the Microsoft System Configuration utility in Chapter 3, “Startup and Shutdown Issues.”

Boost Your System with Basic Maintenance

System performance also suffers when a computer runs low on hard drive space. It’s kind of like a garage full of bikes, mowers, tools, stacked boxes, and holiday decorations. When there is space to move around, it can be a good place to work. When it gets cluttered, it’s harder to get things done because you have to navigate around loads of junk.

A computer reads and writes information to its hard drive all the time, so when the drive gets close to being full, it has a harder time finding empty space, and that makes it less efficient.

If this is the case with your computer, take some time to clean out data and programs you don’t need any more, especially if you upgraded to Vista from an earlier version of Windows.

You'll be surprised how much of a system boost you'll get from a roomy hard drive.

What follows are some tips on how to clean your computer's virtual garage.

Empty Your Recycle Bin

If you delete items regularly but don't empty the Recycle Bin regularly, a lot of digital trash can accumulate in the bin. Get rid of it:

1. Right-click on the Recycle Bin.
2. Choose the Empty Recycle Bin option (see Figure 4.21), and it will be gone. Simple, but that's not all for some....



FIGURE 4.21

You know to empty your Recycle Bin regularly, don't you?

3. If you use a utility that offers file deletion protection, such as Norton SystemWorks (see Figure 4.22), you should also right-click the Recycle Bin and choose the option to delete those protected files if you are sure you don't need to recover any of them.



You might instead open the program that offers file deletion protection and delete the files within the program.

Remove Unused Programs

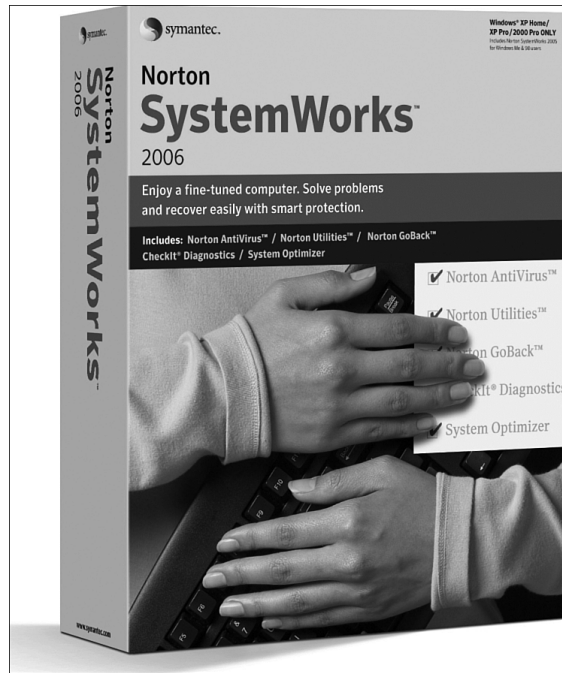
Everyone is guilty of downloading fun, yet perhaps inane, programs—like *Laser Dolphin*—from the Web, installing them, and then never using them again.



You think I'm kidding, but *Laser Dolphin* is a real game (see Figure 4.23) in which you control a lethal Flipper that saves public officials. Get it (and then delete it when you are sated) at http://www.download3000.com/download_8493.html.

FIGURE 4.22

If you're emptying your Recycle Bin, be sure to clear protected files as well, if you run an application such as Norton SystemWorks.

**FIGURE 4.23**

Laser Dolphin in all its blowhole-burstin' glory.



If you feel like you'll need to fire lasers from a dolphin's head again at some point, keep it on the system. If you're past the *Laser Dolphin*

phase of your life, free up some space on your hard drive and uninstall it. Here's how to uninstall any program on the system:

1. Click the Windows button and type **Programs**.
2. Click Programs and Features in the list that appears in the Start menu.
3. To remove a program you no longer need on your system, click on it and click on the Uninstall/Change option in the ribbon above the list of programs (see Figure 4.24).
4. Click Continue when the User Access Control warning pops up, and then click Yes to continue uninstalling the program.

