At this point, you must lead Windows by the nose to the printer's driver software. On the Add Printer Wizard screen, select your printer from the list of printers. If Windows doesn't list your printer there, or if its manufacturer supplied the Windows XP driver on a disk, click the Have Disk button, and then navigate to the CD, floppy disk, or downloaded Internet installation file that contains the driver.

Either way, subsequent wizard screens will invite you to type a short name for your printer, in order to make it available to other computers on the network (yes, Windows can even share, for example, a USB inkjet, even though it's not technically a network printer), to print a test page, and so on. (If the test page doesn't print out correctly, Windows XP launches its printer *troubleshooter*—a specialized wizard that offers you one troubleshooting suggestion after another until either you or Windows quits in frustration.)

The Printer Icon

If your driver-installation efforts are ultimately successful, you're rewarded by the appearance of an icon that represents your printer.

This icon appears in the *Printers and Faxes* window—an important window that you'll be reading about over and over again in this chapter. Exactly how you arrive there depends on how you've set up Windows XP:

- If you've set up your Start menu to display a submenu for the Control Panel (page 56), just choose Start→Control Panel→Printers and Faxes.
- If you view your Control Panel in *Classic* view (page 243), choose Start→Control Panel, and then open the Printers and Faxes icon.
- If you view your Control Panel in *Category* view, choose Start→Control Panel, click the Printers and Other Hardware link, and finally click the "View installed printers or fax printers" link.

The Printers and Faxes window should be listed in your Start menu, which saves you some burrowing if you use this feature a lot. If it's not there, for some reason,

TROUBLESHOOTING MOMENT

If Your Printer Model Isn't Listed

If your printer model isn't in the list of printers (Figure 13-3), then Windows XP doesn't have a driver for it. Your printer model may be very new (more recent than Windows XP, that is) or very old. You have two choices for getting around this roadblock:

First, you can contact the manufacturer (or its Web site) to get the drivers. Then install the driver software as described in the previous section.

Second, you can use the *printer emulation* feature. As it turns out, many printers work with one of several standard drivers that come from other companies. For example, many laser printers work fine with the HP LaserJet driver. (These laser printers are not, in fact, HP LaserJets, but they *emulate* one.)

The instructions that came with your printer should have a section on emulation; the manufacturer's help line can also tell you which popular printer yours can impersonate.

EX 2009

right-click the Start button. From the shortcut menu, choose Properties. On the Start Menu tab, click Customize, then click the Advanced tab. Scroll down in the list of checkboxes, and finally turn on "Printers and Faxes." Click OK twice.

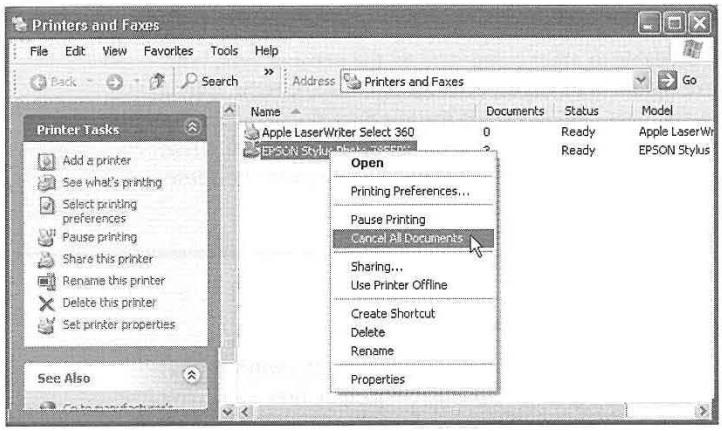


Figure 13-4: *At first, the task pane in the Printers and Faxes window offers only two commands. But when you click a printer icon, a long list of useful options appears, as shown here. Many of them duplicate the options that appear when you right-click a printer icon—something you'd be wise to remember the day your right mouse button breaks.*

GEM IN THE ROUGH

Installing Fake Printers

If your printer has two paper trays, switching to the secondary one is something of a hassle. You must spend time making the changes in the Print dialog box, as described later in this chapter. Similarly, switching the printout resolution from, say, 300 dpi to 600 dpi when printing important graphic documents is a multi-step procedure.

That's why you may find it useful to create several different icons for *the same printer*. The beauty of this stunt is that you can set up different settings for each of these icons. One might store canned settings for 600 dpi printouts from the top paper tray, another might represent 300 dpi printouts from the bottom one, and so on. When it comes time to print, you can switch between these virtual printers quickly and easily.

To create another icon, just run the Add Printer Wizard a second time, as described on the preceding pages. At the point in the installation where you name the printer, invent a name that describes this printer's alternate settings, like *HP6-600 dpi* or *Lexmark-Legal Size*.

When the installation process is complete, you'll see both printer icons—the old and the new—in the Printers and Faxes window. Right-click the new "printer" icon, choose Printing Preferences from the shortcut menu, and change the settings to match its role.

To specify which one you want as your *default* printer—the one you use most of the time—right-click the appropriate icon and choose Set as Default Printer from the shortcut menu.

But thereafter, whenever you want to switch to the other set of printer settings—when you need better graphics, a different paper tray, or other special options for a document—just select the appropriate printer from the Printer Name drop-down list in the Print dialog box (see Figure 13-5 at top). You've just saved yourself a half-dozen additional mouse clicks and settings changes.

EX 2009

Tip: If you're using your Start menu in Classic view (page 25), you get to your Printers and Faxes window by clicking Start→Settings→Printers and Faxes.

In any case, the Printers and Faxes window now contains an icon bearing the name you gave it during the installation (Figure 13-4). This printer icon comes in handy in several different situations, as the rest of this chapter clarifies.

Printing

Fortunately, the setup described so far in this chapter is a one-time-only task. Once it's over, printing is little more than a one-click operation.



Figure 13-5: *Top: The options in the Print dialog box are different on each printer model and each application, so your Print dialog box may look slightly different.*

For example, here are the Print dialog boxes from Microsoft Word and WordPad. Most of the time, the factory settings shown here are what you want (one copy, print all pages). Just click OK or Print (or press Enter) to close this dialog box and send the document to the printer.

Bottom: During printing, the tiny icon of a printer appears in your notification area. Pointing to it without clicking produces a pop-up tooltip like this that reveals the background printing activity.

EX 2009

Printing from Applications

After you've created a document you want to see on paper, choose File→Print (or press Ctrl+P). The Print dialog box appears, as shown in Figure 13-5.

This box, too, changes depending on the program you're using—the Print dialog box in Microsoft Word looks a lot more intimidating than the WordPad version—but here are the basics:

- **Select Printer.** If your PC is connected to several printers, or if you've created several differently configured icons for the same printer, choose the one you want from this drop-down list or scrolling panel of printer icons.
- **Preferences/Properties.** Clicking this button opens a version of the printer's Properties dialog box, as shown in Figure 13-6.

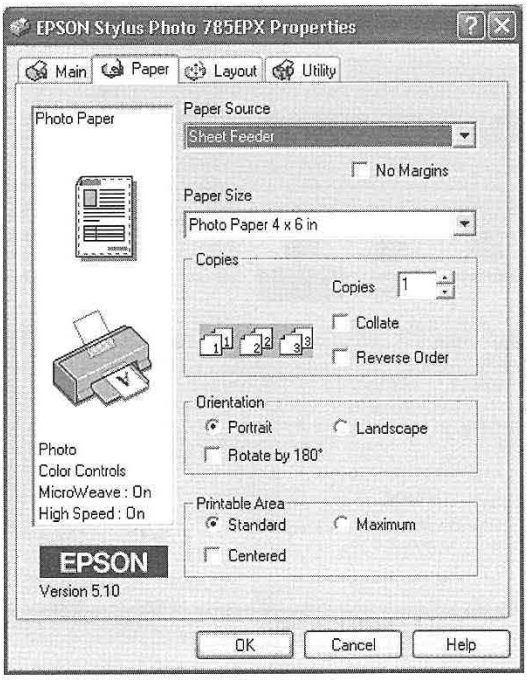


Figure 13-6:
When you choose Properties from the Print dialog box, you can specify the paper size you're using, whether you want to print sideways on the page ("Landscape" orientation), what kind of photo paper you're using, and so on. Here, you're making changes only for a particular printout; you're not changing any settings for the printer itself. (The specific features of this dialog box depend on the program you're using.)

- **Page range.** These controls specify which pages of the document you want to print. If you want to print only some of the pages, click the Pages option and type in the page numbers you want (with a hyphen, like *3-6* to print pages 3 through 6).

EX 2009

Tip: You can also type in individual page numbers with commas, like *2, 4, 9* to print only those three pages—or even add hyphens to the mix, like this: *1-3, 5-6, 13-18.*

Click Current Page to print only the page that contains the blinking insertion point. Click Selection to print only the text you selected (highlighted) before opening the Print dialog box. (If this option button is dimmed, it's because you didn't highlight any text—or because you're using a program that doesn't offer this feature.)

- **Number of copies.** To print out several copies of the same thing, use this box to specify the exact amount. You'll get several copies of page 1, then several copies of page 2, and so on—*unless* you also turn on the Collate checkbox, which produces complete sets of pages, in order.
- **Print.** The Print drop-down list in the lower-left section of the dialog box offers three options: "All pages in range," "Odd pages," and "Even pages."

  Use the Odd and Even pages options when you have to print on both sides of the paper, but your printer has no special feature for this purpose. You'll have to print all the odd pages, turn the stack of printouts over, and run the pages through the printer again to print even page sides.
- **Application-specific options.** The particular program you're using may add a few extra options of its own to this dialog box. Figure 13-7 shows a few examples from Internet Explorer's Print dialog box.

When you've finished making changes to the print job, click OK or Print, or press Enter. Thanks to the miracle of *background printing,* you don't have to wait for the document to emerge from the printer before returning to work on your PC. In fact, you can even exit the application while the printout is still under way, generally speaking.

Tip: You'll probably never want to turn off background printing. But if you must for some technical reason, you'll find the on/off switch in the Advanced Properties dialog box for your printer (see Figure 13-10 for instructions on getting there). Select "Print directly to the printer" to turn off background printing.

POWER USERS' CLINIC

Printing from a DOS Program

Windows programs don't need any special setup steps to print. But if you want to print from a DOS application, you must first tell it which port your printer is connected to.

To do so, find the printing options menu. There you'll be able to tell the software the name of the port to which your printer is connected (usually LPT1).

Unfortunately, the commands required to print are unique to each DOS program; knowing them is up to you.

EX 2009

Printing from the Desktop

You don't necessarily have to print a document while it's open in front of you. You can, if you wish, print it directly from the desktop—via an open disk or folder window, or Windows Explorer, for example—in any of three ways:

- Right-click the document icon, and then choose Print from the shortcut menu. Windows launches the program that created it—Word or Excel, for example. The Print dialog box appears, so that you can specify how many copies you want and which pages you want printed. When you click Print, your printer springs into action, and then the program quits automatically (if it wasn't already open).
- If you've opened the Printers and Faxes window, you can drag a document's icon directly onto a printer icon.
- If you've opened the printer's own print queue window (Figure 13-8) by double-clicking the Printers icon in your Printers and Faxes window, you can drag any document icon directly into the list of waiting printouts. Its name joins the others on the list.

These last two methods bypass the Print dialog box, and therefore give you no way to specify which pages you want to print, nor how many copies. You just get one copy of the entire document.

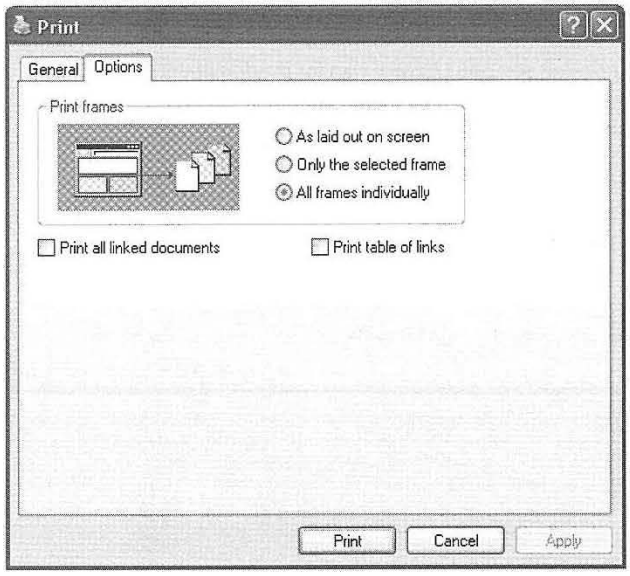


Figure 13-7:
The Web page about to be printed uses frames *(individual, independent, rectangular sections). The Print dialog box in Internet Explorer recognizes frames, and lets you specify exactly which frame or frames you want to print. If the page contains links to* other *Web pages (and these days, what Web page doesn't?), you can print those Web pages, too, or just print a table of the links (a list of the URL addresses).*

EX 2009

Printing from the Internet

If you use Internet Explorer to browse the Web (see Chapter 11), the Print dialog box offers a tab called Options, which contains a few special features for printing Web pages. Figure 13-7 illustrates a few of them.

Controlling Printouts

Between the moment when you click OK in the Print dialog box and the arrival of the first page in the printer's tray, there's a delay. When printing a complex document with lots of graphics, the delay can be considerable.

Fortunately, the waiting doesn't necessarily make you less productive, since you can return to work on your PC, or even quit the application and go watch TV. An invisible program called the *print spooler* supervises this background printing process. The spooler collects the document that's being sent to the printer, along with all the codes the printer expects to receive, and then sends this information, little by little, to the printer.

Note: The spooler program creates huge temporary printer files, so a hard drive that's nearly full can wreak havoc with background printing.

To see the list of documents waiting to be printed—the ones that have been stored by the spooler—open the Printers and Faxes window, and then double-click your printer's icon to open its window.

Tip: While the printer is printing, a printer icon appears in the notification area. As a shortcut to opening the printer's window, just double-click that icon.

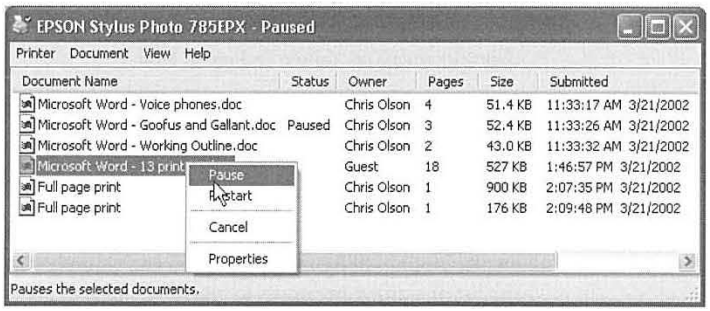


Figure 13-8: *The first document, called "Microsoft Word–Voice phones.doc," has begun printing; the second one, you've put on hold. Several other documents are waiting. By right-clicking documents in this list, you can pause or cancel any document in the queue–or all of them at once.*

EX 2009

The printer's window lists the documents currently printing and waiting; this list is called the *print queue* (or just the *queue*), as shown in Figure 13-8. (Documents in the list print in top-to-bottom order.)

You can manipulate documents in a print queue in any of the following ways during printing:

- **Put one on hold.** To pause a document (put it on hold), right-click its name and choose Pause from the shortcut menu. When you're ready to let the paused document continue to print, right-click its listing and reselect Pause to turn off the checkmark.
- **Put them all on hold.** To pause the printer, choose Printer→Pause Printing from the printer window menu bar. You might do this when, for example, you need to change the paper in the printer's tray. (Choose Printer→Pause Printing again when you want the printing to pick up from where it left off.)

Note: You can also pause the printer by right-clicking its icon in the Printers and Faxes window and choosing Pause Printing from the shortcut menu. (To undo this procedure, right-click the icon and choose Resume Printing.)

- **Add another one.** As noted earlier, you can drag any document icon directly *from its disk or folder window* into the printer queue. Its name joins the list of printouts-in-waiting.
- **Cancel one.** To cancel a printout, click its name and then press the Delete key—or, alternatively, right-click its name and choose Cancel from the shortcut menu. Either way, if you click Yes in the confirmation box, the document disappears from the queue; now it'll never print out.
- **Cancel all of them.** To cancel the printing of all the documents in the queue, choose Printer→Cancel All Documents. (Alternatively, right-click the printer icon itself in the Printers and Faxes window and choose Cancel All Documents from the shortcut menu, as shown in Figure 13-4.)

Note: A page or so may still print after you've paused or canceled a printout. The explanation: Your printer has its own memory (the *buffer*), which stores the printout as it's sent from your PC. If you pause or cancel printing, you're only stopping the spooler from sending *more* data to the printer.

- **Rearrange them.** If you're used to, say, Windows Me, it may take you a moment—or an afternoon—to figure out why you can't simply drag documents up or down in the list of waiting printouts to rearrange their printing order. In Windows XP, the procedure is slightly more involved.

  Start by right-clicking the name of one of the printouts-in-waiting; from the shortcut menu, choose Properties. On the General tab, drag the Priority slider left or right (documents with higher priorities print first).

EX 2009

Fancy Printer Tricks

The masses of Windows users generally slog through life, choosing File→Print, clicking OK, and then drumming their fingers as they wait for the paper to slide out of the printer. But your printer can do more than that—much more. Here are just a few of the stunts that await the savvy PC fan.

Printing at 39,000 Feet

Printing any document is really a two-step procedure. First, Windows converts the document into a seething mass of printer codes in the form of a *spool file* on your hard drive. Second, it feeds that mass of code to the printer.

When you're not connected to your printer—for example, when you're sitting in seat 23B several miles over Detroit—you can separate these two tasks. You can do the time-consuming part of the printing operation (creating the spool files) right there on the plane. Then, later, upon your happy reunion with the printer, you can simply unleash the flood of stored spool files, which will print very quickly.

To set this up, right-click the icon for your printer in the Printers and Faxes window (Figure 13-4). From the shortcut menu, choose Pause Printing. That's all there is to it. Now you can merrily "print" your documents, 100 percent free of error messages. Windows quietly stores all the half-finished printouts as files on your hard drive.

When the printer is reconnected to your machine, right-click its icon once again—but this time, choose Resume Printing from its shortcut menu. You'll find that the printer springs to life almost immediately, spewing forth your stored printouts with impressive speed.

Sharing a Printer

If you have more than one PC connected to a network, as described in Chapter 17, they all can use the same printer. In the old days, this convenience was restricted to expensive Ethernet network printers like laser printers. But in Windows XP, you can share even the cheapest little inkjet that's connected to the USB port of one computer.

To begin, sit down at the computer to which the printer is attached. In the Printers and Faxes window, right-click the printer's icon and, from the shortcut menu, choose Sharing. Proceed as described in Figure 13-9.

Once you've *shared* the printer, other people on the network can add it to their own Printers and Faxes windows like this:

1. **In the Printers and Faxes window, click "Add a printer" in the task pane at the left side.**

   The Add a Printer Wizard appears, exactly as described earlier in this chapter.

2. **Click Next. On the second screen, click the bottom option: "A network printer, or a printer attached to another computer." Click Next.**

EX 2009

Now you're asked to locate the printer that's been shared. If you're like most people, you'll want to *browse* for it (choose it from a list). If you're a geek, you can click the second button and then type the printer's *UNC code* (page 537). And if you're geeky beyond belief, you can use the third option, which lets you send your printouts to a printer *somewhere else on the Internet.* (The downside: Bringing the printouts back to your desk can take days.)

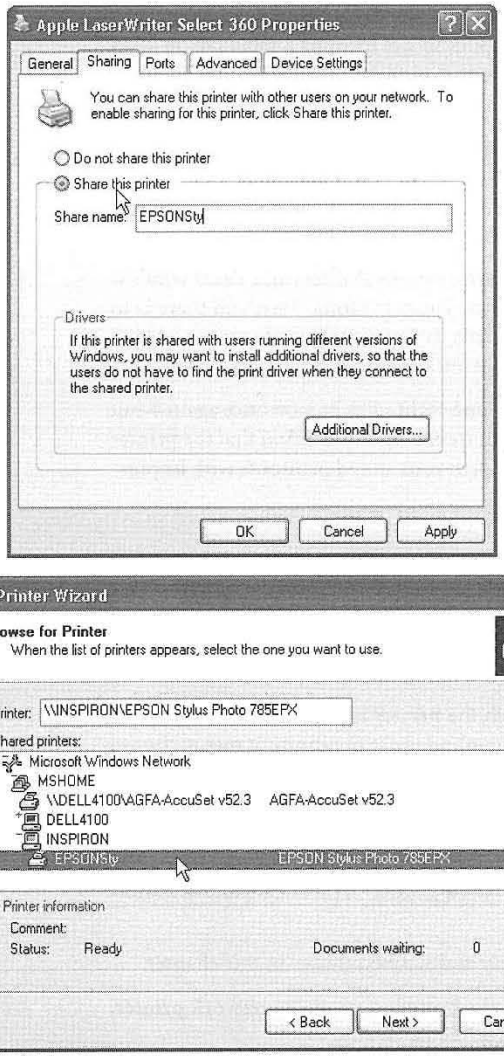


Figure 13-9:
Top: Turn on "Share this printer," and then give the printer a name in the Share name text box. (No spaces or punctuation allowed–and keep it short.) Click OK. The printer is now available on your network.

Bottom: Other people, seated at their own computers, can now bring your printer onto their own screens. (If the other PCs aren't running Windows XP, click the Additional Drivers button on the Sharing tab and turn on the checkboxes for the Windows versions they are using.)

EX 2009

3. Select "Connect to this printer (or browse for a printer)," and then click Next. On the screen that appears, click the name of the printer you want, as shown in Figure 13-9 at bottom.

On the final screens of the wizard, you'll be asked if you want this printer to be your default (primary) printer. After answering, click the Finish button to close the wizard. The shared printer now appears in your Printers and Faxes folder, even though it's not directly connected to your machine.

Printing to a File

When it comes to printing, most of the time you probably think of printing onto paper. In certain circumstances, however, you may not actually want a printout. Instead, you might want to create an electronic printer file on your hard drive, which can be printed later. You might want to do so, for example, when:

- You're working on a document at home, and you've got only a cheesy $49 inkjet printer. By creating a printer file, you can delay printing until tomorrow, in order to use the office's $4,000 color laser printer.
- You plan to send your finished work to a service bureau—that is, a professional typesetting shop. Sending a finished printer file avoids incompatibilities of applications, fonts, layout programs, and so on.
- You want to give a document to someone who doesn't have the program you used to create it, but has the same printer. If you email the *printer file* to her, she'll get to see your glorious design work slide out of her printer nonetheless.

Creating a printer file

To create such a printer file, choose File→Print, just as you would print any document. The Print dialog box appears; now turn on the "Print to file" option. When you then click OK or Print, the Print to File dialog box opens. It resembles the standard Save As dialog box, in that you can choose a drive, a folder, and a filename. The file type for a document printing to a file is a Printer File, which has the file extension *.prn*.

Printing a printer file

To print a printer file, choose Start→All Programs→Accessories→Command Prompt. You've just started an MS-DOS command session; your cursor is blinking on the command line.

Now type this:

copy c:\foldername\filename**.prn lpt1: /b**

Here's how this instruction breaks down:

- **Copy** is the name of the command you use to print the file—notice that it's followed by a space.

EX 2009

- **C:** is the letter of the drive that contains your printer file. Omit this part if the printer file is on the current drive (usually C:).
- **\foldername** is the name of the folder into which you saved the printer file.
- **\filename** is the name you gave the file.
- **.prn** is the filename extension (which Windows added to the file automatically when you saved the printer file).
- **lpt1:** is the port to which the printer is connected. Note the colon following the name, and also note there's a space *before* this part of the command. If the printer is attached to LPT2, substitute that port name.
- **/b** tells the Copy command that the file is *binary* (containing formatting and other codes), not simply text.

Note: A printer file (a *.prn* file) can only be printed on the same model that was selected in the Print dialog box when the file was generated. If you want to create a printer file for that color printer at work, in other words, be sure to first install its driver on your computer.



Figure 13-10: *Right-click your printer's icon in the Printers and Faxes window. From the shortcut menu, choose Properties, then click the Advanced tab, shown here. Select "Available from," and use the time setting controls to specify when your underlings are allowed to use this printer from across the network. Clicking OK renders the printer inoperable during off-hours.*

EX 2009

Limiting Hours of Access

If it's just you, your Dell, and a color inkjet, then you're entitled to feel baffled by this feature, which lets you declare your printer off-limits during certain hours of the day. But if you're the manager of some office whose expensive color laser printer makes printouts that cost a dollar apiece, you may welcome a feature that prevents employees from hanging around after hours in order to print out 500 copies of their head shots.

To specify such an access schedule for a certain printer, follow the instructions in Figure 13-10.

POWER USERS' CLINIC

Color Management

As you may have discovered through painful experience, computers aren't great with color. That's because each device you use to create and print digital images "sees" color a little bit differently, which explains why the deep amber captured by your scanner may be rendered as brownish on your monitor, but come out as a bit orangey on your Epson inkjet printer. Since every gadget defines and renders color in its own way, colors are often inconsistent as a print job moves from design to proof to press.



The Windows *color management system* (CMS) attempts to sort out this mess, serving as a translator among all the different pieces of hardware in your workflow. For this to work, each device (scanner, monitor, printer, copier, and so on) must be calibrated with a unique *CMS profile*–a file that tells your PC exactly how your particular monitor (or scanner, or printer, or digital camera) defines colors. Armed with the knowledge contained within the profiles, the CMS software can make on-the-fly color corrections, compensating for the various quirks of the different devices.

Most of the people who lose sleep over color fidelity do commercial color scanning and printing, where "off" colors are a big deal–after all, a customer might return a product after discovering, for example, that the actual product color doesn't match the photo on a Web site. Furthermore, not every gadget comes with a CMS profile, and not every gadget can even accommodate one (if yours does, you'll see a tab called Color Management in the Properties dialog box for your printer, as shown here).

If you're interested in this topic, open the Color Management tab for your printer. The Automatic setting usually means that Windows came with its own profile for your printer, which it has automatically assigned. If you click Manual, you can override this decision and apply a new color profile (that you downloaded from the printer company's Web site, for example).

Remember to follow the same procedure for the other pieces of your color chain–monitors, scanners, and so on. Look for the Color Management tab or dialog box, accessible from their respective Properties dialog boxes.

EX 2009

Add a Separator Page

If your PC is on a network whose other members bombard a single laser printer with printouts, you might find *separator pages* useful—the printer version of fax cover sheets. A separator page is generated before each printout, identifying the document and its owner.

This option, too, is accessible from the Advanced tab of the printer's Properties dialog box (Figure 13-10). Click the Separator Page button at the bottom of the dialog box. In the Separator Page dialog box, click the Browse button to choose a *.sep* (separator page) file.

You'll see that Windows XP comes with four of them:

- **Sysprint.sep** is the one you probably want. Not only does this page include the name, date, time, and so on, but it also automatically switches the laser printer to PostScript mode—if it's not already in that mode.
- **Pcl.sep** is the same idea, except that it switches the laser printer to PCL mode—commonly found on HP printers—before printing. (PostScript and PCL are the two most common languages understood by office laser printers.)
- **Pscript.sep** switches the printer to PostScript mode, but doesn't print out a separator page.
- **Sysprtj.sep** prints a separator page, switches the printer to PostScript mode, and sets Japanese fonts, if they're available on your printer.

Save Printouts for Later

Ordinarily, each printout travels from your PC into a temporary holding file on the hard drive (the spool file), gets fed from there to the printer, and then disappears forever.

But sometimes it can be useful to keep the spool files on hand for use later. Maybe you print standard contracts all the time, or price lists, or restaurant menus. It's much faster to reprint something directly from the spool file than to open the original document and print it again from scratch.

The key to making Windows hang onto your already-printed documents is in the Advanced tab of the printer's Properties dialog box (see Figure 13-10). Just turn on "Keep printed documents."

From now on, every time you generate a printout, Windows maintains a copy of it in the printer's window (the one that appears when you double-click the printer icon in the Printers and Faxes window; see Figure 13-8). To reprint a document you've already printed, right-click its name in this list and choose Restart from the shortcut menu. (If you do this frequently, consider dragging the printer icon to your desktop, to the Start menu, or to the Quick Launch toolbar so that it will be easier to open the next time around.)

EX 2009

Tip: Behind the scenes, Windows XP stores these saved printouts in the Local Disk (C:)→Windows→System32→Spool→Printers folder. Over time, all of your saved printouts can consume quite a bit of disk space. It's worth opening up that folder now and then to clean out the ones you no longer need.

Printer Troubleshooting

If you're having a problem printing, the first diagnosis you must make is whether the problem is related to *software* or *hardware.* A software problem means the driver files have become damaged. A hardware problem means there's something wrong with the printer, the port, or the cable.

Test the printer by sending it a generic text file from the command line. (Printing a regular printer disk file isn't an effective test, because if there's a problem with the driver, the codes in the file are likely to contain the problem.) To perform such a test, locate a text file, or create one in Notepad. Then choose Start→All Programs→Accessories→Command Prompt; send the file to the printer by typing *copy filename.txt prn* and then pressing Enter. (Of course, remember to type the file's actual name and three-letter extension instead of *filename.txt.*)

If the file prints, the printing problem is software-related. If it doesn't work, the problem is hardware-related.

For software problems, reinstall the printer driver by opening the Printers and Faxes window, right-clicking the printer's icon, and choosing Delete from the shortcut menu. Then reinstall the printer as described at the beginning of this chapter.

If the problem seems to be hardware-related, try these steps in sequence:

- Check the lights or the LED panel readout on the printer. If you see anything besides the normal "Ready" indicator, check the printer's manual to diagnose the problem.
- Turn the printer off and on to clear any memory problems.
- Check the printer's manual to learn how to print a test page.
- Check the cable to make sure both ends are firmly and securely plugged into the correct ports.
- Test the cable. Use another cable, or take your cable to another computer/printer combination.

Another way to check all of these conditions is to use the built-in Windows *troubleshooter*—a wizard specifically designed to help you solve printing problems. To run, choose Start→Help and Support. In the Help center, click "Printing and faxing," and on the next screen, click "Fixing a printing problem." Finally, click "Printing Troubleshooter."

EX 2009

If none of these steps leads to an accurate diagnosis, you may have a problem with the port, which is more complicated. Or even worse, the problem may originate from your PC's motherboard (main circuit board), or the printer's. In that case, your computer (or printer) needs professional attention.

Fonts

Some extremely sophisticated programming has gone into the typefaces that are listed in the Fonts dialog boxes of your word processor and other programs. They use *OpenType* and *TrueType* technology, meaning that no matter what point size you select for these fonts, they look smooth and professional—both on the screen and when you print.

Managing Your Fonts

Windows XP comes with several dozen great-looking OpenType and TrueType fonts: Arial, Book Antiqua, Times New Roman, and so on. But the world is filled with additional fonts. You may find them on the CD-ROMs that come with PC magazines, on Windows software Web sites, or in the catalogs of commercial typeface companies. Sometimes you'll find new fonts on your system after installing a new program, courtesy of its installer.

To review the files that represent your typefaces, open the Fonts icon in the Control Panel.

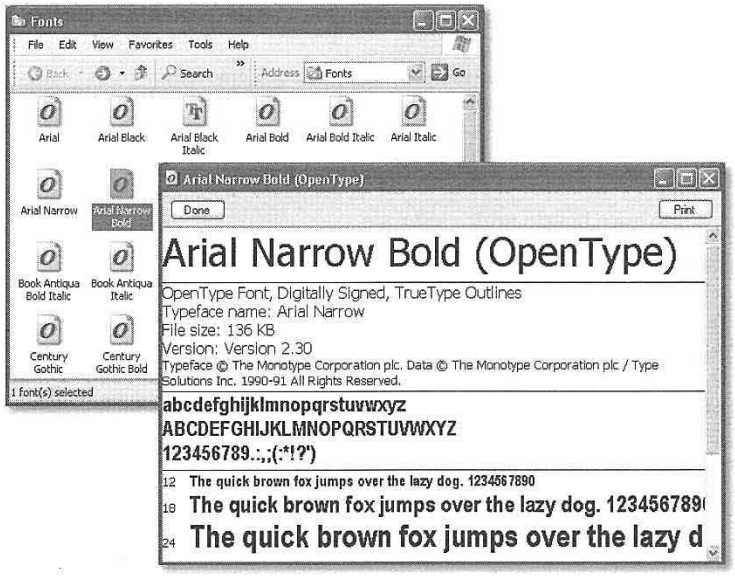


Figure 13-11: *All of your fonts sit in the Fonts folder (top); you'll frequently find an independent font file for each style of a font: bold, italic, bold italic, and so on. You can tell a TrueType font by its TT icon, or an OpenType font by its O icon. Those marked by an A may be PostScript fonts, which come with a phalanx of* the printer font *files that they require; others may look fine on the screen, but may not print out smoothly. Double-click a font's icon to see what the font looks like (bottom).*

EX 2009

Tip: The Fonts icon in your Control Panel window is only a shortcut to the *real* folder, which is in your Local Disk (C:)→Windows→Fonts folder.

When you open the Fonts folder, you'll see that for every font that appears in the Font menus of your various programs, there's an icon on your hard drive—or several. As Figure 13-11 illustrates, it's easy and enlightening to explore this folder.

To remove a font from your system, simply drag its file icon out of this window, right-click it and then choose Delete from the shortcut menu, or highlight it and then choose File→Delete. To install a new font, drag its file icon into this window (or choose File→Install New Font, and then navigate to, and select, the font files you want to install).

Either way, you'll see the changes immediately reflected in your programs' Font dialog boxes.

Tip: Some fonts appear in your menus, but *not* in your Fonts menu. These are the fonts that Windows uses in its menus, windows, and dialog boxes (Courier, MS Sans Serif, Small Fonts, Symbol, and so on). If you accidentally remove or move any of these fonts, Windows will substitute something that doesn't look right, and you'll wonder what the heck is going on with the typography of your programs. That's why, unless you've turned on the "Show hidden files" option (page 80), these files are invisible in the Fonts folder.

Faxing

It's a good thing you bought a book about Windows XP. If you hadn't, you might never have known about one of Windows XP's most spectacular features: its ability to turn your PC's built-in fax modem into a fax machine. This feature works like a charm, saves all kinds of money on paper and fax cartridges, and may even spare you the expense of buying a physical fax machine—but it isn't installed in the standard Windows installation.

Here's the basic idea: When faxes come in, you can opt to have them printed automatically, or you can simply read them on the screen. And sending a fax is even easier on a PC than on a real fax machine; you just use the regular File→Print command, exactly as though you're making a printout of the onscreen document.

If this sounds good to you, grab your Windows XP CD-ROM and read on.

Installing the Fax Software

To turn on the hidden fax feature, open your Printers and Faxes window (page 405), and then click "Set up faxing" on the task pane on the left side (Figure 13-12, left). After a moment, you'll be asked to insert your Windows XP Home Edition CD.

EX 2009

Tip: When the big blue "Welcome to Microsoft Windows XP" screen appears, just click its close button. It's obscuring the *real* action in the Configuring Components dialog box behind it.

When the installation is over, you'll find a new Fax icon in your Printers and Faxes folder (Figure 13-12, right). You'll also find a few fax utilities in your Start→All Programs→Accessories→Communications→Fax submenu, which you can read about in the following sections.

Note: Upgrading your PC to Windows XP from an earlier version of Windows enables you to import your old fax collection into the newer software. For instructions, choose Start→All Programs→Accessories→Communications→Fax→Fax Console. Choose Help→Help Topics, and read the help topics under the first headline ("Fax after upgrading to Windows XP").

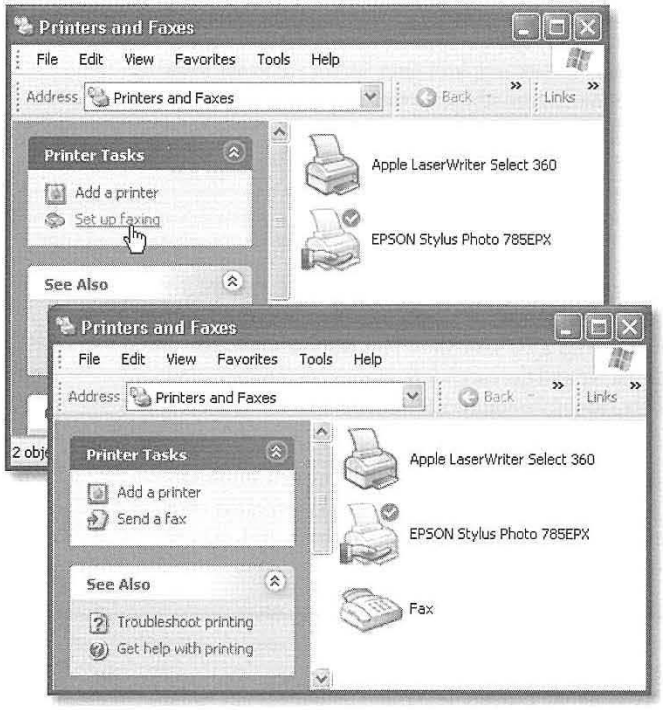


Figure 13-12:
Top: In the Printers and Faxes window, click the "Set up faxing" link on the task pane at the left side of the window. Insert the Windows XP CD when the wizard asks you to do so.

Bottom: The Fax icon is added to the Printers and Faxes window, ready to use.

Getting Ready to Fax

Before you fax, choose Start→All Programs→Accessories→Communications→Fax→Fax Configuration Wizard (or choose Tools→Configure Fax from the Fax

EX 2009

Console window). You'll be treated to the Fax Configuration Wizard, whose screens walk you through these steps:

- **Filling in your own name, email address, fax number, address, and other information.** This information will appear on your fax cover sheet, so that the lucky recipient can contact you if the fax didn't come through. (*All* of this information is optional.)
- **Choosing the fax device.** This drop-down list is provided solely for the convenience of those rich people who actually have more than one fax modem on their PCs.

  There are two useful checkboxes here for everyone, however: Enable Send and Enable Receive. The ability to send faxes is a no-brainer. But not everybody wants their PC to *receive* faxes; see "Receiving a Fax" on page 426.
- **Specifying your own fax number.** Microsoft calls this the *TSID* (transmitting subscriber identification) information—the name and fax number that will appear on the screen of the receiving fax machine.
- **Specifying your fax number again.** You see this screen only if you indicated that you want your PC to receive faxes. Once again, you're supposed to enter your name and fax number, which will appear on the screen of the *sending* fax machine during transmission.

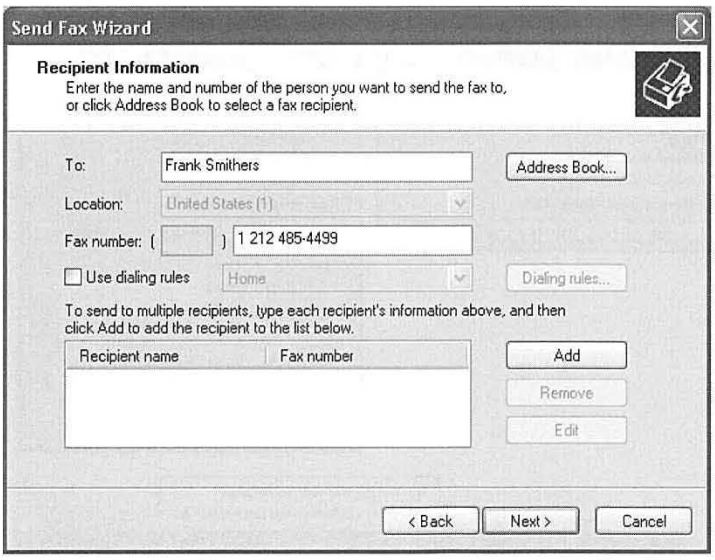


Figure 13-13: *If "Use dialing rules" is turned off, then just type the entire fax number, complete with the area code, the number 1 for long distance, and so on, into the second "Fax number" box. Commas, parentheses, and dashes are irrelevant. But if you turn on "Use dialing rules," you can choose one of the canned dialing setups—complete with calling card information, bizarre local area code dialing procedures, and so on—that you set up as described on page 312.*

EX 2009

- **Choosing a fax destination.** Here again, you see this screen only if you've declared that you want your PC to receive faxes. Windows gives you the option of having incoming faxes automatically printed, or stored as graphics files in a certain folder. (This option stores a *second* copy of each fax as a file; each fax is automatically stored in the Inbox of Fax Console, which is described later.)

The final wizard screen displays a summary of the settings you've made. Click the Finish button, and you're all set. You can change the settings at any time, just by running the wizard again.

Sending a Fax

The one big limitation of PC-based faxing is that you can only transmit documents that are, in fact, *on the computer.* That pretty much rules out faxing notes scribbled on a legal pad, clippings from *People* magazine, and so on (unless you scan them first).

If you're still undaunted, the procedure for sending a fax is very easy. Just open up whatever document you want to fax. Choose File→Print. In the Print dialog box, click the Fax icon (or choose Fax from the Name drop-down list), and then click OK or Print.

Now the Send Fax Wizard appears. This is where you can type in the phone number of the fax machine you're trying to reach (Figure 13-13)—or click Address Book to select the fax machine of somebody in your address book.

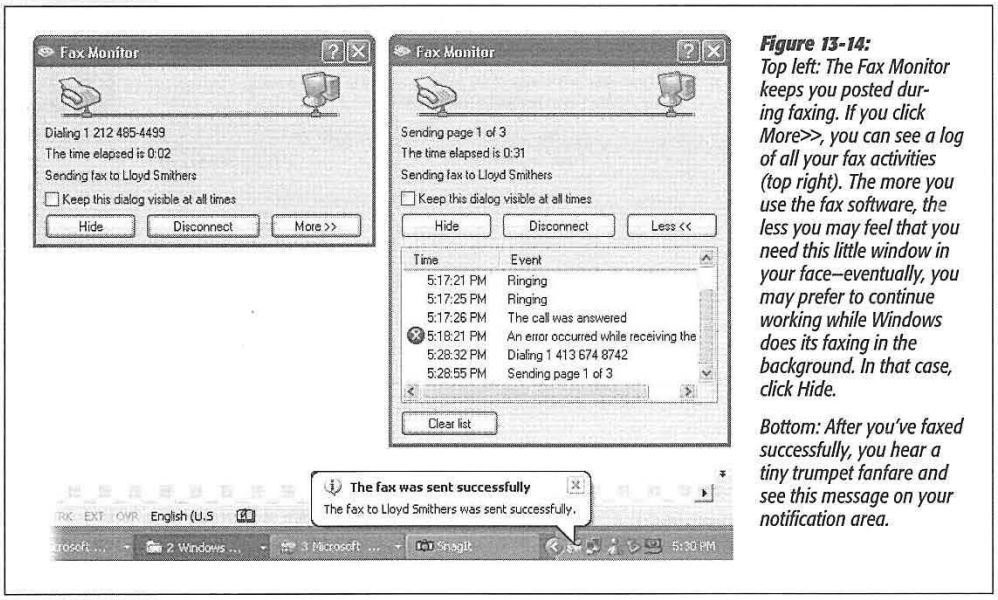


Figure 13-14: *Top left: The Fax Monitor keeps you posted during faxing. If you click More>>, you can see a log of all your fax activities (top right). The more you use the fax software, the less you may feel that you need this little window in your face—eventually, you may prefer to continue working while Windows does its faxing in the background. In that case, click Hide.*

Bottom: After you've faxed successfully, you hear a tiny trumpet fanfare and see this message on your notification area.

EX 2009

Click Next. On the second wizard screen, you can opt to precede the fax with a cover page. This screen also gives you a place to type in a subject line and a little note, if you like, which will also appear on the cover page.

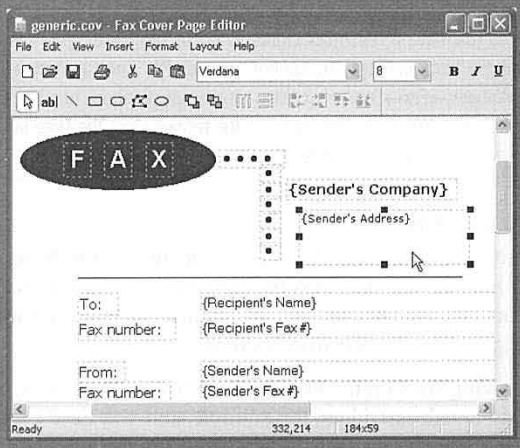
When you click Next again, Windows asks *when* you want the fax sent. Most of the time, of course, you'll just accept the proposed choice—Now—and click Next. But if you work in an office where the fax line is busy all the time, you can schedule your fax to go out at a specified time ("Specific time in the next 24 hours") or "When discount rates apply."