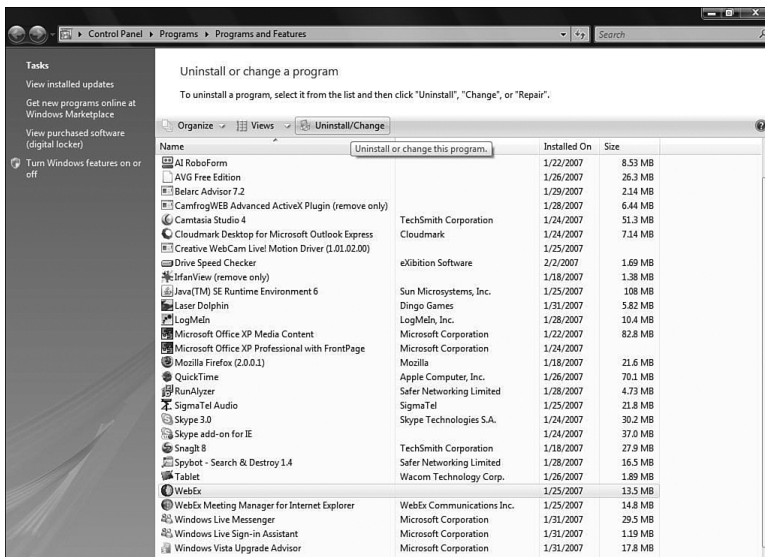


FIGURE 4.24

If you're done with Laser Dolphin, uninstall it!



If the program you want to delete won't uninstall (perhaps the uninstaller crapped out), you can manually remove it using the detailed step-by-step procedure I provide in Chapter 9, "Software Troubles," on p. **251** (in the section "Undo a Bad Software Install: The Hard Way").

Clean Up Your Temporary Files

From the Windows menu, type **cleanup** into the search bar. The Windows Disk Cleanup utility will launch. You will have the option of cleaning up your own files, or if you're an administrator, all users' files on your computer. If you have more than one hard drive attached to the system, you'll be able to choose which drive you want to clean up.

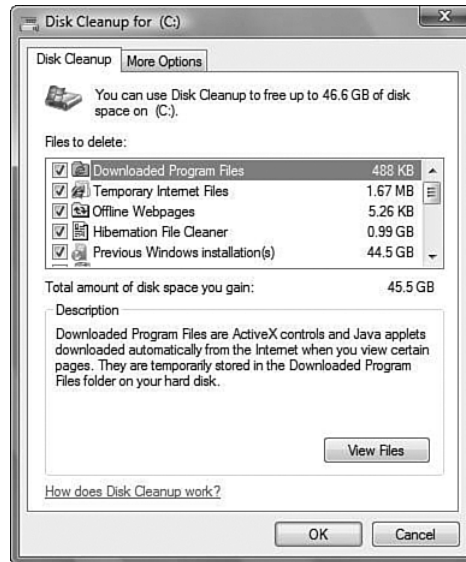
After you have chosen a drive by clicking on it, Vista will calculate how much space can be freed up. Then you'll have the option to empty the Recycle Bin and clean out your Internet Explorer cache files

(Temporary Internet Files), as well as downloaded program files, setup logs, and the like.

Note that if you have upgraded from XP, there will be an option to remove the previous operating system, which Vista backs up when it installs (see Figure 4.25).

FIGURE 4.25

Disk Cleanup helps you free up space on your hard drive, including your previous operating system's files.



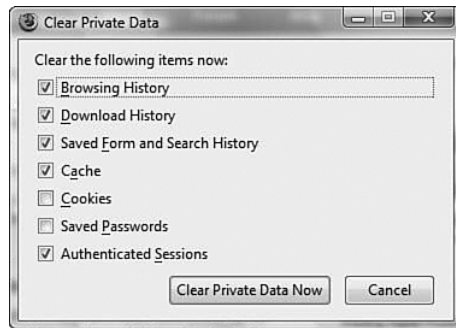
Clean Up Temporary Files in Alternate Browsers

If you use a different web browser, such as Firefox or Opera, it will save its temporary files in a different location to IE7. You can clear out those files by opening up that browser, opening up the program's Preferences menu, and navigating to the Cache option.

All popular browsers have buttons that allow you to clear your cache and browsing history in the same location where you can set the size of your temp file cache.

In the case of Firefox (my favorite), follow these steps:

1. Click the Tools menu in Firefox.
2. Click Clear Private Data (see Figure 4.26).
3. Select the type of data you want to clear using the check boxes.
4. Click Clear Private Data Now.

**FIGURE 4.26**

Be sure to clean up the cache on Mozilla Firefox and other alternate web browsers if you use them.

Delete Large Useless Files

If you're a video pack rat, you may have loads of huge video files sitting around on your hard drive, taking up space.