POWER USERS' CLINIC

Cover Page Art Class

You don't have to be content with the handful of fax cover pages that Microsoft provides. The Fax Console program comes with its own little cover page design studio. To get started, choose Tools→Personal Cover Pages.

At this point, you could click the New button to call up a pure, empty, virginal cover page. But by far the easiest way to get going is to open one of the existing cover pages, make changes to it, and then save it under a different name.



To do so, click the Copy button now in front of you, and then open one of the four cover page templates that Windows presents. Windows puts it into what's now a one-item list in the Personal Cover Pages window. Click Rename to give it a new name, if you like, and then click Open to begin work on your redesign. (You'll see a "Did you know?" Tips window; read the tips, if you like, and then click OK.)

The design program works like any standard drawing program. In order to type text that won't change—a confidentiality notice, for example—click the Text tool on the toolbar (which looks like this: **ab|**), and then click on the page. Use the commands in the Insert menu to plop placeholder text boxes onto the page—special rectangles that, on the actual cover sheet, will be filled by your name, fax number, the number of pages, and so on. You can transfer your own company logo onto the page just by pasting it there (Edit→Paste).

Every item that you place on the page—a text block, a graphic, and so on—is a separate object that you can move around independently using the arrow tool. In fact, you can even move a selected object in front of, or behind, other objects, using the commands in the Layout menu.

When you're finished with your masterpiece, choose File→Save As, and type a new name for it. It gets saved into your My Documents→Fax→Personal Cover pages folder (meaning that only you have access to it—not other people who share the PC and log in with their own accounts).

EX 2009

Note: "When discount rates apply" is a lame-duck holdover from the days when long distance companies charged more during business hours. If this still matters to you, however, you must first tell Windows *when* discount rates apply. To do so, right-click the Fax icon in your Printers and Faxes window; choose Properties. Click the Devices tab, click the Properties button, and use the "Discount rates start" and "Discount rates stop" controls to specify your window of opportunity.

On the final wizard screen, you can simply click Finish to send the fax. However, you may want to click the Preview Fax button to give it a final inspection before it goes forth over the airwaves. When you're finished looking it over, close the window and then click Finish.

After a moment, a little window appears called Fax Monitor (Figure 13-14). It keeps you posted on the progress of the fax.

Your recipient is in for a real treat. Faxes you send straight from your PC's brain emerge at the receiving fax machine looking twice as crisp and clean as faxes sent from a stand-alone fax machine. After all, you never scanned them through a typical fax machine's crude scanner on your end.

Tip: If you just have a few quick words to fax to somebody, you can use the Send Fax Wizard by itself, without first opening a document on your PC. Choose Start→All Programs→Accessories→Communications→Fax→Send a Fax. Fill in your recipient's phone number, click Next, and on the Preparing the Cover Page screen, type your memo to the recipient into the Note field. Windows will send only the cover page, complete with your note.

Receiving a Fax

There are several reasons why you may *not* want your PC to receive faxes. Maybe you already have a stand-alone fax machine that you use for receiving them. Maybe your house only has one phone line, whose number you don't want to give out to people who might blast your ear with fax tones.

But receiving faxes on the PC has a number of advantages, too. You don't pay a cent for paper or ink cartridges, for example, and you have a handy, organized software program that helps you track every fax you've ever received.

Exactly what happens when a fax comes in is up to you. As noted earlier, you can make this decision by running the Fax Configuration Wizard, or by opening the dialog box shown in Figure 13-15, to change its behavior at any time.

Here are your options (see Figure 13-15):

- **Manual.** This option is an almost-perfect solution if your PC and your telephone share the same phone line—that is, if you use the line mostly for talking, but occasionally receive a fax. From now on, every time the phone rings, a balloon in your notification area announces: "The line is ringing. Click here to answer this call as a fax call" (Figure 13-15, middle).

EX 2009

When you do so, the Fax monitor program appears and downloads the fax. To see it, open your Fax Console program, described on page 428.

- **Answer automatically.** Use this option if your PC has a phone line all to itself. In this case, incoming faxes produce a telephone-ringing sound, but there's otherwise no activity on your screen until the fax has been safely received (Figure 13-15, bottom). Once again, received faxes secrete themselves away in your Fax Console program.

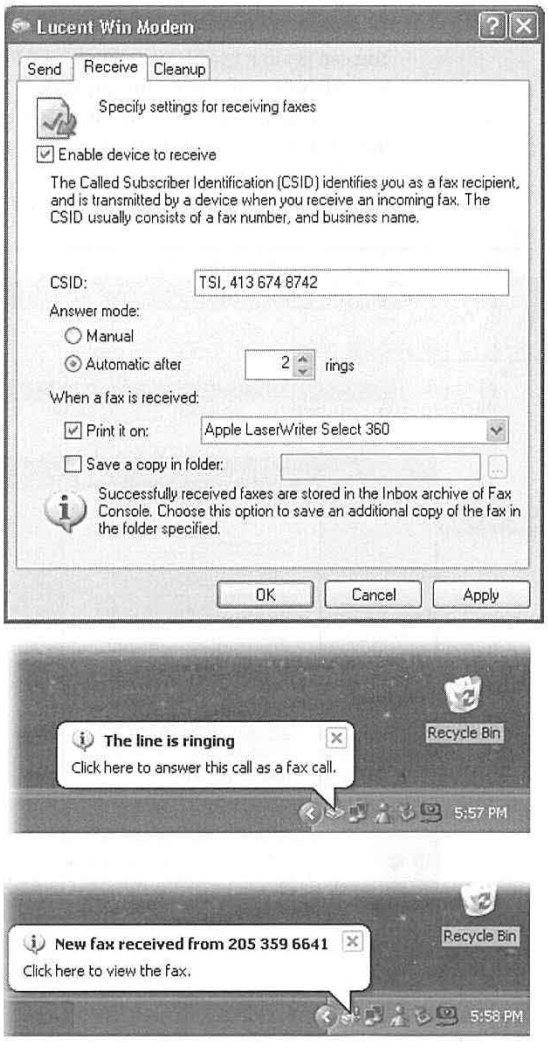


Figure 13-15:
Top: This dialog box offers all of the options for receiving faxes. Getting here, however, is no picnic. Right-click the Fax icon in your Printers and Faxes window; choose Properties. Click the Devices tab, and then click the Properties button. In the resulting dialog box, click the Receive tab.

Middle: If you have only one phone line that your telephone shares, this note will appear every time a call comes in. Most of the time, you'll just answer the phone, and this message goes away. If you click it, though, your PC treats the call as an incoming fax.

Bottom: Once a fax is safely snuggled into your Fax Console program, this note lets you know.

EX 2009

- **Print it out.** If you like, you can direct Windows to print out each incoming fax, using the printer you specify here. Of course, doing so defeats the environmental and cost advantages of viewing your faxes on the screen, but at least you've got something you can hold in your hand.
- **Save a copy in a folder.** Ordinarily, incoming faxes are transferred to your Fax Console program, as described next. If you turn on this option, however, you can direct Windows to place a *duplicate* copy of each one—stored as a graphics file—in a folder of your choice. (Either way, it's handy to know that these are standard TIFF graphics files that you can email to somebody else—or even edit.)

To look at the faxes you've received, you must first launch the Fax Console program. You can get to it by choosing Start→All Programs→Accessories→Communications→Fax→Fax Console, but your fingers will be bloody stumps by the time you're finished mousing that deeply into the menu. Fortunately, once you've opened the program for the first time, it appears in the lower-left quadrant of your Start menu. From there, you can drag its name to a more convenient location, like the desktop, the Quick Launch toolbar, or the more permanent top *left* portion of your Start menu.

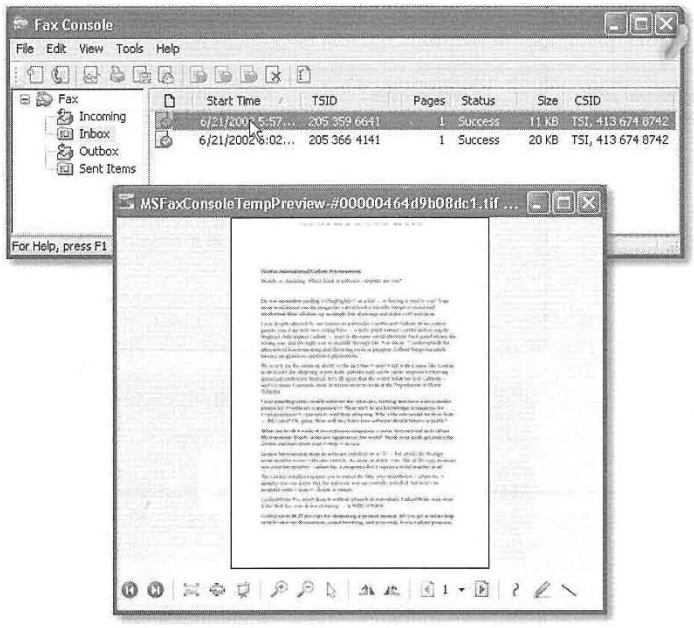


Figure 13-16:
Top: Until you delete them in Fax Console (by selecting them and then pressing the Delete key), your sent and received faxes stay here forever. Some of the toolbar buttons are useful, including Save (turns the fax into a graphics file on your hard drive) and Mail (sends the fax via email).

Bottom: Double-click a fax to open it into its own window. Click the little magnifying glass to enlarge your view, or just make the window bigger. Rotate it by clicking one of the two rotate buttons near the center of the toolbar. You can even add notes using the three tools on the far right side.

EX 2009

In any case, Fax Console looks something like an email program, as shown in Figure 13-16. Click the Inbox, for example, to see a list of faxes that have come in—and then double-click one to open it up (Figure 13-16, bottom).

Tip: Another great way to capitalize on the power of your PC for fax purposes is to sign up for J2 or eFax (*www.j2.com* and *www.efax.com*). These services issue you your own personal fax number. And here's the twist: All faxes sent to that number arrive at your PC as email attachments.

The brilliance of the system, of course, is that you don't need another phone line for this, and you can get these faxes anywhere in the world, even on the road. And here's the best part: As of this writing, both of these services are absolutely free. (You might consider reserving a separate email address just for your J2 or eFax account, however, since waves of junk mail are part of the "free" bargain.)

EX 2009

EX 2009

CHAPTER
14

Hardware

A PC contains several pounds of wires, slots, cards, and chips—enough hardware to open a TruValue store. Fortunately, you don't have to worry about making all of your PC's preinstalled components work together. In theory, at least, the PC maker did that part for you. (Unless you built the machine yourself, that is; in that case, best of luck.)

But adding *new* gear to your computer is another story. Hard drives, cameras, printers, scanners, network adapter cards, video cards, keyboards, monitors, game controllers, palmtop synchronization cradles, and other accessories can all make life worth living for the power user. When you introduce a new piece of equipment to the PC, you must hook it up and install its *driver,* the software that lets a new gadget talk to the rest of the PC.

UP TO SPEED

About Drivers

When a software program wants to communicate with your gear, Windows is the mediator. For example, when your word processor needs the printer, it says, "Yo, printer! Print this document, will ya?" Windows intercepts the message and gives the printer very specific instructions about printing, ejecting pages, making text bold, and so on. It speaks to the printer in "Printerese," a language it learns by consulting the printer's software driver.

Other hardware components work similarly, including sound cards, network interface cards (NICs), modems, scanners, and so on. All of them require specifically formatted instructions and driver software.

EX 2009

Fortunately, Microsoft has taken much of the headache out of such installation rituals by its invention of Plug and Play. This chapter guides you through using this feature—and counsels you on what to do when Plug and Play doesn't work.

Note: Chapter 13 contains additional hardware-installation details specific to printers.

The Master Compatibility List

Remember that Windows XP is based on Windows 2000. It's compatible with many more pieces of add-on equipment than Windows 2000 is, but nowhere near as broadly compatible as previous "home" versions of Windows (like Windows 98 and Windows Me). For anybody who's switching to Windows XP from an earlier version, discovering that a piece of equipment becomes flaky or nonfunctional is par for the course.

If you'd like to eliminate every glitch and every shred of troubleshooting inconvenience, limit your add-on gear to products on Microsoft's Hardware Compatibility List (HCL), which appears at *www.microsoft.com/hcl*. Each item on this list has been tested and certified to work flawlessly with Windows XP.

Now, this list doesn't include *everything* that works with Windows XP. Hundreds of products that work just fine with Windows XP don't appear on the list (perhaps because they haven't been submitted for Microsoft's certification process). If you have some cherished piece of gear that you're reluctant to replace and that doesn't appear on the compatibility list, try it out with Windows XP before giving up hope.

Tip: Many drivers that were certified for compatibility with Windows 2000 and Windows Me work with Windows XP. But if all you have for a particular gadget is Windows 98 (and earlier) driver software, you're probably out of luck.

Hardware Connections

Part of the installation process for a new piece of hardware is ensuring that it doesn't interfere with any of your *other* components (see the box on the facing page). Fortunately, Microsoft's Plug and Play technology is designed to avoid such conflicts.

Virtually every modern computer add-on is Plug and Play–compatible. (Look for a "Designed for Windows" logo on the box.) Chances are good that you'll live a long and happy life with Windows XP without ever having to lose a Saturday to manually configuring new gizmos you buy for it, as your forefathers did.

But gadgets that were designed before the invention of Plug and Play are another story. These so-called *legacy* devices often require manual configuration. Fortunately, Windows XP comes with wizards to walk you through this process, making it slightly less difficult.

EX 2009

Installing Cards in Expansion Slots

When installing a new piece of hardware, you either connect it to a *port* (a connector usually on the back of your computer) or insert it into an expansion slot on the *motherboard* (the computer's main circuit board).

Modems and adapter cards for video, sound, network cabling, disk drives, and tape drives, for example, generally take the form of circuit boards, or *cards*, that you install by inserting into an expansion slot inside your PC's case. These slots are connected to your PC's *bus*, an electrical conduit that connects all the components of the machine to the brains of the outfit: the processor and memory.

The two common (and mutually incompatible) kinds of slots are called *ISA* and *PCI*. The ISA bus (Industry Standard Architecture) has been around since the dawn of the PC in the early 1980s. PCI (Peripheral Component Interconnect) is comparatively new, and offers much better speed. Most of the computers in use today have both kinds of slots. There may be some museum pieces floating around that have only ISA slots inside; in fact some manufacturers have begun to eliminate ISA slots from their new computers, relying completely on PCI.

There's also a third type of slot in many of today's computers, called AGP (Accelerated Graphics Port). This slot is almost always occupied by a graphics card.

UP TO SPEED

Message Pathways

You're already familiar with one common routing system for messages: area codes and telephone numbers. Together, they pinpoint a unique location in the nation's telephone system.

To send instructional codes to your hardware, Windows needs a similar communication channel for each device. During installation, the operating system learns the location (phone number) of the hardware, plus the path (area code) its messages must take to arrive there.

But instead of area codes and phone numbers, PC components have unique channels called *IRQs* (Interrupt Request Lines), reserved areas of memory called *I/O addresses*, and other technical assignments that reserve their places in your system—or resources, as they're known in the geek business.

If your sound card occupies IRQ 11 and has an I/O address that starts at 6100, then Windows knows how to contact the card when your email software wants to play a "You've got mail" sound, for example. If your printer also occupied those addresses, the operating system would send a sound code, the printer would become confused ("What am I supposed to do with this instruction? It has nothing to do with printing!"), and the sound card might not receive the "Wake up and make the music" command. And it's not enough to set just a hardware component to the right channels; their *drivers* must be tuned to those same channels, too, if they're to communicate.

Clearly, Windows needs a traffic cop to ensure that each hardware gadget receives the correct messages. That's one of the functions of Plug and Play technology.

After you install a Plug and Play device and start your computer, the new component tells Windows: "Hi, I'm new here. Here's my species, here's my name, here are the resources I'd like to use if they're free. If they're not free, please assign resources, and let me know what they are so I can listen for my orders on the right channel."

EX 2009

Knowing the characteristics of the different bus types isn't especially important. What is important is knowing what type of slots your computer has free, so you can purchase the correct type of expansion card. To do this, you'll have to open your PC's case to see which type of slots are empty:

- The plastic wall around an ISA slot is usually black. It has metal pins or teeth in the center and a small crossbar about two-thirds of the way down the slot. On some older computers, there may be shorter-length ISA slots with no divider.
- The plastic wall around a PCI slot is usually white or off-white, and shorter than an ISA slot. A PCI slot has a metal center and a crossbar about three-quarters of the way along its length.

Installing a card usually involves removing a narrow plate (the *slot cover*) from the back panel of your PC, which allows the card's connector to peek through to the outside world. After unplugging the PC and touching something metal to discharge static, unwrap the card and carefully push it into its slot until it's fully seated.

Note: Depending on the type of card, you may have to insert one end first and then press the other end down with considerable force to get it into the slot. A friendly suggestion, however: Don't press so hard that you flex and crack the motherboard.

External Attachments

When you buy a printer, scanner, digital camera, or something else that plugs into connectors on the PC, you're actually buying a *peripheral,* in the lingo of PC magazines and clubs everywhere. Over the years, various engineering organizations have devised an almost silly number of different connectors for these peripherals (Figure 14-1 shows a typical assortment). The back panel—or front, or even side panel—of your PC may include any of these connector varieties:

- **FireWire port.** You probably don't have the special, rectangle-with-one-V-shaped-end jack unless you special-ordered it with your PC, but it's a winner nevertheless. (Various companies may also call it IEEE-1394 or i.Link.) It's an extremely high-speed connector that's *hot-pluggable,* meaning that you don't have to turn the computer off when connecting or disconnecting it. At the moment, what most people plug into a FireWire port are digital camcorders (for video editing), and external hard drives.
- **USB (Universal Serial Bus) port.** This compact, thin, rectangular connector accommodates a huge variety of USB gadgets: scanners, mice, keyboards, printers, palmtop cradles, digital cameras, Zip drives, and so on. Most modern PCs come with two or more USB ports, often on both the front and back panels. If that's not enough to handle all your USB devices, you can also attach a USB *hub* (with, for example, four or eight additional USB ports), in order to attach multiple USB devices simultaneously. USB is the most modern type of connector and therefore gaining in popularity; all USB devices are Plug and Play–compatible and hot-pluggable, and feature a faster connection than their older counterparts.

EX 2009

Note: Some USB gadgets (and some PCs) offer faster, enhanced connectors called USB 2. The original version of Windows XP couldn't recognize them, but thanks to software patches, it does now. (Automatic Updates, described on page 325, should download the necessary software automatically, or you can just install it using the installation disk that comes with your USB 2.0 appliances.)

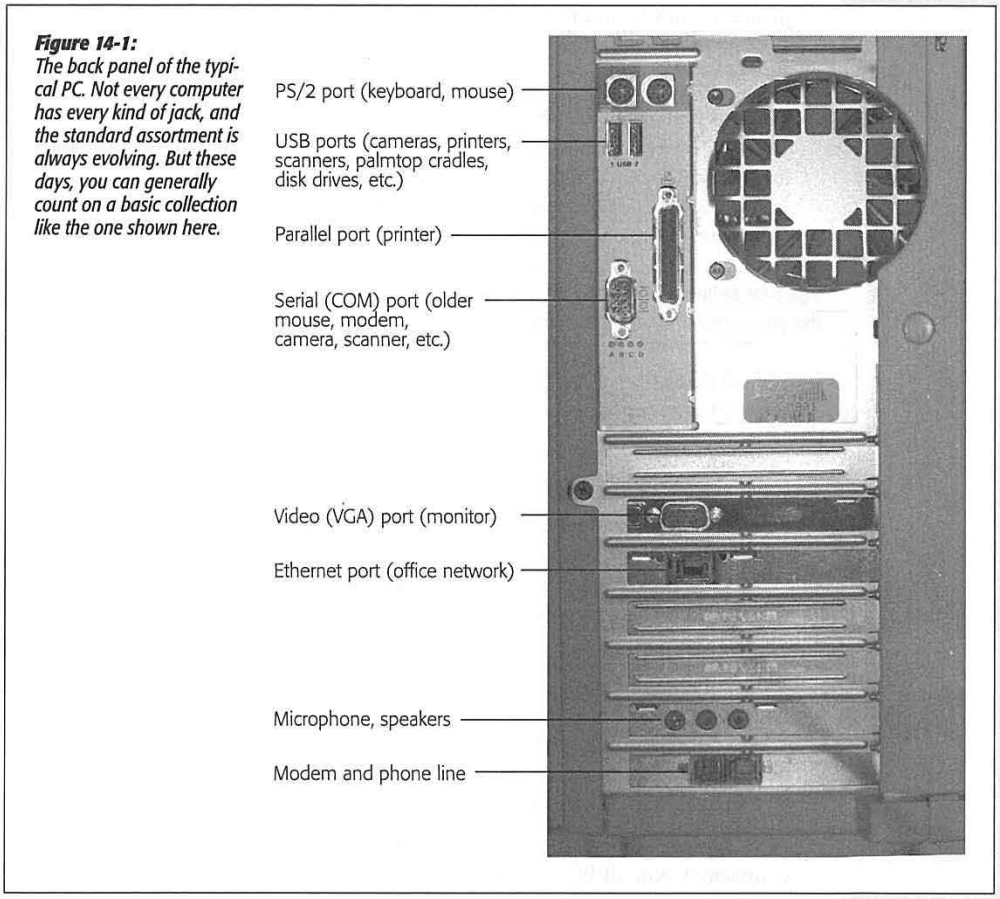


Figure 14-1: *The back panel of the typical PC. Not every computer has every kind of jack, and the standard assortment is always evolving. But these days, you can generally count on a basic collection like the one shown here.*

- **Bluetooth adapters.** Bluetooth is a fascinating new wireless technology. Don't think of it as a networking scheme—it's intended for the elimination of *cable clutter.* Once you've equipped your printer, PC, and Palm organizer with Bluetooth adapters, your computer can print to the printer, or HotSync with your Palm, from up to 30 feet away.

EX 2009

The original version of Windows XP didn't work with Bluetooth. But Microsoft added Bluetooth smarts to XP first in late 2002 (in the form of a software patch) and again in 2004 (as part of Service Pack 2).

- **Wireless (Infrared) port.** You'll find this kind of port most often on laptops. It lets your computer talk to similarly equipped gadgets (such as infrared-equipped printers, PalmPilots, and so on) through the air, via infrared or RF communication. An infrared port is a small, translucent plastic lens; RF ports look like little antennas.
- **PC card slot.** This kind of slot, too, is primarily found on laptops. It accommodates PC cards, which look like metal Visa cards. Each card adds a useful feature to your laptop: an Ethernet port, a modem, a wireless networking antenna, and so on. Expect this technology to be around for a while since there's currently no other alternative.

Tip: Because they're so new, *all* USB, FireWire, and PC card equipment is Plug and Play–compatible, meaning that you can install the necessary driver software simply by connecting a gadget to the PC.

- **Video (VGA) port.** A narrow female port with fifteen holes along three rows. Your monitor plugs in here.
- **Game Port.** This connector, which is usually part of a sound card, is a wide female port that accepts such gaming devices as joysticks and steering wheels.
- **SCSI port.** Here's another one that's fairly rare on everyday Windows workstation PCs (as opposed to industrial-strength *server* machines). You generally have an SCSI port only if it was installed as part of an add-on card. Unlike FireWire, though, its popularity is fading in the home market.

  SCSI is a high-speed internal and external bus that's more common on large servers than workstations. This kind of (there are various sizes and shapes) connector is designed to accommodate scanners, hard drives, CD-ROMs, magnetic tape drives, and so on. SCSI can be something of a diva technology, since setting up a chain of devices, connecting and disconnecting them, and configuring them correctly can be a fussy and temperamental business.
- **PS/2.** A small, round, female connector (known in PC circles as a *6-pin mini-DIN* connector). Not all PCs have PS/2 ports; but if yours does, it probably has two, one for the keyboard and the other for the mouse. As USB grows in popularity, these ports will vanish from new computers in the future.
- **Parallel (DB-25) port.** A wide female port with two rows of holes. It's usually connected to a printer (which is why it's sometimes called the printer port). You can plug some other kinds of equipment in here, including Zip or Jaz drives, tape drives, and other drives. Here again, parallel ports are dying out, having been replaced by the more popular (and much faster) USB ports.

EX 2009

- **Serial port.** A male connector with nine or 25 pins. It connects to a *serial device,* such as a mouse, modem, camera, scanner, or serial printer; it can also connect your PC to another one, port-to-port.

  Most computers have two serial ports, which are also called *COM* ports—but not for long. Serial ports, too, will probably also go the way of dinosaurs as USB ports take over the earth.

- **Keyboard port.** This round, 5-pin (DIN) female connector, similar to a PS/2 connector but larger, is becoming one of the rarest of all. It was designed to fit keyboards that don't use a PS/2 connection, and is yet another obsolete port in the USB era.

Connecting New Gadgets

In books, magazines, and online chatter about Windows, you'll frequently hear people talk about *installing* a new component. In many cases, they aren't talking about physically hooking it up to the PC—they're talking about installing its driver software.

The truth is that you generally have to install *both* the hardware and the software. The ritual goes like this:

1. **Run the installer on the setup disk, if one came with the new equipment.**

   That's right: Install the *software first.* Doing so copies the driver file to your hard drive, where Windows will be able to find it in the later steps of the installation.

2. **Physically connect the gadget.**

   That is, connect it to the inside or outside of the computer, according to the instructions that accompanied the equipment.

   The beauty of USB gadgets, FireWire gadgets, and PC cards is that they identify themselves to Windows XP the instant they're plugged in. For this kind of gizmo, there is no step 3.

   Other kinds of gear aren't so lucky. In general, you must turn off your PC before connecting or disconnecting components from other kinds of connectors. When you turn it on again (after hooking up the new gadget), Windows XP examines every connector, port, and slot on your machine, checking to see whether or not it's now occupied by a piece of equipment it hasn't seen before.

3. **Install the driver software into Windows.**

   If your new gear is Plug and Play–compatible (if its box bears a "Designed for Windows" logo, for example), then skip this step. The simple act of connecting the equipment inspires Windows to find the driver—either the one you copied to the drive in step 1, or one from its own database of drivers. (For *non*–Plug and Play gadgets, this step can require a considerable amount of effort, as described later in this chapter.)

EX 2009

Note: Windows XP comes with the driver software for thousands of different pieces of gear. It keeps many of these drivers, in compacted form, right there on your hard drive (in a file called Driver.cab). The Windows XP CD comes with hundreds of others.

All of these included drivers have been tested to work perfectly with Windows XP. Furthermore, Microsoft adds to this collection as new products appear, and sends you these new drivers via the Automatic Update feature described on page 325.

In either case, your gear is now completely installed—both its hardware and its software—and ready to use.

When Plug and Play Doesn't Work

If, when you connect a new component, Windows XP doesn't display a message like the one at top in Figure 14-2, it probably can't "see" your new device.

- If you've installed an internal card, make sure that it's seated in the slot firmly (after shutting down your computer, of course).
- If you attached something external, make sure that it has power and is correctly connected to the PC.

In either case, before panicking, try restarting the PC. If you still have no luck, try the Add New Hardware Wizard described in the next section. (And if even *that* doesn't work, call the manufacturer.)

If your new gadget didn't come with a disk (or maybe just a disk with drivers, but no installer), then hooking it up may produce the "Found New Hardware" balloon shown at top in Figure 14-2. Click the balloon to make the New Hardware Wizard appear (Figure 14-2, bottom). In that case, proceed like this:

- **If you have the drivers on a disk from the manufacturer.** Select the first option, "Install the software automatically," insert the driver disk if it's not already in the machine, and then click Next. Windows either finds the compatible driver and installs it automatically, or offers you a choice of several.

FREQUENTLY ASKED QUESTION

Using Manufacturer's Drivers for Plug and Play Devices

Windows XP finds my new Plug and Play device and installs it, but I don't want to use the Windows XP drivers. I have newer, better, drivers from the manufacturer. How can I stop the automated installation so I can use the better drivers?

You can't stop Plug and Play detection, but you *can* update the drivers after Windows XP has installed your new hardware. You do that in the Device Manager, described on page 443.

EX 2009

Tip: If you have drivers on a floppy, and this technique fails to find them, try the next option. The "Install from a list or specific location" option often works when the "Install the software automatically" choice doesn't.

- **If you've downloaded the driver from the Web.** Select the second option, "Install from a list or specific location," and click Next. You should now turn on both of the checkboxes shown in Figure 14-2, and then click the Browse button to navigate to, and select, the driver you downloaded.

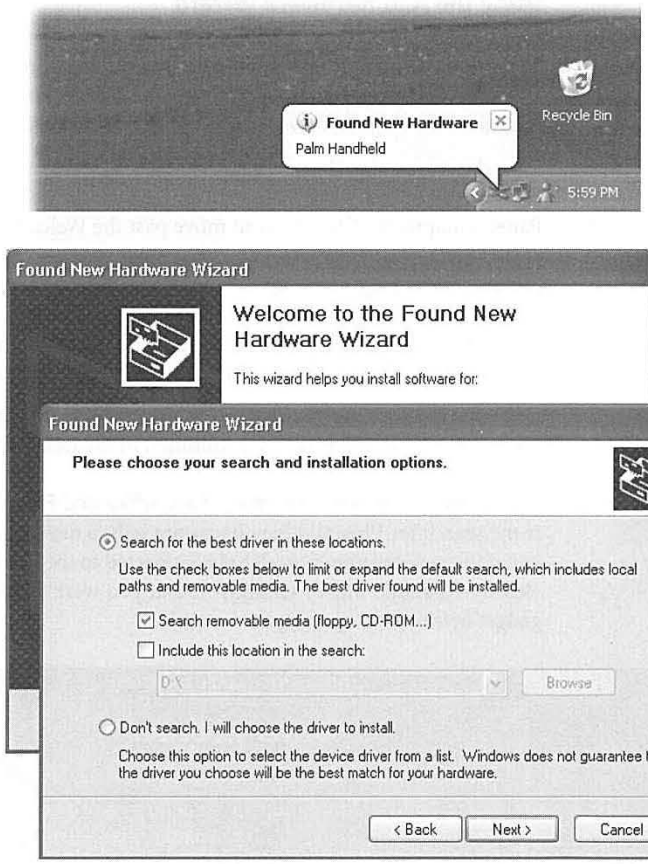


Figure 14-2:
Top: You're halfway home. Windows XP has at least acknowledged that you've plugged something in. Click the balloon to proceed with the software installation (if you didn't install the software first, as you should have).

Bottom: The Found New Hardware Wizard. You'll rarely use the bottom option, "Don't search. I will choose the driver to install." It's primarily used to override Windows XP's own, preinstalled driver in favor of another one—for example, one that came from the original manufacturer that you've been told offers more features than the official Microsoft driver.

EX 2009

Note: If you run the Found Hardware Wizard but don't, in fact, have drivers of any kind to feed it, Windows offers you the opportunity to register a kind of electronic complaint–something like an emailed record of your unsuccessful driver search.

As the first screen of the Get Help with Your Hardware Device Wizard makes clear, receiving help entails sending details of your PC and its configuration to Microsoft. If enough people agree to send in reports in this way, Microsoft will put pressure on the negligent manufacturer, in hopes of one day producing an XP-compatible driver that will be sent back to your PC automatically (via the Automatic Updates feature).

Using the Add Hardware Wizard

The Add Hardware Wizard fulfills some of the functions of the Found New Hardware Wizard, but comes in handy in different circumstances. You can use it whenever Windows fails to notice that you've blessed it with new components, for example, or to update the original driver when a better one becomes available.

Begin by connecting the new gear (turning off the computer first, if necessary). Turn the machine on again and then open the Add Hardware Wizard program in the Control Panel (Chapter 8). Click Next to move past the Welcome screen.

The search for Plug and Play

The first thing the wizard wants to do is search for a Plug and Play device. You already know that it won't find one—after all, if the hardware you're trying to install were Plug and Play–compatible, Windows XP would have found it already.

Unfortunately, you can't stop the Hardware Wizard juggernaut. You have no choice but to click Next and proceed as outlined in the next section.

Add Hardware Wizard searches for non–Plug and Play devices

If the search for Plug and Play hardware fails, a new wizard window opens and asks you if the new equipment is already connected to the PC. If you answer no, the wizard closes—its subtle way of telling you that you were supposed to have connected the gadget before even opening the wizard.

FREQUENTLY ASKED QUESTION

Driver vs. Driver

Which is better: the drivers that come with Windows XP, or the drivers I've downloaded from the manufacturer's Web site?

In many cases, they're the same thing. The drivers included with Windows XP usually did come from the hardware's manufacturer, which gave them to Microsoft for inclusion with Windows. However, you should still use the drivers that came from your gadget's manufacturer whenever possible, especially if you got them from the manufacturer's Web site. They're likely to be newer versions than the ones that came with Windows XP.

EX 2009

If you select "Yes, I have already connected the hardware," on the other hand, you're taken to a list of every component that's already in your computer (Figure 14-3). Scroll to the very bottom of the list and select "Add a new hardware device." Click Next.

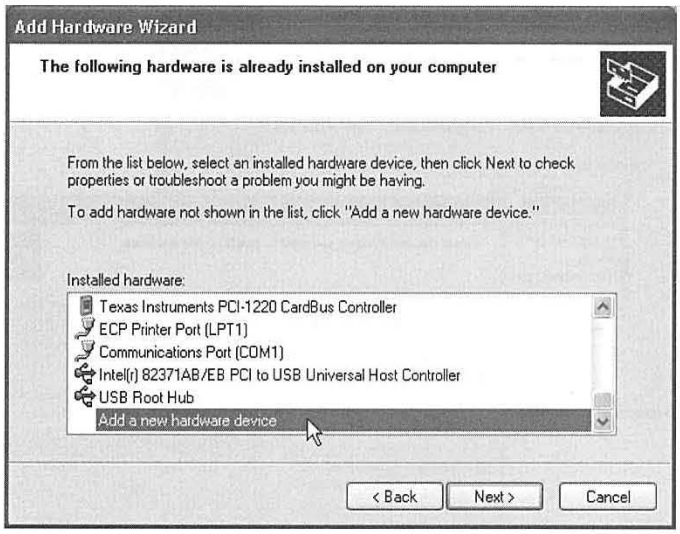


Figure 14-3: *Why does the wizard display a list of components you've already successfully installed? Because you can also use the Add Hardware Wizard to troubleshoot PC components you've already installed, using this very screen. Furthermore, Windows may have detected, but not precisely identified, something you've installed. For example, If you just installed a network adapter, and the list contains a generic Network Adapter entry with a question mark and a yellow ! circle, you can select it to install the correct driver.*

Now the wizard asks you to make yet another decision:

- **Search for and install the hardware automatically.** If you choose this option and click Next, Windows makes yet another attempt to detect the new equipment and install its driver. If a happy little "Found New Hardware" balloon appears in your notification area, all is well; the wizard's work is done.

  If the search succeeds, you've saved a couple of keystrokes; if it fails, you move on to the second option anyway.

- **Install the hardware that I manually select from a list.** If you choose this option and click Next (or if the previous option fails), the wizard displays a list of device types (top left in Figure 14-4). From that list, find and select the type of hardware you want to install—"Imaging devices" for a digital camera or a scanner, for example, "PCMCIA adapters" for a PC card, and so on. (Click Show All Devices if you can't figure out which category to choose.)

  Then click Next. Now Windows XP opens a two-paned window like the one shown at bottom in Figure 14-4.

  To complete the installation, click Next to forge on through the wizard pages. You may be asked to select a port or configure other settings. When you click the Finish

EX 2009

button on the last screen, Windows transfers the drivers to your hard drive. (Along the way, you may be instructed to insert the Windows XP installation CD.) As a final step, you may be asked to restart the PC.

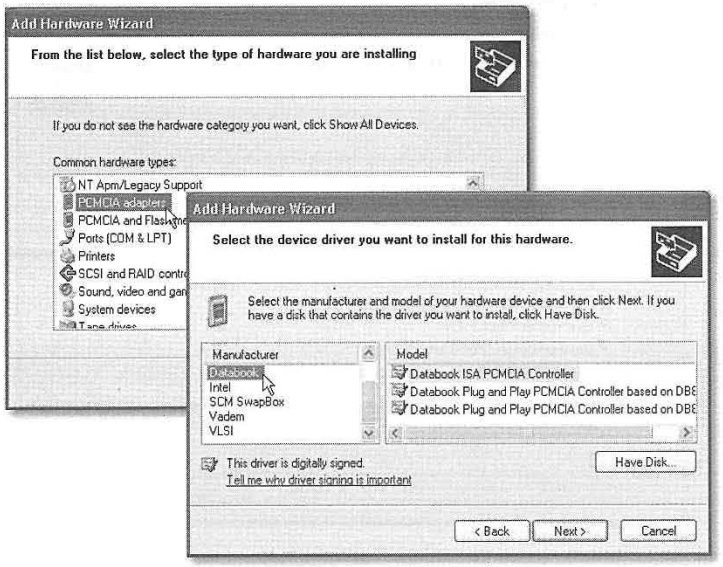


Figure 14-4: *Top left: Specify which kind of component you're adding.*

Bottom: Scroll down the left pane to find the name of your hardware manufacturer (in this case, a PC card is the hardware). The right pane of the window changes to display all the models the manufacturer offers, or at least the models that Windows XP knows about. If you can't find your model number, check the hardware's documentation to see if selecting one of the listed models would work just as well.

Driver Signing

Every now and then, when you try to install the software for one new gadget or another, you'll see the warning box shown in Figure 14-5. It's telling you that Microsoft has not tested this driver for Windows XP compatibility and programming solidity. (Technically speaking, Microsoft has not put its digital signature on that driver; it's an *unsigned driver.*)

If the message shown in Figure 14-5 appears before you, your first instinct should be to contact the manufacturer or its Web site to find out if a newer XP-certified driver is now available.

If not—for example, if the manufacturer has gone to that great dot-com in the sky—you may as well try to install the driver anyway. If it seems to make your system slower or less stable, you can always uninstall it, or rewind your entire operating system to its condition before you installed the questionable driver. (You would use System Restore for that purpose, which is described on page 451. Windows XP automatically takes a snapshot of your working system just before you install any unsigned driver.)

EX 2009

Tip: If you'd rather not contend with the "unsigned driver" message every time you install something, you can shut it up forever. Conversely, you can close up Windows like a vault, so that it will *never* accept unsigned drivers, for maximum, conservative safety. (Instead, you'll see a message declaring that the installation has been "blocked.") Instructions for setting up both scenarios are on page 290.

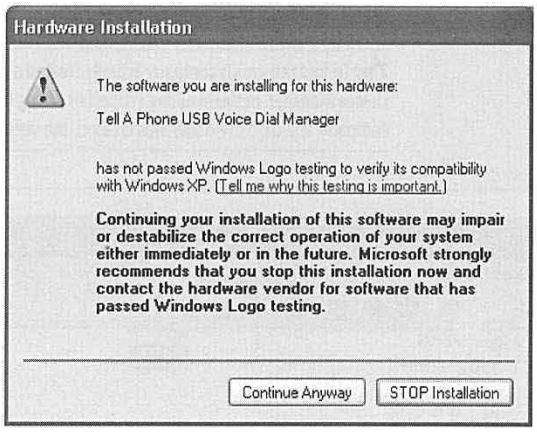


Figure 14-5:
The most stable and smoothly operating PC is one whose components use nothing but digitally signed drivers. On the other hand, just because a driver isn't signed doesn't mean it's no good; it may be that the manufacturer simply didn't pony up the testing fee required by Microsoft's Windows Hardware Quality Labs.

The Device Manager

The Device Manager is an extremely powerful tool that lets you troubleshoot and update drivers for gear you've already installed. It's a master list of every component that constitutes your PC: floppy drive, CD-ROM drive, keyboard, modem, and so on (Figure 14-6). It's also a status screen that lets you know which drivers are working properly, and which ones need some attention.

You can open the Device Manager in any of three ways:

- Right-click My Computer (in your Start menu or on the desktop); choose Properties from the shortcut menu. In the Systems Properties dialog box, click the Hardware tab, and then click the Device Manager button.
- Choose Start→Control Panel; open the System icon. Once again, click the Hardware tab to find the Device Manager button.
- Choose Start→Run. In the Run dialog box, type *devmgmt.msc* and press Enter.

In each of these cases, you now arrive at the screen shown in Figure 14-6.

Red X's and Yellow !'s: Resolving Conflicts

A yellow exclamation point next to the name indicates a problem with the device's driver. It could mean that either you or Windows XP installed the *wrong* driver, or that the device is fighting for resources being used by another component. It could

EX 2009

also mean that a driver can't find the equipment it's supposed to control. That's what happens to your Zip-drive driver, for example, if you've detached the Zip drive.

A red X next to a component's name, meanwhile, indicates that it just isn't working, or that you've deliberately disabled it, as described in a moment. At other times, the X is the result of a serious incompatibility between the component and your computer, or the component and Windows XP. In that case, a call to the manufacturer's help line is almost certainly in your future.

Tip: To find out which company actually created a certain driver, double-click the component's name in the Device Manager. In the resulting Properties dialog box, click the Driver tab, where you'll see the name of the company, the date the driver was created, the version of the driver, and so on.

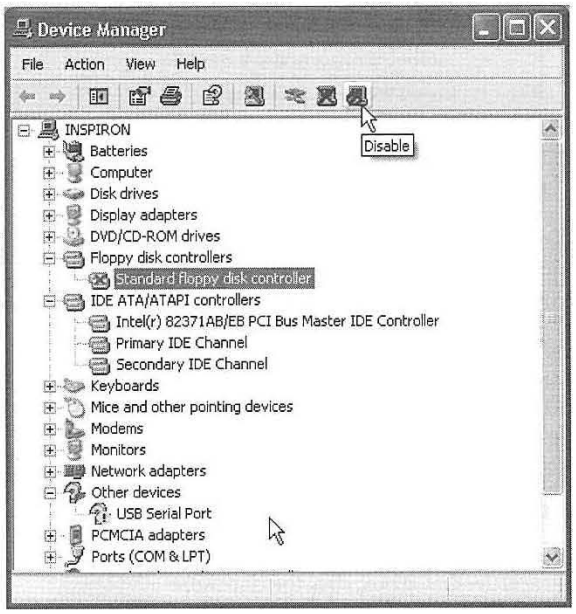


Figure 14-6: *The Device Manager lists types of equipment; to see the actual model(s) in each category, you must expand each sublist by clicking the + symbol. A device that's having problems is easy to spot, thanks to the red X's and yellow exclamation points.*

Duplicate devices

If the Device Manager displays icons for duplicate devices (for example, two modems), remove *both* of them. (Right-click each and then choose Uninstall from the shortcut menu.) If you remove only one, Windows XP will find it again the next time the PC starts up, and you'll have duplicate devices again.

If Windows XP asks if you want to restart your computer after you remove the first icon, click No, and then delete the second one. Windows XP won't ask again after you remove the second incarnation; you have to restart your computer manually.

EX 2009

When the PC starts up again, Windows finds the hardware device and installs it (only once this time). Open the Device Manager and make sure that there's only one of everything. If not, contact the manufacturer's help line.

Resolving resource conflicts

If the "red X" problem isn't caused by a duplicate component, double-click the component's name, and then click the Resources tab. Here you'll find an explanation of the problem, which is often a conflict in resources (see Figure 14-7).

Click the name of the resource that's having the conflict, and then click the Change Setting button. (If the Change Setting button is grayed out, turn off the "Use automatic settings" checkbox.)

Click the up/down control arrows next to the resource value, keeping an eye on the message in the Conflict Information box. When you select a value that has no conflict (as indicated by the Conflict Information box), move on to the next resource that indicates a conflict, and then click OK.