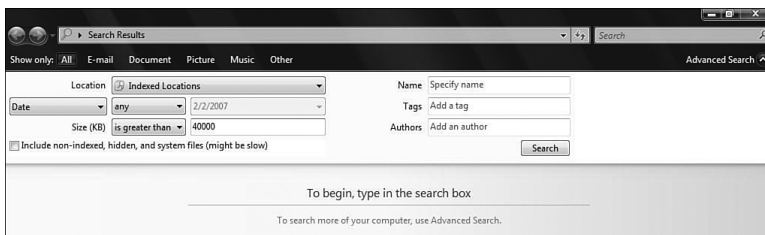
If you don't always save them in the same location, there's an easy way to track them down, so you can sort the good ones from the useless ones:

1. Click the Windows button, but instead of going to the search bar, look for the Search option on the right-hand side of the Start menu and click it.
2. Narrow the search by clicking on one of the options along the top, such as E-mail, Music, Document, and so on, or just leave it on All to seek all large files.
3. Beside the Size option, click on the pull-down menu and change Any to Is Greater Than, and enter a number in the box beside it. It measures in kilobytes, so if you're looking for a file that's at least 40 megabytes, type in **40000** (see Figure 4.27).
4. Delete the ones you don't want and be sure to empty your Recycle Bin afterwards.



tip

Hit Shift + Del to bypass the Recycle Bin when you delete files.

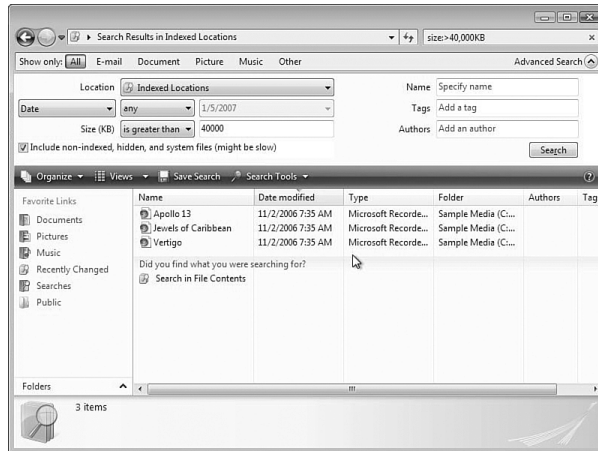
**FIGURE 4.27**

Toggle the file size in the Advanced Search options window to find really large files.

It's worth noting that when I searched for large files, I found three large sample video clips that came with Vista that were all more than 45 megabytes...that's about 150 megabytes of space recovered just by removing sample files that I didn't even know were there (see Figure 4.28).

FIGURE 4.28

These three sample video files that come with Vista take up 150MB of valuable hard disk drive space.



Virtual Memory

Does your hard drive grind ceaselessly when you run memory-intensive applications such as publishing software, photo applications, or video-editing programs?

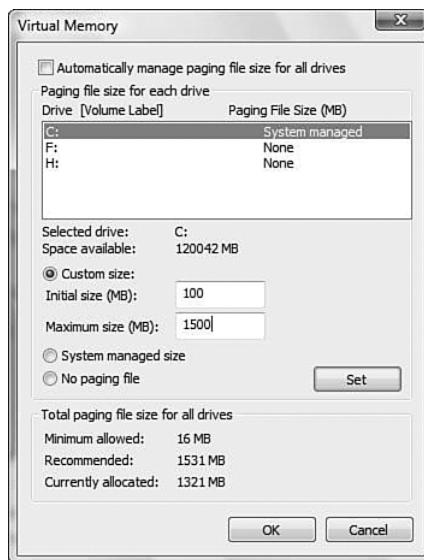
If so, your system is using virtual memory. That is to say, it allocates a part of the hard drive to double as RAM. This shouldn't become a staple of your system's resources. Sure, it's OK as a supplementary resource occasionally. However, overuse will create wear and tear on the hard drive, potentially shortening its life. Plus, using hard drive space for memory tasks is not efficient. RAM is much faster, and it is relatively cheap, so I urge you to consider buying more if your system can take more.

Of course, you might also want to first consider using ReadyBoost to speed up your system using a USB flash drive.

But if you still want to manually adjust your virtual memory, here's how:

1. Click the Windows button, type **System**, and click System when it appears in the Start menu.

2. Click the Advanced System Settings link in the left-hand pane, and click Continue when the User Access Control pops up.
3. On the Advanced tab, click Settings under the Performance section.
4. Click the Advanced tab and click Change under Virtual Memory.
5. To manually set the size of your virtual memory file, uncheck the box that says Automatically Manage Paging File Size for All Drives.
6. If you have multiple hard drives, choose the drive for which you want to set your virtual memory settings in the white box near the top.
7. Click the radio button beside Custom Size, and then enter an initial and maximum page file size in the boxes below it. These values are measured in megabytes (see Figure 4.29).