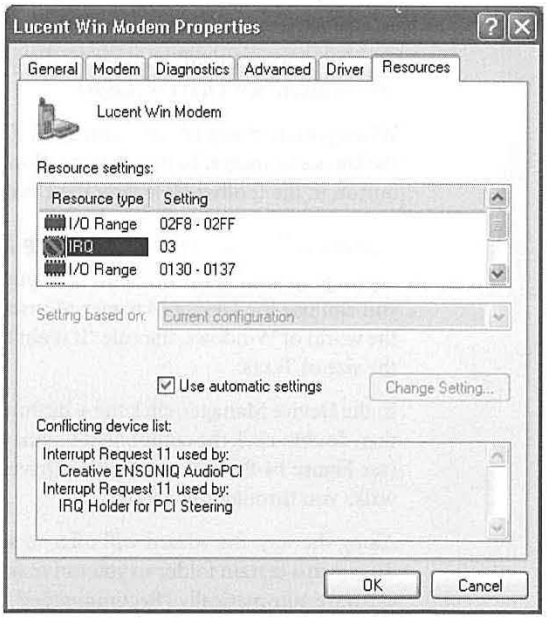


Figure 14-7: *The Resources tab should have all the information you need to resolve a problem. Any resource with a conflict is marked with a red X "not working" icon. Selecting a resource with a problem displays information about the conflict.*

EX 2009

Note: When Windows XP installs a Plug and Play device, it can modify the settings for both the device and its driver in order to find a combination that works. Windows might even have to reconfigure other devices in the computer, so that the new device can function properly.

But when you're working with a *non*–Plug and Play device, Device Manager can change the hardware settings only for the driver, not the device itself. In some cases, the driver may not be able to work with the device's settings. In these cases, you have to modify the settings of the hardware device itself using a program supplied by its manufacturer–or for really old gadgets, you'll have to flip jumpers or DIP switches right on the device itself.

Or just sell the whole thing and move to the Amish country.

Turning Components Off

If you click to select the name of a component, the icons at the top of the Device Manager window spring to life. The one on the far right is the Disable button (Figure 14-6), which makes your PC treat the component in question as though it's not even there. (You'll be asked to confirm your decision.)

This feature is mostly used to create *hardware profiles* (see page 447), but you can also use this function to test device conflicts. For example, if a red X indicates that there's a resource conflict, you can disable one of the two gadgets, which may clear up a problem with its competitor.

When you disable a component, a red X appears next to the component's listing in the Device Manager. To undo your action, click the device's name and click the Enable button in the toolbar (formerly the Disable button).

Updating Drivers with the Device Manager

If you get your hands on a new, more powerful (or more reliable) driver for a device, you can use the Device Manager to install it. Newer isn't *always* better, however; in the world of Windows, the rule "If it ain't broke, don't fix it" contains a grain of truth the size of Texas.

In the Device Manager, click the + button for the appropriate type of equipment, and then double-click the component's name to open its Properties box. On the Driver tab (see Figure 14-8), click the Update Driver button. The Update Device Driver Wizard walks you through the process.

Along the way, the wizard will offer to search for a better driver, or display a list of drivers in a certain folder so you can make your own selection. Ignore the "Install the software automatically (Recommended)" option; you *know* where the driver is, and it's faster to find it yourself. Select "Install from a list or specific location (Advanced)," and then click Next.

If the newer driver is on a disk, turn on the top checkbox ("Search removable media"), and then click Next. If you've downloaded it, turn on "Include this location in the search," and then click the Browse button to find and select it. In either case, you may have to restart the PC to put the newly installed driver into service.

EX 2009

Driver Rollback

Suppose that you, the increasingly proficient PC user, have indeed downloaded a new driver for some component—your scanner, say—and successfully installed it using the instructions in the previous paragraphs. Life is sweet—until you discover that your scanner won't scan except in black and white.

In this situation, you'd probably give quite a bit for the chance to return to the previous driver, which, though older, seemed to work better. That's the beauty of the Driver Rollback button. To find it, open the Device Manager (page 443), double-click the component in question, click the Driver tab in the resulting Properties dialog box, and then click the Roll Back Driver button (shown in Figure 14-8).

Windows XP, forgiving as always, instantly undoes the installation of the newer driver, and reinstates the previous driver.

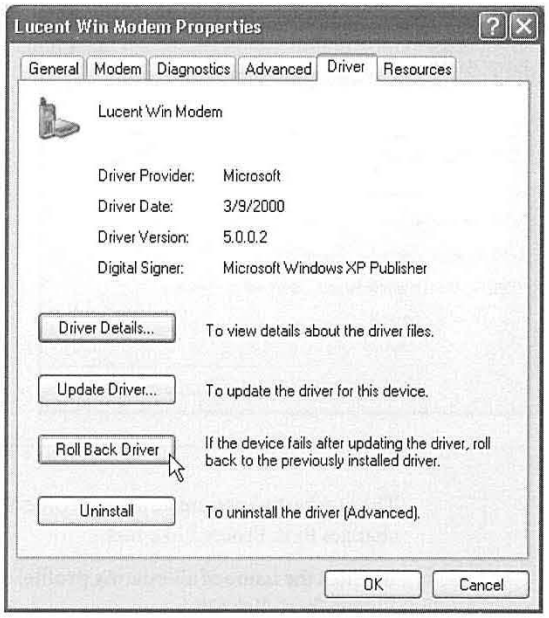


Figure 14-8:
When you double-click a component listed in your Device Manager and then click the Driver tab, you find four buttons and a lot of information. The Driver Provider information, for example, lets you know who is responsible for your current driver–Microsoft or the maker of the component. Click the Driver Details button to find out where on your hard drive the actual driver file is, the Update Driver button to install a newer version, the Roll Back Driver button to reinstate the earlier version, or the Uninstall button to remove the driver from your system entirely–a drastic decision.

Hardware Profiles

Hardware profiles are canned sets of settings for particular equipment configurations. By switching from one profile to another, you can quickly inform your computer that you've got a different assortment of gear connected—a feature that, as you can probably tell, is primarily useful for laptop owners.

EX 2009

If your laptop has a bay that can hold either a CD-ROM drive or a floppy drive, for example, you might create two hardware profiles, one for each of the drives. Or maybe you connect your laptop to a docking station at work; in that case, you could create one hardware profile for the equipment available on the docking station (including a monitor), and another hardware profile for use when you're undocked.

To create a hardware profile, open the System Properties dialog box (see page 288). Then click the Hardware tab, and click the Hardware Profiles button (see Figure 14-9).

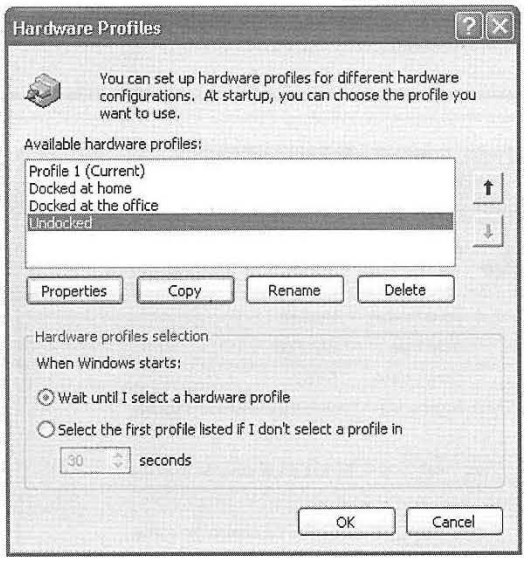


Figure 14-9:
Every computer is equipped with a hardware profile named Profile 1. Creating a new profile is simply a matter of copying the existing profile, creating a new name for the copy, and making changes to it. Use the option buttons at the bottom to specify how long you want Windows to display the menu of profiles at system startup time.

The quickest way to create a new profile is to duplicate an existing one, and then make changes to it. Proceed like this:

1. **Click the name of an existing profile, click the Copy button, name the new profile, and then click OK.**

   The new profile appears in the list shown in Figure 14-9.

2. **Click to select the new profile, and then click OK.**

   You return to the Hardware tab.

3. **Click the Device Manager button.**

   The Device Manager displays a list of all the various hardware gadgets you've installed into, or attached to, this machine.

EX 2009

4. Click the + symbol, and then the name of the component you want to turn on or off in this profile.

   The Disable button on the Device Manager toolbar becomes available.

5. Click the Disable button on the toolbar (see Figure 14-6). Click Yes when you're asked to confirm.

   After the Device Manager list collapses and expands, updating itself, you'll see a little red X on the icon of the component you've turned off. (That's what you'll see, that is, if the computer doesn't tell you that it first needs to be restarted.)

6. Repeat steps 4 and 5 for any other devices you'd like to enable or disable for this profile, and then click OK.

Hereafter, whenever you start your computer, you'll see, on a black, DOS-like screen, a list of the hardware profiles you've created. Only after you've selected one, following the instructions in Figure 14-10, does Windows XP finish its startup process.

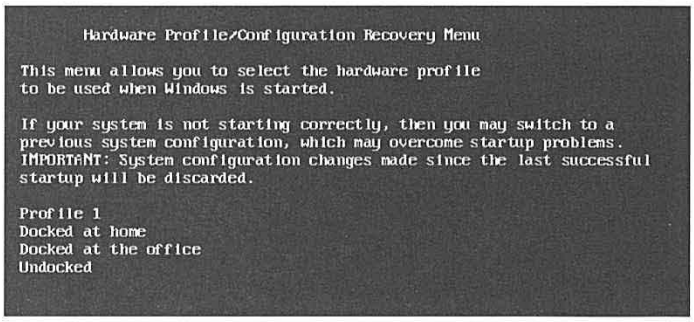


Figure 14-10: *Every time you turn on your Windows PC, you'll be shown this listing of hardware profiles. Highlight the profile you want by pressing the up and down arrow keys; press the Enter key when you've highlighted the one you want. Windows loads only the drivers for the hardware you've turned on in the selected profile.*

EX 2009

EX 2009

CHAPTER
15

Maintenance, Backups, and Troubleshooting

Like you, its human sidekick, your computer requires periodic checkups and preventive maintenance. Fortunately, Microsoft has put quite a bit of effort into equipping Windows XP with special tools, all dedicated to the preservation of what Microsoft calls PC Health. Here's a crash course in keeping your PC—and its hard drive—humming.

System Restore

As you get more proficient on a PC, pressing Ctrl+Z—the keyboard shortcut for Undo—eventually becomes an unconscious reflex. In fact, you can sometimes spot veteran Windows fans twitching their Ctrl+Z fingers even when they're not near the computer—after knocking over a cup of coffee, locking the car with the keys inside, or blurting out something inappropriate in a meeting.

Windows XP offers one feature in particular that you might think of as the mother of All Undo commands: System Restore. This feature alone can be worth hours of your time and hundreds of dollars in consultant fees.

The pattern of things going wrong in Windows usually works like this: The PC works fine for a while, and then suddenly—maybe for no apparent reason, but most often following an installation or configuration change—it goes on the fritz. At that point, wouldn't it be pleasant to be able to tell the computer: "Go back to the way you were yesterday, please"?

System Restore does exactly that: It "rewinds" your PC back to the condition it was in before you, or something you tried to install, messed it up.

EX 2009

Of course, some people will say that this is what backups are for. But System Restore isn't the same thing; it takes only your *operating system* back to its previous condition. It doesn't touch your email, Internet Explorer History or Favorites lists, Web cookies, files in your Windows→Downloaded Program Files folder, My Documents folder, or any standard document types (*.doc*, *.xls*, graphics files, and so on).

And besides: if you don't like your PC after restoring it, you can always restore it to the way it was *before* you restored it—back to the future.

Tip: If your PC manages to catch a virus, System Restore can even rewind it to a time before the infection–sometimes. Unfortunately, you can't count on your PC having that function. By the time you discover it, the virus may have infected your documents, which System Restore doesn't touch. An up-to-date antivirus program is a much more effective security blanket.

About Restore Points

System Restore works by taking snapshots of your operating system. In fact, your copy of Windows XP has been creating these memorized snapshots, called *restore points*, ever since you've been running it. When the worst comes to pass, and your PC starts acting up, you can use the System Restore calendar (see Figure 15-2) to rewind your machine to its configuration the last time you remember it working well.

As Figure 15-2 illustrates, Windows XP automatically creates landing points for your little PC time machine at the following times:

- The first time you boot up Windows XP.
- After every 10 hours of operation.
- After every 24 hours of real-world time (unless your PC is turned off all day; then you get a restore point the next time it's turned on).
- Every time you install a new program (provided it uses a recent version of the Microsoft Windows Installer or InstallShield).
- Every time the Automatic Update feature (see page 325) updates a component of your operating system.
- Whenever you feel like it—for instance, just before you install some new component. (To create one of these *manual* checkpoints, choose Start→Help and Support. Click "Undo changes to your computer with System Restore." On the next screen, click "Create a restore point," and then click Next; name your new checkpoint and click OK.)

Note: When your hard drive is running low on space, System Restore turns off automatically, without notice. It turns itself back on when you free up some space.

As you can well imagine, storing all of these copies of your Windows configuration consumes quite a bit of disk space, especially since the factory setting for the amount

EX 2009

of space that System Restore can use is 12 percent of every hard drive. That adds up quickly—on a 60 GB hard drive, that's 7.2 GB.

Fortunately, you can control exactly how much disk space is dedicated to this function—or turn the function off entirely—as described in Figure 15-1. (Note that turning off System Restore, even momentarily, wipes out all existing restore points.)

Tip: Ever wonder where Windows is storing this backup copy of your operating system? It's in a folder called System Volume Information that sits in your Local Disk (C:) window. Inside are individual folders for each restore point. (System Volume Information is generally an invisible folder, but you can make it visible following the instructions on page 80. You still won't be allowed to move, rename, or delete it, however—thank goodness.)

That's why Windows XP automatically begins *deleting* restore points after 90 days (or when it's running out of disk space)—as well as any chance of rewinding your system back that far. That's also why the System Restore feature stops working if your hard drive is very full.

And that's *also* why you should run the System Restore feature promptly when your PC acts strangely.

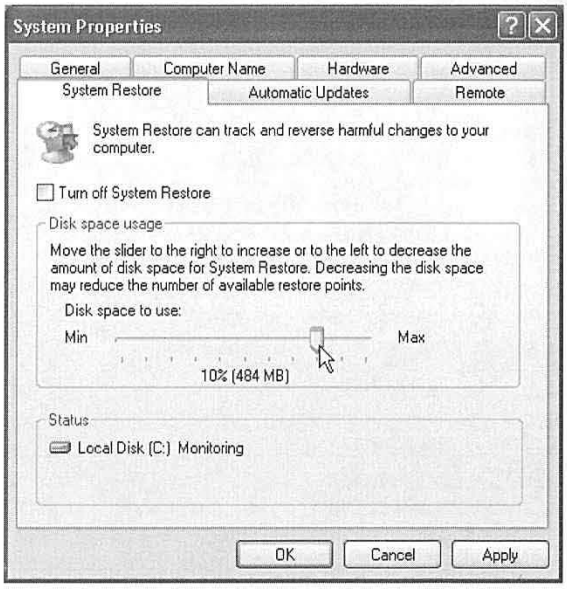


Figure 15-1:
To specify how much disk space System Restore is allowed to use (and therefore how many "rolling back" opportunities you have), open the System program in Control Panel. Click the System Restore tab, and then drag the slider to change the amount of disk space you're willing to sacrifice for this feature. (If you have several hard drives, you get a Settings button that lets you individually change the limit–or turn off System Restore–for each.) Click Apply and then OK.

EX 2009

Tip: When you value hard drive space more than the opportunity to return your PC to a distant moment of health, you can use an obscure button (Figure 15-3), to delete all but the *most recent* system restore point. To get there, choose Start→All Programs→Accessories→System Tools→Disk Cleanup. Click the More Options tab, and then click the "Clean up" button in the System Restore section.

Performing a System Restore

If something goes wrong with your PC, here's how to roll it back to the happy, bygone days of late last week:

1. **Choose Start→Help and Support.**

   The Help center appears.

2. **Click "Undo changes to your computer with System Restore." On the next screen, confirm that "Restore my computer to an earlier time" is selected, and then click Next.**

   Now you see the System Restore calendar (Figure 15-2). The calendar squares containing boldface numbers indicate the days on which Windows memorized your operating system condition.

GEM IN THE ROUGH

Automatic System-File Replacement

One of Windows XP's best PC-health features has no control panel, no window, and no icon of its own. It's a behind-the-scenes, automatic feature that may have already saved your PC's hide a time or two without your knowledge. It's System File Protection.

Ordinarily, you can't see the icons of extremely important Windows system files. Years of calls to Microsoft's help center have taught the company to keep these files hidden from the inexperienced, the curious, and the mischievous.

But if you make these files visible again (see page 80) *and* drag one of the vital files in the Local Disk (C:)→Windows folder to the Recycle Bin, you won't even get the satisfaction of seeing your machine crash. Instead, even before you can close and open the Windows folder again, the operating system replaces the deleted system file with a perfect, fresh copy.

This feature also solves the age-old "My-application's-installer-replaced-an-important-system-file-with-an-older-version-and-now-nothing-works!" snafu. Simply put, Windows XP won't allow an application to replace a Windows XP file with an older version. True, this means that some older programs won't run—but better to do without them than your entire PC.

Incidentally, Windows XP uses a similar technique to keep your system updated with *Service Pack* files. (Service Packs are periodic updates that Microsoft releases to address problems in the operating system.)

In the old days of Windows NT, if you installed some new operating system feature after installing a Service Pack, you had to install the Service Pack again to ensure that the new feature was using all the latest files. Windows XP saves you this hassle by storing the Service Pack files right on your hard drive. Whenever applications need new versions of the operating system files, Windows installs them automatically, using the downloaded Service Pack files for reference.

EX 2009

3. **Click the boldface calendar square closest to the last day you remember your PC working correctly.**

   Now you see, in the right pane, the restore points that were created on that day, complete with a description.

4. **Click one of the checkpoints listed on the right side, and then click Next.**

   You're now warned to close all your documents and programs. Right-click each window button on your taskbar (except the System Restore button, of course), choosing Close from each shortcut menu until System Restore is the only program left running.

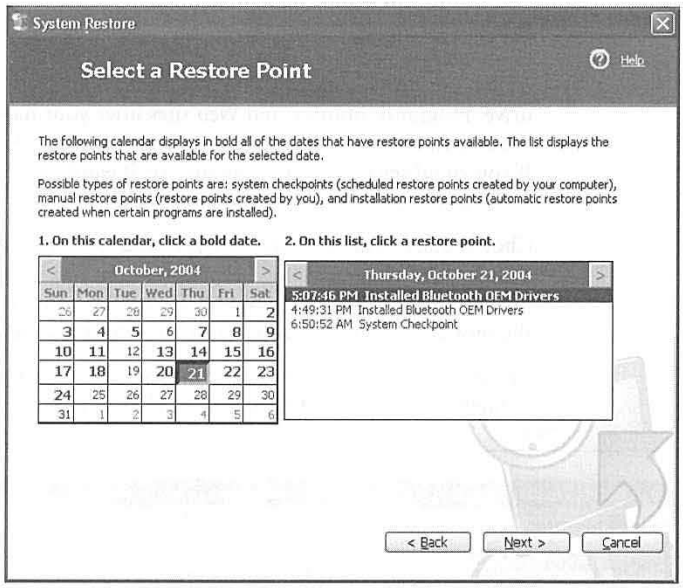


Figure 15-2:
Top: To change the month, click the < or > button at either end of the calendar. When you click a calendar square containing a bold number, the pane on the right shows the restoration points available for that date. You may find "Manual Checkpoint," which is one that you created yourself; "System Checkpoint," which is one that Windows XP created automatically (a "just in case" restore point); "Update to an unsigned driver," which means you installed software that Microsoft hasn't inspected (as described on page 442); "Automatic Updates Install," which is a Windows patch that XP downloaded and that you approved for installation; and so on.

Bottom: After a restart, you're back in business. This message reminds you that you can even rewind the rewinding, if it didn't produce the results you were seeking.

EX 2009

5. Click Next.

Now Windows goes to town, reinstating your operating system to reflect its condition on the date you specified. Leave your PC alone while this occurs.

When the process is complete, the computer restarts automatically, and the message shown in Figure 15-2 (bottom) appears. Welcome back to the past.

Tip: If rewinding your system to the golden days actually makes matters worse, you can always reverse the entire Restore process. To do so, open Start→Help and Support again. Once again, click "Undo changes to your computer with System Restore"—but this time, select "Undo my last Restoration." Click Next, click OK, click Next, and wait for the process to reverse itself.

Disk Cleanup

As you use your computer, Windows places numerous temporary files on your hard drive. Programs, utilities, and Web sites litter your hard drive with disposable files. Trouble is, Windows doesn't always clean them up when they're no longer needed. If you could see your hard drive surface, it would eventually look like the floor of a minivan whose owners eat a lot of fast food.

Choose Start→All Programs→Accessories→System Tools→Disk Cleanup to open Windows XP's built-in housekeeper program. (Or, if you find it faster, right-click the icon for your hard drive in your My Computer window, and choose Properties from the shortcut menu. Then, on the General tab, click the Disk Cleanup button.)

The program dives right in, inspecting your drive and reporting on files you can safely remove (Figure 15-3). It's like getting a bigger hard drive for free.

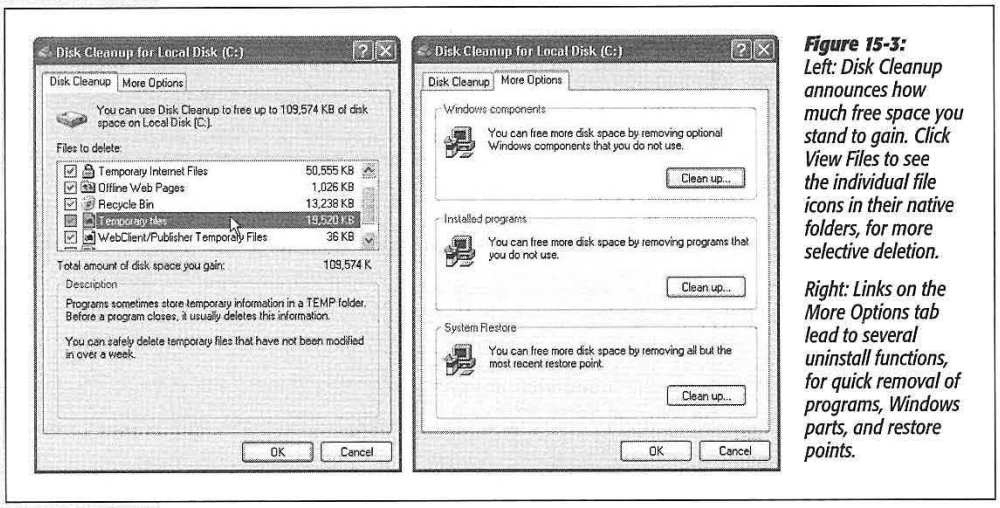


Figure 15-3: *Left: Disk Cleanup announces how much free space you stand to gain. Click View Files to see the individual file icons in their native folders, for more selective deletion.*

Right: Links on the More Options tab lead to several uninstall functions, for quick removal of programs, Windows parts, and restore points.

EX 2009

Start by selecting the drive you want to clean, and then wait while Disk Cleanup examines various files. The Disk Cleanup dialog box shown in Figure 15-3 (at left) appears when the inspection is over. Turn on the checkboxes of the file categories you'd like to have cleaned, and then click OK to send them to the digital landfill.

Tip: The More Options tab of this dialog box (Figure 15-3, right) provides links to three other Cleanup programs of Windows XP. Its three "Clean up" buttons take you to the Add or Remove Windows Components window (which lets you delete Windows modules you don't use), the main Add and Remove Programs window (which reveals which programs you haven't used in a while) and a confirmation box that lets you delete all but the latest *restore point,* described earlier in this chapter.

Disk Defragmenter

When you save a new file, Windows records its information onto the hard drive in small pieces called *blocks*. On a new PC, Windows lays the blocks end-to-end on the hard drive surface. Later, when you type more data into a document (thus enlarging it), the file no longer fits in the same space. Windows XP puts as much of the file in the original location as can fit, but may have to store a few of its blocks in the next empty spot on the hard drive.

Ordinarily, you'll never even notice that your files are getting chopped up in this way, since they open promptly and seamlessly. Windows keeps track of where it has stored the various pieces, and reconstitutes them when necessary.

As your drive fills up, the free space that's left is made up of smaller and smaller groups of blocks. Eventually, a new file may not fit in a single "parking place" on the hard drive surface, since there are no free spaces left that are large enough to hold it. In fact, Windows may have to store a file in several different areas of the disk, or even hundreds.

When you later try to open such a *fragmented* file, the drive heads (which read the disk) must scamper all over the disk surface, rounding up each block in turn, which is slower than reading contiguous blocks one after the other. Over time, this *file fragmentation* gets worse and worse and may eventually result in noticeable slowdowns when you open or save files.

The solution: Disk Defragmenter, a program that puts together pieces of files that have become fragmented (split into pieces) on your drive. The "defragger" also rearranges the files on your drives to make the operating system and programs load more quickly. Although Disk Defragmenter takes some time to do its thing, a freshly defragged PC feels faster and more responsive than a heavily fragmented one.

Tip: Fragmentation doesn't become noticeable except on hard drives that have been very full for quite a while. Don't bother defragmenting your drive unless you've actually noticed it slowing down. The time you'll spend waiting for Disk Defragmenter to do its job is much longer than the fractions of seconds caused by a little bit of file fragmentation.

EX 2009

Defragmenting a Drive

Before you run Disk Defragmenter, exit all programs, disable your antivirus software, empty the Recycle Bin, and plan some time away from the PC—remember, defragging is time-consuming. Depending on the size of your drive, the number of files on it, how fragmented it is, and especially how much free space is available, the Disk Defragmenter can take all day to run.

Defragmenting also puts your hard drive into a temporarily delicate condition. Therefore, don't defragment if your hard drive is ailing, if there's a thunderstorm, when your laptop is running on battery, or when you've set up the Task Scheduler (see page 467) to trigger automatic tasks.

Tip: During the defragmentation process, Windows picks up pieces of your files and temporarily sets them down in a different spot, like somebody trying to solve a jigsaw puzzle. If your hard drive is very full, defragmenting will take a lot longer than if you have some empty space available–and if there's less than fifteen percent free, Windows can't do the job completely. Before you run Disk Defragmenter, then, use Disk Cleanup and make as much free disk space as possible.

To open the Disk Defragmenter program, log on using an Administrator account (page 492), and then use any of these techniques:

- Choose Start→All Programs→Accessories→System Tools→Disk Defragmenter.
- Choose Start→My Computer. Right-click the icon of a hard drive; from the shortcut menu, choose Properties. In the Properties window, click the Tools tab, and then click Defragment Now.
- Choose Start→Run. Type *dfrg.msc* and press Enter.

Tip: Throughout Windows, and throughout its book and magazine literature, disks are referred to as *volumes*. Usually, volume means disk. But technically, it refers to *anything with its own disk icon* in the My Computer window–including disk *partitions* (page 464), Zip disks, DVDs, and so on.

The Disk Defragmenter window opens, listing your hard drives.

1. **Click the drive you want to work on.**

   Unless you have multiple hard drives, the C: drive is already selected.

2. **Click Analyze.**

   The program takes a minute to study the condition of the files on your hard drive. If, in its considered opinion, defragmenting is worth the time and effort, a message will tell you so (see Figure 15-4).

3. **Click Defragment.**

   Disk Defragmenter works by juggling file segments, lifting some into memory and depositing them elsewhere on the drive, then moving smaller files into the newly created free space. This shuffling process goes on for some time, as file fragments and whole files are moved around until every file lies on the drive in one piece.

EX 2009

Technically, in fact, Defragmenter doesn't rejoin file fragments randomly. In restoring them, Disk Defragmenter tries to organize the files better on the hard drive surface, using logic to position them so that applications will open up as quickly as possible.

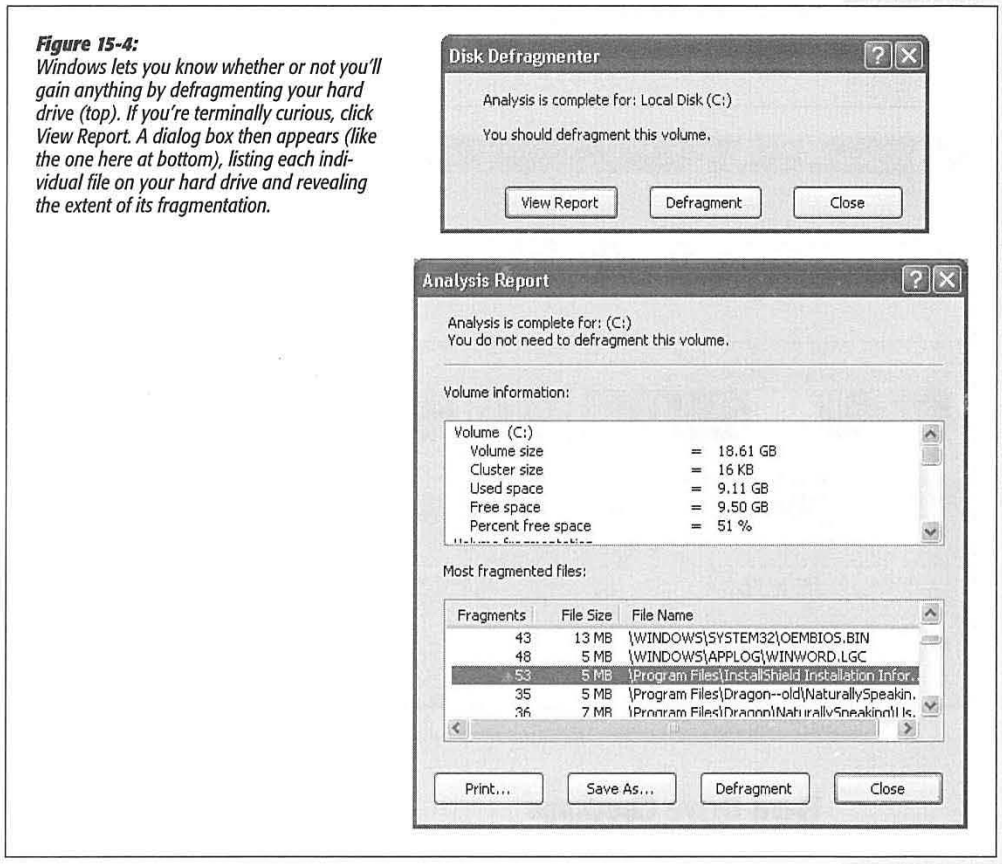


Figure 15-4:
Windows lets you know whether or not you'll gain anything by defragmenting your hard drive (top). If you're terminally curious, click View Report. A dialog box then appears (like the one here at bottom), listing each individual file on your hard drive and revealing the extent of its fragmentation.

A progress bar at the bottom of the window lets you know how far along it is. You can wander away to watch TV—or, if you're fascinated by this kind of thing, you can watch the colorful graphs (Figure 15-5).

For best results, leave your PC alone while the defragmenting process is going on. If you absolutely must perform a task at your computer during the defragging process, click Pause.

If you save a file while the drive is being defragmented (whether you pause the program or not), Disk Defragmenter starts the process over from the beginning.

EX 2009

Note: Disk Defragmenter isn't the only tool for this job. Programs like Norton Utilities include additional features. For example, because they track how often you use the various files on your drive, they can store the most frequently used files at the beginning of the disk for quicker access. In some programs, you can even *choose* which files go at the beginning of the disk.

Do these additional features actually produce a measurable improvement over Windows XP's built-in defragger? That's hard to say, especially when you remember the biggest advantage of Disk Defragmenter: it's free.

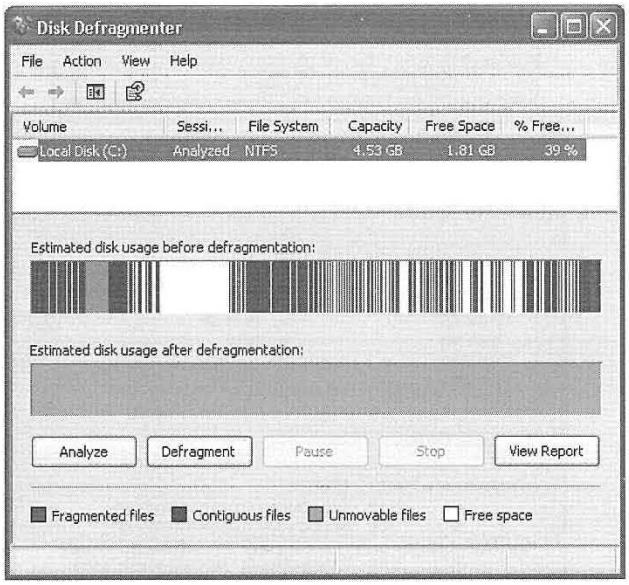


Figure 15-5:
A detailed view of the defragmentation process helps you understand what Disk Defragmenter is doing. The color of each little square shows what's going on, as the program juggles software files, system files, and data files to put each file in the best possible place. At that point of perfection, Disk Defragmenter announces victory over fragmentation and asks if you want to close the program. Say Yes unless you have another hard drive that needs defragging.

Hard Drive Checkups

Every time you shut down the computer, Windows tidies up, ensuring all files are saved properly on the drive. When all is well, Windows turns off the machine (or, on older computers, displays a message on your screen telling you it's OK to shut off your computer manually). The time that elapses between your Turn Off Computer command and the actual power-down moment is the "tidying up" period.

But sometimes, thanks to a system crash, power outage, or toddler playing with your surge suppressor, your computer gets turned off without warning—and without the usual shutdown checks. In the days before Windows XP, restarting the PC after such a *dirty shutdown* would automatically run a program called ScanDisk, a utility

EX 2009

designed to detect and, when possible, repair drive damage that may have occurred as a result of an improper shutdown.

ScanDisk doesn't exist in Windows XP, but its functions have been reincarnated. You get to this feature by right-clicking the icon of the hard drive you want to check (in the My Computer window). From the shortcut menu, choose Properties; click the Tools tab, and click Check Now (Figure 15-6, top).

Note: Geeks fondly refer to the feature described here as *chkdsk* (apparently named by someone with no vowels on his keyboard). You can also get to it by choosing Start→Run, typing *chkdsk*, and pressing Enter. But the method described here is much better-looking.

As shown in the middle of Figure 15-6, a box appears, offering two options:

- **Automatically fix file system errors.** Clearly, you want this option turned on, so that any problems Windows finds are taken care of automatically. If you're checking the system drive (the drive on which Windows XP is installed), you'll see the dialog box shown at bottom in Figure 15-6. Click Yes to defer the actual scan until the next time you restart the computer. (Other drives get scanned immediately.)
- **Scan for and attempt recovery of bad sectors.** If you turn on this option, whenever the scan finds a damaged section of a drive, it'll move any files located there elsewhere on the drive. Then the program surrounds that hard-disk area with the digital equivalent of a yellow "Police Line—Do Not Cross" tape, so that Windows won't use the damaged area for storing files in the future.

FREQUENTLY ASKED QUESTION

When Good Drives Go Bad

I was surprised when the Check Disk dialog box found some problems with my hard drive. I don't understand what could have gone wrong. I treat my PC with respect, talk to it often, and never take it swimming. Why did my hard drive get flaky?

All kinds of things can cause problems with your hard drive, but the most common are low voltage, power outages, voltage spikes, and mechanical problems with the drive controller or the drive itself.

An inexpensive gadget called a *line conditioner* (sold at computer stores) can solve the low-voltage problem. A more expensive gizmo known as an *Uninterruptible Power Supply* (UPS) maintains enough backup battery power to keep your computer going when the power goes out completely—for a few minutes, anyway, so that you can shut down the computer properly. The more expensive models have line conditioning built in. A UPS is also the answer to power outages, if they're common in your area.

Voltage spikes are the most dangerous to your PC. They frequently occur during the first seconds when the power comes back on after a power failure. A surge suppressor is the logical defense here. But remember that the very cheap devices often sold as surge suppressors are actually little more than extension cords. Furthermore, some of the models that do provide adequate protection are designed to sacrifice themselves in battle. After a spike, you may have to replace them.

If you care about your computer (or at least about the money you spent on it), buy a good surge suppressor, at the very least. The best ones come with a guarantee that the company will replace your equipment (up to a certain dollar value) if the unit fails to provide adequate protection.

EX 2009

Before you begin the scan, quit all other open programs; otherwise, Windows will report that it was "unable" to complete the scan. Finally, click the Start button in the Check Disk dialog box to begin the scan. When all phases of the check are complete ("Phase 1, Phase 2"...), a dialog box lets you know how things turned out.

Note: If you elected to format your hard drive with the *NTFS file system,* described on page 462, you'll find hard-drive glitches fixable by ScanDisk and its descendant to be extremely rare, because NTFS drives are designed to be self-repairing.

If you still use the *FAT 32* formatting scheme, however, it's a good idea to perform this kind of check once every few months, so that it can check your hard drive for any nascent problems.

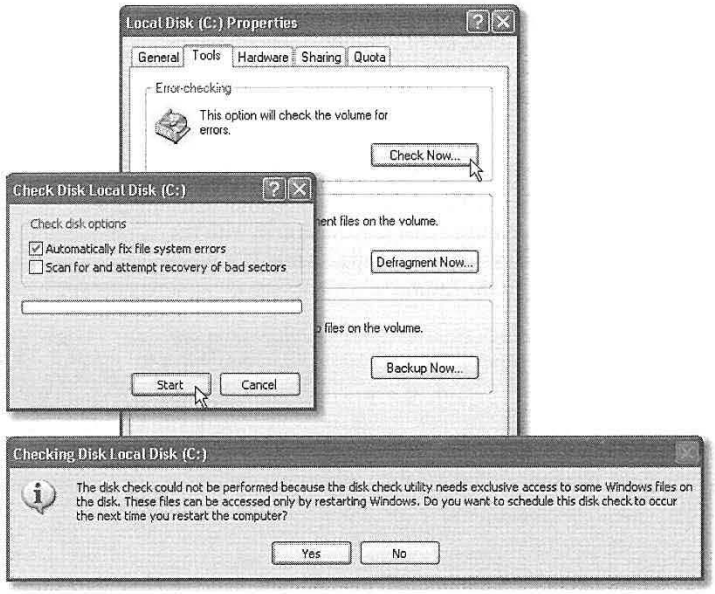


Figure 15-6:
Top: Click Check Now in the Properties dialog box for your hard drive.

Middle: Click Start to begin the scan, which checks the file structure, folders, files, and other elements on your drive.

Bottom: You may be asked to restart the PC, so that the Son of ScanDisk can do its thing during the startup process. If you click Yes, nothing seems to happen at all. Windows is just holding its breath until you actually restart. During the lengthy procedure, onscreen messages serve up status reports. When it's over, the computer restarts.

Disk Management

"Disk management" isn't just a cool, professional-sounding skill—it's the name of yet another built-in Windows XP maintenance program, one that may be familiar to Windows 2000 veterans, but is completely new to people who are used to Windows Me and its predecessors.

To open this technical database of information about your disks and drives, you can use any of three methods:

EX 2009

- Choose Start→Control Panel→Administrative Tools→Computer Management. In the resulting Computer Management window, double-click Disk Management in the list at the left side.
- In the Start menu, right-click My Computer. From the shortcut menu, choose Manage. Once again, double-click Disk Management in the list at the left side.
- Choose Start→Run; type *diskmgmt.msc* and press Enter.

In any case, you arrive at the window shown in Figure 15-7. At first glance, it appears to be nothing more than a table of every disk (and *partition* of every disk) currently connected to your PC. The Disk Management window is a software toolkit that lets you *operate* on these drives, too. Now, none of the following recipes are what you'd call everyday tasks. But for the power user who wants to take control of the spinning platters inside or connected to the PC, here are some of the joys that lie ahead.

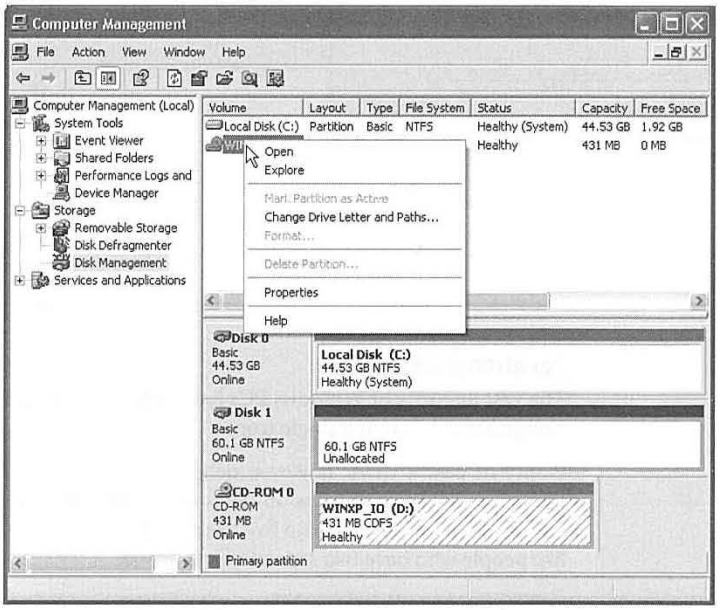


Figure 15-7: *The Drive Management window is part of the much bigger, much more technical entity known as the Computer Management console. You access it by clicking Disk Management (in the left-side pane). Then you can operate on your drives by right-clicking them. Don't miss the View menu, by the way, which lets you change either the top or the bottom display. For example, you can make them display all of your* disks *instead of your* volumes *(there's a difference).*

Change a Drive Letter

As you've probably noticed, Windows assigns a drive letter to each disk drive associated with your PC. The floppy disk drive is always A:, the primary internal hard drive is generally C:, and so on. Among other places, you see these letters in parentheses following the names of your drives, as when you choose Start→My Computer.

EX 2009

Windows generally assigns these letters in the order that you install new drives to your system. You're not allowed to change the drive letter of your floppy drive or primary hard drive (usually the C: drive). You can, however, override the standard, unimaginative Windows letter assignments easily enough, as shown in Figure 15-8.

Note: If Windows XP is currently using files on the disk whose drive letter you're trying to change, Disk Management might create the new drive letter assignment but leave the old one intact until the next time you restart the computer. This is an effort not to pull the rug out from under any open files.

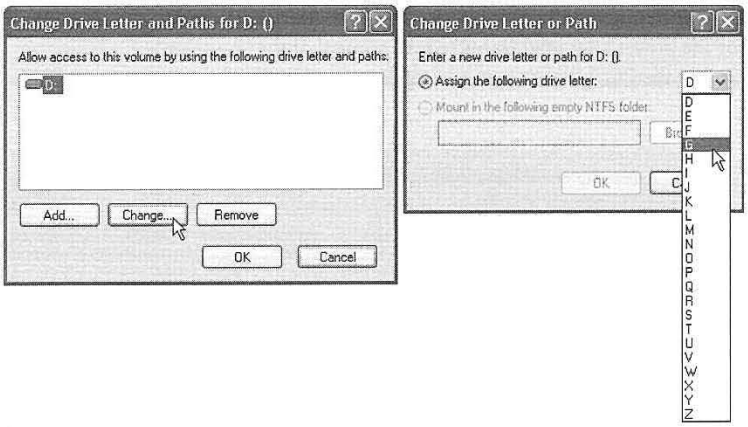


Figure 15-8: *Right-click a drive icon as shown in Figure 15-7. From the shortcut menu, choose Change Drive Letter and Paths.*

Left: In this dialog box, click Change.

Right: Then choose a letter that hasn't already been assigned. Click OK, and then approve your action in the confirmation box.

Partition a New Drive

The vast majority of Windows PCs have only one hard drive, represented in the My Computer window as a single icon.

Plenty of power users, however, delight in *partitioning* the hard drive—dividing its surface so that it appears on the screen as two different icons with two different names. At that point, you can live like a king, enjoying the following advantages just like people who have two separate hard drives:

- You can keep Windows XP on one of them and Windows Me (for example) on the other, so that you can switch between the two at startup time. (You may hear this feature called *dual booting*, a procedure described on page 561.)
- Life is much easier if you frequently install and reinstall the operating system, or different versions of it. Doing so allows you to keep all your files safely on one partition, confining all the installing/uninstalling activity to the other.

EX 2009

- You can use multiple partitions to keep your operating system(s) separate from folders and files. In this way, you can perform a *clean install* of Windows (page 560) onto one partition without having to worry about losing any of your important files or installation programs.