**FIGURE 4.29**

In the System applet, you can adjust virtual memory to a custom size.

**tip**

Personally, I leave virtual memory settings to Vista, which seems to do an adequate job of managing it automatically. Tweak it only if you're like my cat, Biff, who plunged off my loft railing down 10 feet onto the coffee table in the living room. He is fearless, but sometimes not so smart.

8. The conventional wisdom is you should set the Initial Size to 100MB and Maximum Size to 1.5 times the amount of RAM you have. Some say you can push the page file to a maximum of 4GB.
9. After you're done, be sure to specifically click Set to save your settings.



Learn more about defragmentation in my podcast Lab Rats at LabRats.tv. In episode 54, my co-host, Sean Carruthers, and I show you how defragmentation works using an eggplant. See <http://www.labrats.tv/episodes/ep54.html>.

Defrag Is Not a Panacea, but It Might Help

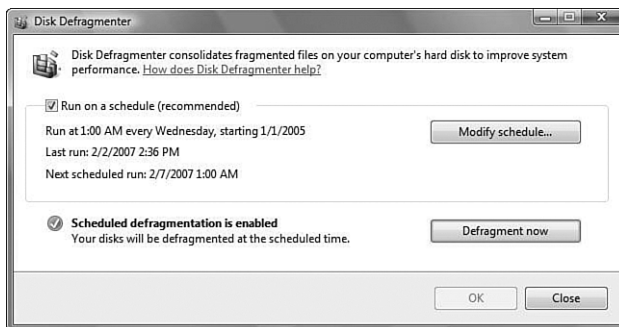
Although it might seem like all of your files are in one piece on your computer, many (if not most) of the files are split up into smaller chunks that are scattered across the hard drive. When they are needed, Vista reassembles them into complete files.

If there isn't enough free contiguous space on a hard drive for a particular file, Vista breaks it up and stores it in several empty spots.

This is called *file fragmentation*, and if the files on your computer are fragmented badly enough, overall performance will begin to suffer. Thankfully, there's a file defragmenter built right into Windows Vista called Disk Defragmenter (see Figure 4.30).

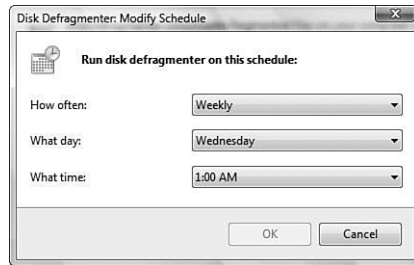
FIGURE 4.30

Vista can clean up file fragmentation with Disk Defragmenter.



By default, Vista is set to automatically defragment your files once a week, typically at a time when the machine isn't being used. If you shut down your computer at the end of the day, your files may never get defragmented automatically. So you might want to change the defragmentation schedule on your system, or to start the defragmentation manually. Here's how:

1. Click on the Windows button and type **defrag** into the search bar.
2. Click Continue when the User Access Control pops up.
3. To change the schedule for defragmentation, click the Modify Schedule button. After you've picked the frequency (monthly is fine, weekly is OK, daily is foolish), day, and time for automatic defragmentation, click OK (see Figure 4.31).

**FIGURE 4.31**

Modify the defragmentation schedule so that Disk Defragmenter runs when the computer is on but not being used.

4. To prevent the system from automatically initiating defragmentation on a schedule, uncheck the box beside Run On a Schedule (Recommended). This is a useful option for users who run other tasks overnight.
5. To manually start the defragmentation process, click the Defragment Now button. The process will run with little user feedback. You'll simply have to wait for it to finish.

The defragmentation process makes the hard drive work hard, so you probably don't want to defragment any more than necessary. For the vast majority of users, a monthly schedule is probably adequate.

If defragging is not something you have been doing with XP, after upgrading your computer to Vista, you might want to set it to run manually once to clean up your hard drive. After that, set it to run every month automatically.

Optimize Scratch Disks

Like virtual memory, a *scratch disk* is an area of the hard drive allocated by a memory-intensive program to use as an extra workspace when a system runs low on RAM.

Programs that use scratch disks for optimal performance can be tweaked so the programs don't take any greater a toll on Windows Vista than necessary. That includes popular photo- and video-editing programs such as Adobe's Photoshop Elements and Premiere Elements.