Unfortunately, partitioning a hard drive using the tools built into Windows XP requires first *erasing the hard drive completely.* And that, of course, involves copying all of your files and programs onto some kind of backup disk first—and then copying them back onto the hard drive when the process is over.

Ponder this compromise, weighing it against the advantages of partitioning.

Tip: You *can* partition your hard drive without having to erase everything on it–just not for free. Commercial programs like PartitionMagic *(www.powerquest.com)* create, resize, merge, and convert partitions without disturbing any of your files.

The Disk Management program included with Windows XP, therefore, is best suited for creating new partitions on *new or empty* hard drives. Ditto for FDISK, a DOS utility that can also do the job (as described in Appendix A).

In the Disk Management window, free space (suitable for turning into a partition of its own) shows up with a black bar and the label Unallocated. Figure 15-7, for example, depicts a brand new hard drive that hasn't yet been named or sliced up into partitions. The whole thing is still "unallocated."

To create a new partition, right-click one of these unallocated segments. From the shortcut menu, choose New Partition. A wizard appears, whose screens ask you:

- What kind of partition you want to create. (You'll usually want Primary.)
- How big you want the partition to be. If you're dividing up a 60 GB drive, for example, you might decide to make the first partition 20 GB and the second 40 GB. You'd begin by creating the 20 GB partition (right-clicking the big "Unallocated" bar in Figure 15-7); when that was over, you'd see a smaller "Unallocated" chunk still left in the Disk Management window. You'd right-click it and choose New Partition *again,* this time accepting the partition size the wizard proposes (which is *all* the remaining free space).
- What drive letter you want to assign to it.
- What disk-formatting scheme you want to apply to it (you'll usually choose NTFS—see page 462).

When the wizard is through with you, it's safe to close the window. A quick look at your My Computer window will confirm that you now have new "disks" (actually partitions of the same disk), which you can use for different purposes.

EX 2009

Turn a Drive into a Folder

Talk about techie: Most people could go their entire lives without needing this feature, or even imagining that it exists. But Microsoft loves power users, and this one's for them.

Using the Paths feature of Disk Management, you can actually turn a hard drive (or partition) into a *folder* on another hard drive (or partition). Each of these disks-disguised-as-folders is technically known as a *mounted drive, junction point,* or *drive path.* See Figure 15-9 for details.

This arrangement affords the following unique possibilities:

- In effect, you can greatly expand capacity of your main hard drive—by installing a second hard drive that masquerades as a folder on the first one.
- You can turn a burned CD into a folder on your main hard drive, too—a handy way to fool your programs into thinking that the files they're looking for are still in the same old place on your hard drive. (You could pull this stunt in a crisis—when the "real" folder has become corrupted or has been thrown away.)
- If you're a *power* power user with lots of partitions, disks, and drives, you may feel hemmed in by the limitation of only 26 assignable letters (A through Z). Turning one of your disks into a mounted volume bypasses that limitation, however. A mounted volume doesn't need a drive letter at all.
- A certain disk can be made to appear in more than one place at once. You could put all your MP3 files on a certain disk or partition—and then make it show up as a folder in the My Music folder of everyone who uses the computer.

Note: You can only create a mounted volume on an *NTFS-formatted* hard drive (page 462).

To bring about this arrangement, visit the Disk Management window, and then right-click the icon of the disk or partition that you want to turn into a mounted volume. From the shortcut menu, choose Change Drive Letter and Paths.

In the Change Drive Letter and Paths dialog box, click Add; in the next dialog box, click Browse. Navigate to and select an empty folder—the one that will represent the disk. (Click New Folder if you didn't create one in advance, as shown at right in Figure 15-9.) Finally, click OK.

Once the deed is done, take time to note a few special characteristics of a mounted volume:

- The mounted volume may behave just like a folder, but its icon is a dead giveaway, since it still looks like a hard drive (or CD drive, or DVD drive, or whatever).

  Still, if you're in doubt about what it is, you can right-click it and choose Properties from the shortcut menu. You'll see that the Type information says "Mounted Volume," and the Target line identifies the disk from which it was made.

EX 2009

- Avoid circular references, in which you turn two drives into folders on *each other.* Otherwise, you risk throwing programs into a spasm of infinite-loop thrashing.
- To undo your mounted-drive effect, return to the Disk Management program and choose View→Drive Paths. You're shown a list of all the drives you've turned into folders; click one and then click Remove. You've just turned that special, "I'm really a drive" folder into an ordinary empty folder.

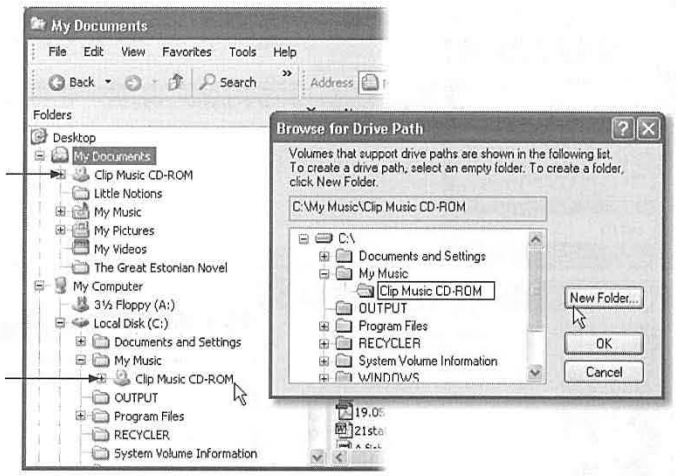


Figure 15-9:
Left: Man, how many CD drives does this guy have? Just one. But through the miracle of mounted volumes, it's appearing in as many different folders as the owner likes. You could do the same thing with a hard drive–make it appear as a folder icon on any other *drive.*

Right: Here's how to do it: Designate an empty folder to be the receptacle–a metaphysical portal–for the drive's contents.

Task Scheduler

The Scheduled Tasks window lets you set up Windows XP to open certain programs, utilities, and documents according to a schedule that you specify. Unfortunately, all it can do is *open* programs and documents on cue. Unless you're prepared to type in the special codes, called *switches,* the Scheduled Tasks window can't actually make them *do* anything once they're open. The tutorial on page 470 offers more information about switches.

To open the Task Scheduler (see Figure 15-10), choose Start→All Programs→ Accessories→System Tools→Scheduled Tasks. The Scheduled Tasks window opens, at first containing only a single icon (unless a program you've installed has already scheduled a task), called Add Scheduled Task.

Adding a Task to the Scheduler

To add a task to the schedule, double-click the Add Scheduled Task icon. A wizard appears; click Next. A list of programs now appears on your PC (Figure 15-10, bottom left). If the one you want to schedule is listed, click it. If not, click Browse, find and open its folder, and double-click its icon.

EX 2009

Now you're asked how often you want the new task to run: every day, every week, and so on. Make a selection, then follow the wizard's prompts to schedule your task. For example, if you chose Monthly, you can tell the wizard which *day* of the month, and at which time (Figure 15-10, bottom right).

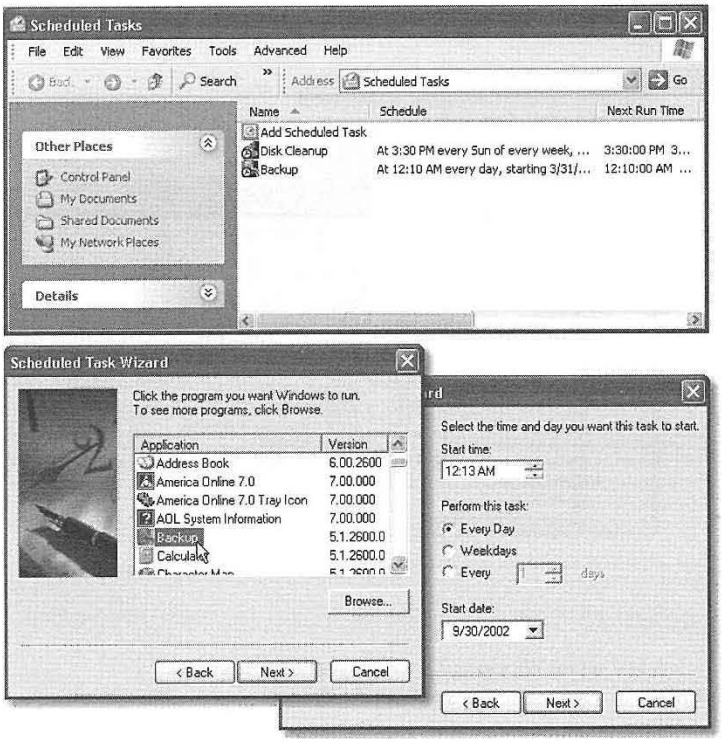


Figure 15-10:
Top: The Task Scheduler keeps a calendar for Windows XP. Tasks appear in the schedule when you enter them manually, or when other programs (such as the Maintenance Wizard) set them up. You can use the Task Scheduler window to add, modify, or remove tasks. (Make sure your computer is turned on during the time any task is supposed to run.)

Bottom: The wizard asks you what you want to open, and how often.

Finally, because Windows XP can accommodate multiple user accounts (see the next chapter), and can even run *your* tasks while somebody *else* is logged in and using the computer, you'll have to enter your user name and password.

Completing the wizard means you've successfully added a new icon to the Scheduled Tasks window (Start→Control Panel→Scheduled Tasks). If the window is in Details view, tidy little columns tell you what each task's schedule is and when it will run next.

Changing Scheduled Tasks

Double-clicking a task's listing in the Task Scheduler window opens its Properties dialog box (Figure 15-11), where you can make several kinds of changes:

EX 2009

- **Cancel a scheduled task.** You can, of course, stop a certain scheduled task from running just by deleting the task entirely—throwing away its icon from the Scheduled Tasks window. In many cases, however, you might find it more flexible to simply turn off its Enabled checkbox (on the Task tab of the Properties dialog box). The latter method leaves the task in the Task Scheduler window, so that you can turn it back on at a later date.
- **Change the schedule for a task.** Click the Schedule tab of the Properties dialog box to change the schedule for a task.
- **Change the settings for a scheduled task.** Using the Settings tab of a task's Properties dialog box, you can design certain automated tasks to run, or not, according to certain conditions (see Figure 15-11). For example, you might want to turn on "Only start the task if the computer has been idle for at least __ minutes," so that your processor-intensive task doesn't fire itself up when somebody else (using another account) is rendering 3-D movie scenes.

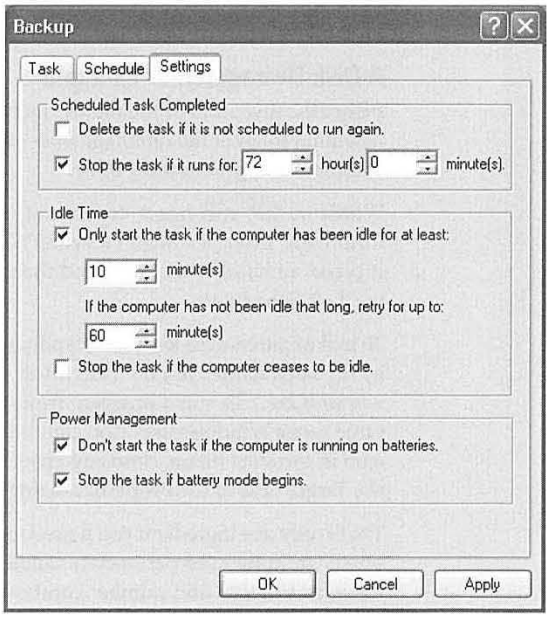


Figure 15-11: *Some of the factory settings for scheduled tasks are a bit ridiculous. For example, it's probably a good idea to stop a task if it runs longer than 4 or 5 hours, not 72 hours. In fact, except for defragging the hard drive, most scheduled tasks should take less than an hour. The bottom section of the dialog box applies to laptop computers.*

Start a Task Immediately

To trigger one of the listed programs right now, right-click its listing in the Scheduled Tasks window and choose Run from the shortcut menu. (The task will run again at its next scheduled time.)

EX 2009

Pause All Scheduled Tasks

If a schedule-triggering event is taking place on your PC while you're trying to work, thus slowing down the proceedings, you can suspend those background operations until your work is complete. Just open the Scheduled Tasks window and choose Advanced→Pause Task Scheduler.

When you think it's OK for those background-scheduled tasks to carry on, "unpause" the scheduler by choosing Advanced→Continue Task Scheduler.

Stop Using Task Scheduler

If you don't want any tasks to run, ever, open the Scheduled Tasks window and choose Advanced→Stop Using Task Scheduler. Doing so prevents the scheduler from starting up when you turn on the computer. (Choose Advanced→Start Using Task Scheduler to turn it back on.)

Note: You can request that Windows XP notify you, the next time you log on, when a task didn't run at its appointed time (because the PC was turned off, for example). To set this up, open the Scheduled Tasks window and then choose Advanced→Notify Me of Missed Tasks.

A Disk Defragmenter Example

Before the invention of the mouse, menus, and icons, computer geeks operated their machines solely at the *command line*—a black window where you had to type cryptic commands to get anything done.

Windows XP still has a command line (Start→All Programs→Accessories→Command Prompt). Most everyday Windows fans don't even know it's there—but it comes in handy every now and then. You need the command line, in fact, to use the Task Scheduler.

To make matters even less user-friendly, remember that Windows doesn't call programs by the same names you do. (Microsoft Word, for example, is really a program called *winword.exe*.) To run a program from the command line, you have to call it by the same name Windows uses. You can find what that is by right-clicking the program's icon in the Start menu, choosing Properties from the shortcut menu, and looking at the Target field in the Properties dialog box.

That's only one ingredient you'll need to run a program from the command line—the others are command parameters called *switches*. These are usually dashes or slashes followed by letter and number combinations, like the second part of the command *ping –t*, and they tell the program what to *do* once you've opened it. Task Scheduler runs programs by executing command line strings like this.

Putting together the correct switches to trigger the activity you want is not for the technically timid. But if you'd like to know what you're getting into, here's an example that demonstrates how to schedule Disk Defragmenter to run at a specific time (when you're sleeping, for example, and won't care that it's slowing down your PC). In fact,

EX 2009

this is one of the most common uses of the Task Scheduler: using it to trigger common maintenance tasks without your involvement.

Programming Disk Defragmenter

To schedule a program like Disk Defragmenter, you must first learn what switches it understands.

To discover which switches are available in a Windows XP program, open a Command Prompt window (Start→All Programs→Accessories→Command Prompt). Then type the name of the program, followed by either the *-h* or *-?* switch. (Both of these mean "help.") For example, you can find out which switches drive Disk Defragmenter by typing this:

```
Defrag -?
```

When you press Enter, a help screen like this appears:

```
Usage:
Defrag <volume> [-a] [-f] [-v] [-?]
volume  Drive letter or mount point d:\ or d:\vol\mountpoint
-a Analyze only
-f Force defragmentation even if free space is low
-v Verbose output
-? Display this help text
```

From this, you might discern that the command necessary to run the Disk Defragmenter on your hard drive (C:) is this:

```
Defrag C:\ -f
```

which means, "Use the *defrag* command on my C: drive; defragment it even if I don't have much free space."

Always test your command line before you schedule it to run unattended. If the command behaves itself while you're watching, you can be confident that it will do the same when Task Scheduler runs unattended.

To schedule the command, open the Scheduled Tasks program in the Control Panel. Double-click the Add Scheduled Task icon. The Scheduled Task Wizard appears; click Next to see the list of programs that the Task Scheduler offers to trigger.

However, Disk Defragmenter isn't listed, so you must click Browse and navigate to the Local Disk (C:)→Windows→System32 folder, where you'll find it (the program's real name is defrag.exe). Double-click it, and then proceed with the wizard screens that let you specify a schedule and record your account password. You can schedule the program to run once or at regular intervals, and even create multiple schedules for the same task. (If your user account doesn't *have* a password assigned, you'll have to create one, following the instructions on page 494.)

On the final wizard screen, don't click Finish until you've first turned on "Open advanced properties for this task when I click Finish." After you click Finish, a special

EX 2009

summary window appears, listing the program to be run: *C:/WINDOWS/SYSTEM32/defrag.exe*. Click in the Run box at the end of the command, press the Space bar, and then type *C:* (or whatever the drive letter is), another space, and then *-f*, as shown in Figure 15-12. Click OK.



Figure 15-12:
Disk Defragmenter is ready to roll. You've just told Disk Defragmenter to defrag the E: drive, and–thanks to the "-f" switch–to run whether it thinks you need it or not.

Finally, you're asked to type in your password—twice. When you click OK, your work is done. An icon for your scheduled task appears on the screen for the Disk Defragmenter schedule that you've just added, and it's prepared to run automatically at the times you specified.

Interpreting Results

If you switch the Scheduled Tasks window into Details view by choosing View→ Details, the Last Result column is supposed to tell you whether or not the tasks you scheduled were completed. Unfortunately, Task Scheduler doesn't translate the numerical result codes into English, so what you see in this column is typically a cryptic hexadecimal value like *0x0*.

All you have to know about such *exit codes* is that, in most cases, a value of 0 (or 0x0) means that the program ran without a hitch. Anything else represents some kind of error message. If that's what you get, you, or somebody who knows about this kind of thing, should try running the command in the Command Prompt window in hopes of discovering why it's not working correctly.

EX 2009

Microsoft Backup

Consider this: The proximity of your drive's spinning platters to the head that reads them is roughly the same proportion as the wheels of an airliner flying at 500 miles per hour, twelve inches off the ground. It's amazing that hard drives work as well, and as long, as they do.

Still, because a hard drive is nothing more than a mass of moving parts in delicate alignment, every now and then disaster strikes. That's why backing up your data (making a safety copy) on a regular basis is an essential part of using a PC. Even if computers aren't your career, there's probably a lot of valuable stuff on your hard drive: all of your digital photos, the addresses and phone numbers you've spent hours typing into your Contacts list, a lifetime's worth of email, the Web sites in your Favorites folder, and so on.

If you use Windows XP at home, or in a smaller company that doesn't have network nerds running around to ensure your files' safety, you might be grateful for Microsoft Backup, a very simple backup program that comes with Windows XP. It lacks some of the specialized features of commercial backup programs, but at least it lets you back up entire drives or selected files and folders, at times and under the conditions you specify, to other disks or tapes. You can even schedule it to run at regular intervals (using the Task Scheduler program), so that you always have a recent copy of your data on hand.

The thing is, the Windows XP installer doesn't give Backup to you. In fact, this program doesn't even appear as a system component that can be added with the Add or Remove Programs program in the Control Panel.

Instead, you must install it manually from the Windows XP CD, like this:

1. **Insert your Windows XP CD-ROM. At the welcome screen, click Exit.**

   You return to the Windows desktop.

2. **Choose Start→My Computer. In the My Computer window, right-click your CD-ROM icon; from the shortcut menu, choose Explore.**

   A Windows Explorer window appears, listing the contents of the Windows XP CD-ROM.

3. **In the list at the left side, open the VALUEADD→MSFT→NTBACKUP folder.**

   On the right side, you should see a file called NTBACKUP.MSI.

4. **Double-click the NTBACKUP.MSI icon.**

   An installer whirls into action.

5. **On the final screen of the wizard, click the Finish button.**

When the installation is complete, choose Start→All Programs→Accessories→System Tools→Backup to launch the Backup program. You're ready to perform your

EX 2009

first basic backup, known as a *backup job*. This process creates a single file, an archive containing other files and folders.

Creating a Backup Job

To launch the Backup program, choose Start→All Programs→Accessories→System Tools→Backup. A wizard walks you through the process of setting up a backup job, like this:

Backup or restore?

The first wizard screen (Figure 15-13, top) wants to know whether you want to *back up* your files (because you're a shrewd, confident, happy person in a time of PC health) or *restore* them (because you're a desperate, unhappy person whose files have somehow been deleted or corrupted).

To back up your files, of course, click "Backup files and settings" and then click Next.

Create a backup job

The next wizard window asks what you want to back up:

- **My documents and settings, Everyone's documents and settings.** These options assume that you're using a PC shared by several people, each with a separate account (see the next chapter). It's asking whether you want to back up just *your* files and settings, or those of every account holder. (If you're the sole proprietor of your machine, just use the first option.)
- **All information on this computer.** This option tells Backup to copy every single file and folder on your drive(s), including almost two gigabytes of Windows itself. This is a massive project—and, in general, an unnecessary one. After all, you already have a backup of Windows itself (on your Windows CD) and of your programs (on the original software disks), so there may not be much point in making another copy.
- **Let me choose what to back up.** This option leads to a Windows Explorer–like display (see Figure 15-13, bottom) that lets you choose the specific folders and files to be backed up.

Tip: If you choose this option, don't miss the System State icon. Selecting this icon backs up the Windows XP *registry* (Appendix C) and other vital system components that are otherwise inaccessible because they're in use while the backup is running. In case of disaster, only people who backed up the System State will be able to *completely* restore their PCs to their original conditions.

Select the backup disk

The next screen asks where you want to store the backup files you're about to create.

EX 2009

Now, an external hard drive makes an extremely convenient backup system, since it spares you the hassle of inserting and tracking multiple removable disks (like Zips or CDs).

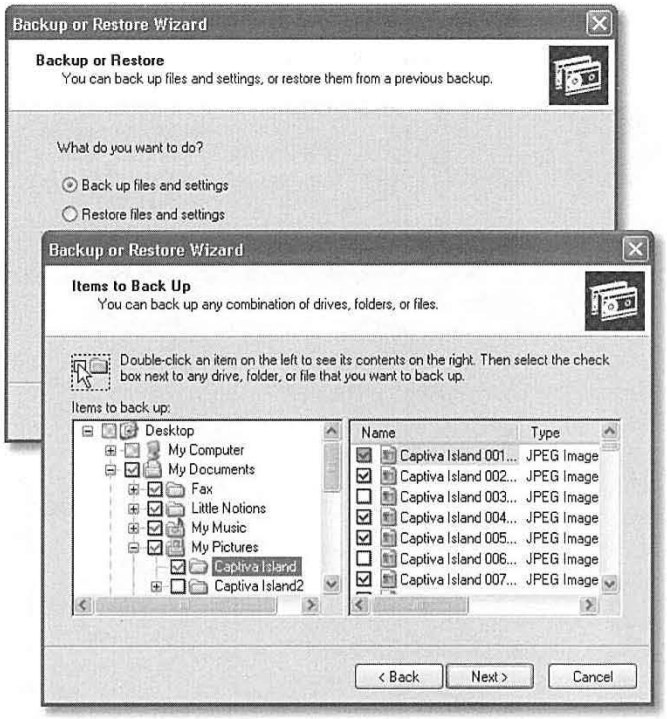


Figure 15-13:
Top left: Microsoft Backup lets you either back up or restore your files.