The main trick to optimizing scratch disk performance, no matter what operating system you're using, is to make your scratch disk a different physical disk than the one that contains your operating system. It's generally better if it's a second physical hard drive installed inside the computer.

caution

If your system fails to defrag, try running it in Safe mode. Antivirus and antispyware programs can also sometimes cause Disk Defragmenter to abort, stop, or hang.

tip

Learn more about troubleshooting the Windows defragmenter at <http://www.cyberwalker.com/article.php?id=215&cid=34>.

caution

It's important to note here that it really is a second physical drive and not simply a second partition on the same physical hard disk that uses a different drive letter.

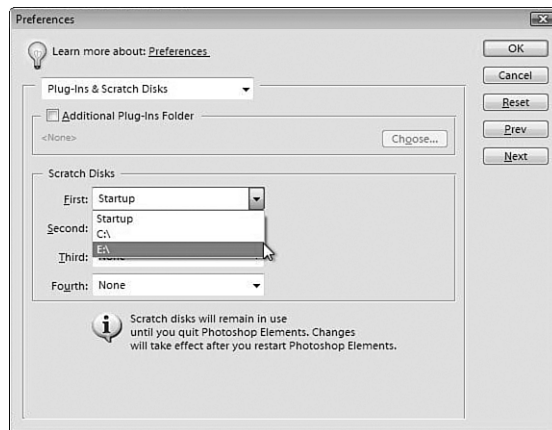
You can also use an external hard drive if it's connected on a USB 2.0 port (good) or a FireWire port (better).

To change the scratch disk within Photoshop Elements 4.0, do the following:

1. Open Elements to a document, either existing or new.
2. Click the Edit menu and scroll down to Preferences. Select Plug-ins & Scratch Disks from the drop-down menu.
3. Under the Scratch Disks submenu, click the triangle for the drop-down menu beside First, and choose the drive letter for your second internal hard drive or external drive. Click OK (see Figure 4.32).

FIGURE 4.32

Assign your application's scratch disk to a second physical drive like I did here with Adobe PhotoShop Elements 4.0.



The Fruits of Your Efforts: Performance Monitoring

Now, if after all this tweaking and optimizing, you do not see enormous gains in performance, I recommend that you take a hard look at the hardware upgrade section.

Look again at programs running in Startup, as they are the areas where you will get the most bang for your optimizing efforts.

There is one place where you can actually measure the changes you have made. It's called the Reliability Monitor. This is an applet that measures system stability. It tracks how your system has performed day in and day out and graphs it so you get a snapshot of how the system is performing over time.

To check it out, follow these steps:

1. Click the Windows button.
2. Type **reliability** and click the Reliability and Performance Monitor item when it appears in the Start menu.
3. Click Continue to approve the UAC box.
4. In the Reliability and Performance Monitor window, click the Reliability Monitor item on the left under Monitoring Tools.
5. You will see a chart (see Figure 4.33) that tracks your system reliability and shows how it has been performing over the previous weeks.

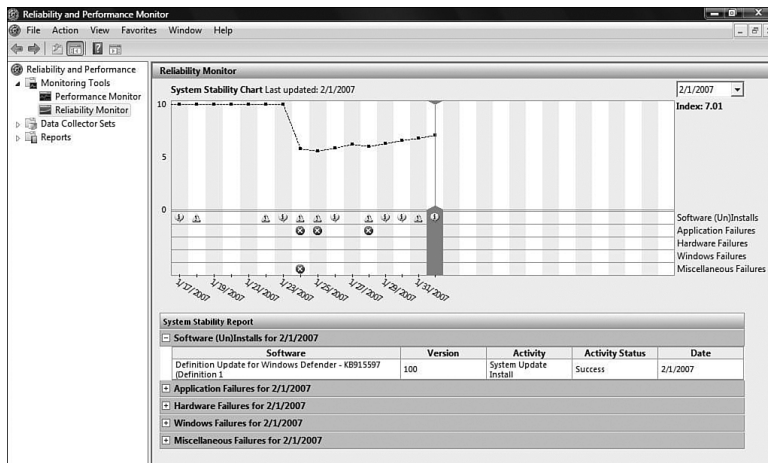


FIGURE 4.33

The Reliability and Performance Monitor is a handy tool you can use to see how your system is performing and whether you have seen any gains in reliability after optimizing it.

Look closely at the marks under Software (Un)Installs because you'll see the impact of removed software.

The rows of events running below the calendar also show various types of failures caused by programs, hardware, Windows, and miscellaneous items. Click on each one to learn more and look for more information below the chart to figure out what happened to the system during that event.

These are all clues to what might be causing problems in performance or what you did that improved performance and reliability on the system.

It's not definitive, but it's one more tool you can use in Vista to help you tweak the system into submission.