Bottom right: Expand the listing of drives and folders by clicking the plus signs. Turn on the checkbox next to any folder or file that you want backed up. To deselect a file, turn off its checkbox. Don't forget that you can drag the gray, vertical divider bar to widen the left panel.

Still, removable disks are the safest disks of all, because you can store them somewhere else: in a fireproof box, a safe deposit box at the bank, or the trunk of your car—anywhere but in your office, making your data safe even in the case of fire or burglary. Today's popular backup-disk formats include floppies, Zip or Jaz disks, recordable CDs, tape cartridges, and so on.

But in Backup, the drop-down list starts out suggesting that you back up your hard drive onto *floppy disks*—not exactly a forward-thinking choice. Considering the massive size of today's hard drives, you'll be inserting blank floppies for the next three presidential administrations.

Instead, if your PC does, in fact, have a backup disk connected (a magnetic tape drive, for example, another hard drive, or a Zip drive), choose its name from this drop-down list.

EX 2009

The other option, available on all computers, is to back up the selected data to a file on your hard drive. You can use this option to create CD-sized backup files for burning onto CDs later, to back up your data to another hard drive in the same computer, or to back up to another computer on the network. (To use the latter option, click Browse.) In any case, click Cancel if you're asked to insert a floppy disk.

The Save As dialog box appears. Name the backup file you're creating (its filename extension is *.bkf*). Click Save when you've selected a location and typed a name.

POWER USERS' CLINIC

Advanced Backup Types

As noted above, the Advanced wizard offers you a choice among several kinds of backups.

To understand the differences, it's important to understand that each time it backs up a file, backup programs manipulate an invisible switch on that file called the *archive bit*. It's a little note to itself, a flag that tells Windows whether or not that file needs backing up.

In a **Normal** backup, for example, the program copies all of the selected files to the backup drive, regardless of their archive bits. During the backup process, Windows changes each archive bit to Off, in effect marking it as having been backed up.

(If you later make changes to the file, Windows turn its archive bit back on. As a result, files whose archive bits are turned on are the ones that have been changed since the last Normal backup.)

If you choose **Copy**, Backup copies the files, but doesn't turn off their archive bits. In other words, you're simply using Backup as a glorified copying program.

An **Incremental** backup copies *only* files whose archive bits are set to On—that is, files that are new or have changed since the last Normal backup. After the backup, all archive bits get turned off again, denoting everything as having been backed up.

Incremental backups work much faster (and use less space) than full backups, since Windows copies only a few files each time. But they're less convenient if the worst should happen. When restoring your files to the PC from your backup disks, you must restore each backup file in chronological order, beginning with the Normal backup disks and proceeding through all of the incrementals performed since that last Normal backup.

A **Differential** backup also copies only the files that have their archive bits turned on. So far, it's the same as an incremental backup. However, this type of job leaves the archive bits as they are instead of turning them off. Therefore, the *second* differential backup *also* backs up all the files that have been changed since the full backup, and so does the third. In other words, if you perform a full backup on Monday, the differential backups on Tuesday, Wednesday, and Thursday each back up *all* the files that have changed since Monday.

Of course, this system requires more backup disk space (or tapes), because you're actually making duplicate and triplicate copies of certain files. But the payoff comes when your hard drive dies. Instead of having to restore each day's backup job (as you would with an incremental backup), you need to restore only the last Normal backup and *one* differential backup set (the most recent one)—a relatively fast and simple procedure.

A typical backup cycle is to perform a Normal backup once a week or month, with incremental or differential backups in between.

This technical tradeoff between convenience at backup time and convenience in case of disaster should sound familiar to anyone who's ever had to choose between two insurance policies, one of which costs less but has a high deductible.

Finally, the **Daily** backup copies files you created or changed today. It doesn't change the archive bits.

EX 2009

Advanced backup options

The final wizard screen now appears (Figure 15-14). If you click Finish, the backup process begins—a process that may take several seconds or several hours, depending on how much you're copying. Your work here is done.

On the other hand, if you click the Advanced button on the final wizard screen, you're treated to yet another wizard. Most people, most of the time, will never need these special-case options, but here's what the screens of the Advanced wizard offer:

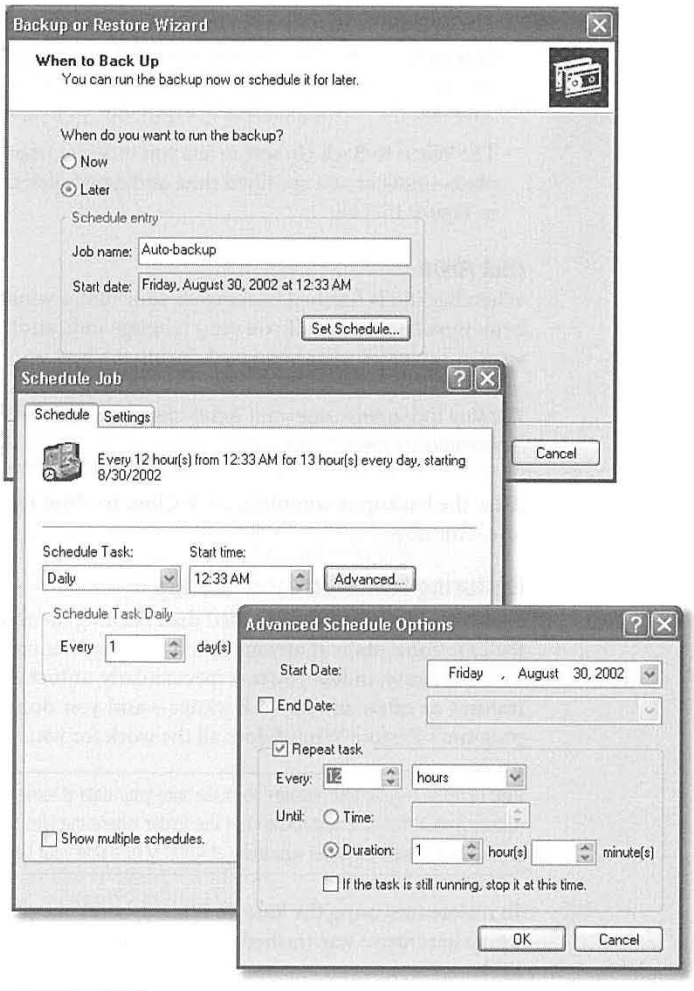


Figure 15-14: *Of all the Advanced options, this series of screens (click Set Schedule, then Advanced) may be the most useful, because it lets you establish a backup that runs automatically, without your involvement. (Behind the scenes, it creates a task in your Start→Control Panel→ Scheduled Tasks window, where you can manipulate it or adjust its schedule.)*

EX 2009

- Choose the *type* of backup you want: Normal, Copy, Incremental, Differential, or Daily (see the box on page 476).
- The next part of the screen offers to *verify* each file that's backed up. In just a few seconds, you get a confirmation that the copy perfectly matches the original—a good idea.

  On the same screen, you may be offered something called Hardware Compression, a reference to circuitry inside a tape drive that condenses the amount of space your files take up. If your drive offers this feature, use it.
- The Backup Options screen lets you specify what should happen if your backup disk already contains previous backup files. "Append this backup to the existing backups" preserves the earlier backup set—at the expense of disk space, of course. "Replace the existing backups" wipes out the original backup.
- The When to Back Up screen lets you indicate when you want this backup to take place—now or at a specified time and date (click the Set Schedule button shown in Figure 15-14).

Click Finish

When Backup is finished backing up your files, a window shows how many files and bytes were backed up. (If you see a message indicating an error, click Report to see a written record of what happened during the backup.)

Tip: Most backup errors arise when Backup tries to back up a file that's open. To avoid this problem, exit all your programs before backing up.

After the backup is complete, click Close to close the Report window. Your data is safe—for now.

Restoring with Microsoft Backup

Restoring files is less complicated than backing them up—a good thing, considering the emotional state of anyone who's just experienced a total hard drive meltdown. That's because, unless you're a spectacularly unlucky individual, you don't perform restores as often as you do backups—and you don't schedule them. The Backup program's Restore Wizard does all the work for you.

Tip: Perform regular test restores, to make sure your data is retrievable from the backup disks. (Consider restoring your files to a test folder–not the folder where the files came from–so you don't wind up with duplicates.) There's no other way to be absolutely sure that your backups are working properly.

To restore files using the Restore Wizard, here's the plan (which assumes that, if your whole hard drive was trashed, you have already replaced it and reinstalled Windows XP):

EX 2009

1. **Click Start→All Programs→Accessories→System Tools→Backup.**

   The Backup or Restore Wizard Welcome screen appears.

2. **Click Next. On the second screen, click "Restore files and settings," and then click Next.**

   The What To Restore page contains the now-familiar expanding display that lists your PC's backup devices. The display lists a File icon, too, so that you can restore from a backup file (see "Select the backup disk" on page 474). Backup displays the date and time each backup file was made, making it easy to select the right file. If you use a tape drive or other device for your backups, the display lists the tapes or disks you have created.

   Click to select the items you want to restore, exactly as you did when selecting files to back up.

Tip: Clicking the + button expands a folder so that you can select an individual file inside it. This is also a great trick if you're restoring, from your backup file, a document that you've accidentally deleted from the hard drive.

---

3. **Select the tape or disk that contains your backup. Select the data to restore.**

   When you select the backup disk or tape, the right pane in the What to Restore screen contains an expandable list of its contents. Double-click the folders seen here for a list of individual files. Turn on the checkboxes of the files and folders you want to restore, as shown in Figure 15-15.

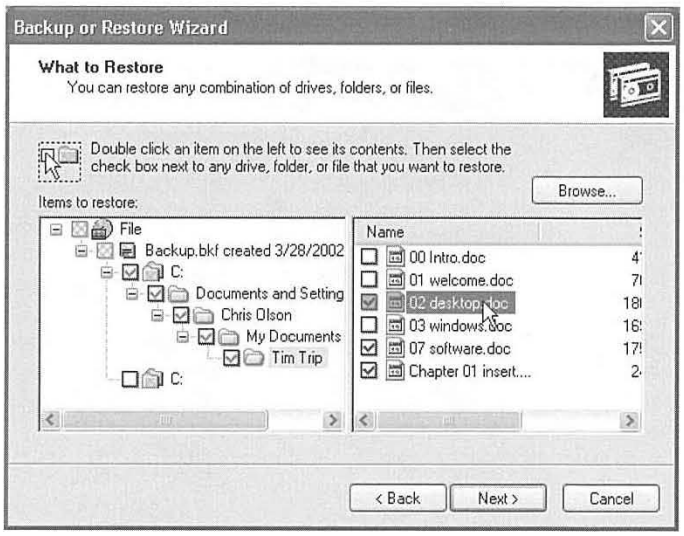


Figure 15-15: *The Restore Wizard's What to Restore page is similar in format to Windows Explorer, except that it displays only the contents of a particular backup tape or disk. You can select from the backup tapes, disks, or files you've created, or click Import File to read the contents of a backup file you created on another Windows XP system.*

EX 2009

Note: Whenever Backup backs up your files, it remembers which files it put on which backup disks by creating a table of contents on the disk or tape that was in the drive when the job ended.

That's why, as you browse the files listed on a backup disk, you may be asked to insert that final disk or tape. Only then can Backup show you what's on it.

4. **On the Completing the Backup or Restore Wizard screen, click the Advanced button, if you like.**

   Ordinarily, Backup restores every backed-up file onto your hard drive in exactly the same folder from which it came. If the original file is still *in* that original folder, however, it doesn't bother copying the equivalent file from the backup disk. If that arrangement sounds good to you, skip to the next step.

   But suppose you'd like Backup to put the files in a *different* folder, or you want them to *replace* the duplicate files it encounters. In that case, the Advanced button is just the ticket. It lets you specify where you want the restored files to go: into the folders they came from or some other disk or folder.

   If you choose "Alternate location," you can type in the path to (or Browse to) a different folder (like *C:\Rescued*). If there's no such folder, Backup will create it for you.

   If you turn on "Single folder," Backup dumps all of the selected files directly into one specified folder, loose (not in a hierarchy of folders). Choose this option if you're simply trying to reclaim a few important files, rather than trying to reinstate your entire drive.

5. **Click Next. Indicate whether or not you want Backup to overwrite duplicate files.**

UP TO SPEED

Floppy Disk Crash Course

Floppy disks are quickly becoming extinct, largely because sending files by email or over network wiring are much faster and more convenient ways of shuttling information between computers. But in a pinch, it's still useful to know the basics of using floppy disks: how to insert, erase, eject, and copy them.

Insert a floppy disk into your floppy drive label side up, metal side first. (If your floppy drive is mounted vertically, the label side faces away from the eject button.) To see what's on the disk, double-click your My Computer icon, and then double-click the "3 1/2 Floppy (A:)" icon. (If you double-click this icon when there's no disk is in the drive, you'll get nothing but an error message.)

To erase (format) a floppy, right-click the "3½ Floppy (A:)" icon and choose Format from the shortcut menu. To make a copy of the disk, right-click the icon and choose Copy from the shortcut menu. A little window appears like the one shown here, which you can use to specify where you want the copy made.

To remove the floppy from your machine, push the plastic eject button next to the drive slot, or right-click the floppy's icon and choose Eject from the shortcut menu.

EX 2009

Backup's file-restoring feature isn't only useful when you've had to wipe out your hard drive completely. It can also be handy when something less drastic went wrong, like a folder accidentally being thrown out. All the rest of your files and folders are OK.

But suppose you've indicated that you want your My Documents folder restored from the backup disks. What should Backup do when it encounters files that are *still in* your My Documents folder, and in perfect shape? You can choose one of three options. **Leave existing files** means that Backup won't restore any file that's already on the hard drive. **Replace existing files if they are older than the backup files** makes Backup replace a file on your hard drive only if it's an *older version* than the backed-up copy. Finally, **Replace existing files** restores every file, replacing its equivalent on the hard drive, regardless of which is newer.

6. **Click Next.**

   The options on this penultimate screen pertain to specialized security and system files.

   You're free to click past them, but if curiosity gets the better of you, here's what these three very technical options do.

   "Restore security settings" restores certain settings for each file and folder, including permissions and file ownership—an option available only for files you backed up from a Windows XP, NTFS-formatted machine (and files that you're restoring to one).

   The second option is "Restore junction points, but not the folders and file data they reference." As noted on page 466, a *junction point* is a *folder* from one drive (not the disk itself) that you've rigged to show up as a folder on another. Turn this option on if you're restoring a mounted drive; turn it off if you want to restore only the folder *containing* the mounted drive.

   The third option, "Preserve existing volume mount points" pertains to mounted drives themselves—that is, when you've made one *entire disk* show up as a folder on a second disk (page 466). Turn this option on if you want to restore data to a *replacement* drive, on which you've restored mounted drives yourself. Turn it off if you're restoring data to a reformatted partition or drive, and want to restore the old volume mount points from the backup.

7. **Click Next. If the restore summary page looks good, click Finish.**

   Backup swings into action, asking you to insert backup disks or tapes as necessary, and restoring your backed-up files safely onto your hard drive.

The Briefcase

In its way, the Briefcase is a form of backup program, but for a very specific purpose: It's designed to help you keep your files straight when you transport them from desktop

EX 2009

to laptop, or from home to work. If you learn to use the Briefcase, you'll be less likely to lose track of which copies of your documents are the most current.

To use the Briefcase, start by adding a briefcase icon on your desktop. To do so, right-click any spot on the desktop; from the shortcut menu, choose New→Briefcase. A new icon appears, called New Briefcase. (If you're feeling inspired, rename it.)

Now round up the icons of the documents you'll work on when away from your main PC. Drag them onto the My Briefcase icon. Windows XP copies the files into this special temporary holding tank.

Connect your laptop to the desktop PC, if you haven't already. (See Chapter 17 for tips on connecting machines.) Or, if you plan to take your files with you on a disk (such as a floppy or Zip disk), insert the disk. Drag the My Briefcase icon onto the laptop or the disk.

You're ready to leave your office. When you get to wherever you're going, open and edit the documents in the copied Briefcase "folder" icon. Just don't move them.

When you return to your main PC, reconnect the laptop or reinsert the travel disk. Now all of your careful step-following is about to pay off. Open the disk or laptop window and double-click its My Briefcase icon. In the Briefcase window, click the "Update all items" link in the task pane. Windows copies the edited files back to their original folders on your desktop-PC hard drive, automatically replacing the older, original copies. (If you highlighted only some of the icons in the Briefcase window, you can instead click "Update the selected items." Windows copies only the highlighted icons back to the main PC.)

Safe Mode and the Startup Menu

PC troubleshooting is among the most difficult propositions on earth, in part because your machine has so many cooks. Microsoft made the operating system, another company made the computer, and dozens of others contributed the programs you use every day. The number of conflicts that can arise and the number of problems you may encounter are nearly infinite.

If the problems you're having are caused by drivers that load just as the computer is starting up, turning them all off can be helpful, at least so that you can get into your machine to begin your troubleshooting pursuit. That's precisely the purpose of the Startup menu—a menu most people never even know exists until they're initiated into its secret world by a technically savvy guru.

Making the Startup menu appear is a matter of delicate timing. It goes like this:

1. **Restart the computer. Immediately after the *BIOS startup messages* disappear, press the F8 key (on the top row of most keyboards).**

   The BIOS startup messages—the usual crude-looking text on a black screen, filled with copyright notices and technical specs—are the first things you see after turning on the computer.

EX 2009

If you press the F8 key after the Windows logo makes its appearance, you're too late. If you've done it right, on the other hand, you see a message that says, "Please select the operating system to start." Most people have only one option here—"Microsoft Windows XP Home Edition."

2. **At the "Please select the operating system" screen, press F8 again.**

   If all goes well, you'll see the Windows Advanced Options Menu (see Figure 15-16). Displayed against a black DOS screen, in rough lettering, is a list of options that includes Normal, Logged, Safe Mode, and so on.

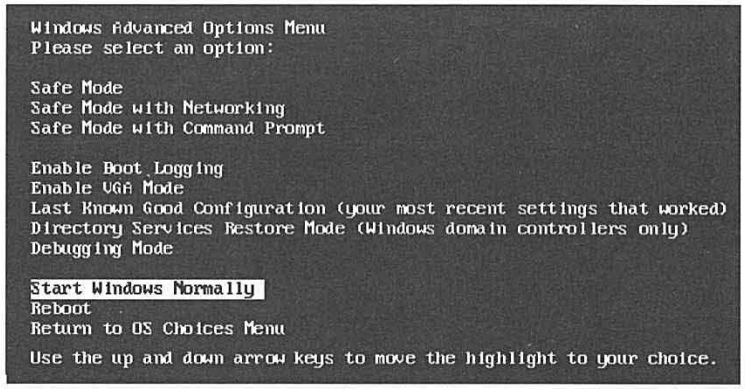


Figure 15-16: *The Startup menu (not to be confused with the Start menu) appears only when you press F8 a couple times as the computer is starting up. In times of deep trouble, it can be a lifesaver.*

3. **Select the startup option you want.**

   To make a selection, press the up or down arrow keys to "walk through" the list. Press Enter when you've highlighted the option you want.

Here's what the Startup menu commands do:

- **Safe Mode.** Safe Mode starts up Windows in a special, stripped-down, generic, somewhat frightening-looking startup mode—with the software for dozens of hardware and software features *turned off.* Only the very basic components work: your mouse, keyboard, screen, and disk drives. Everything else is shut down and cut off. In short, Safe Mode is the tactic to take if your PC *won't* start up normally, thanks to some recalcitrant driver.

  Once you've selected the Safe Mode option on the Startup menu, Windows asks which operating system you want to run—for most people, Windows XP is the only choice, so just press Enter. Now you see a list, filling your screen, of every driver that Windows is loading. Eventually, you'll be asked to log in; a dialog box then appears, reminding you that you are in Safe Mode.

  This dialog box offers two useful buttons. Yes proceeds with the startup process, taking you to the Windows desktop. Clicking No takes you directly to the System

EX 2009

Restore screen shown in Figure 15-2, so that you can choose a date when your computer was running properly—and rewind to that happier time.

You'll probably discover that your screen looks like it was designed by drunken cave men, with jagged and awful graphics and text. That's because in Safe Mode, Windows doesn't load the driver for your video card. (It avoids that driver, on the assumption that it may be causing the very problem you're trying to troubleshoot.) Instead, Windows XP loads a crude, generic driver that works with *any* video card.

Tip: Note, by the way, how *fast* Windows is in this mode–a testimony to the dragging effect of all those modern graphic niceties.

The purpose of Safe Mode is to help you troubleshoot. If you discover that the problem you've been having is now gone, you've at least established that the culprit is one of the drivers that Windows has now turned off. Safe Mode also gives you full access to the technical tools of Windows XP, including System Restore (page 451), the Device Manager (page 443), the Registry Editor (Appendix C), Microsoft Backup (page 473), and the Help center. You might use the Device Manager, for example, to roll back a driver that you just updated (page 447), or System Restore to undo some other installation that seems to have thrown your PC into chaos.

If this procedure doesn't solve the problem, contact a support technician.

POWER USERS' CLINIC

The Recovery Console

Between System Restore and Safe Mode, everyday Windows users are well equipped to recover from most typical Windows snafus. But there are times–extremely rare ones, thank goodness–when the files of Windows itself are so corrupted that you can't even access these tools.

In those situations, technically proficient PC fans can take advantage of something called the Recovery Console. As in DOS or UNIX, this window displays nothing but text–no icons, menus, or other graphic niceties–but if you know the correct commands to type, Recovery Console can help get you out of some very tight scrapes. It lets you manipulate files and folders, turn off specific drivers or background services, perform certain hard drive repairs, and even erase (reformat) drives.

To prevent unscrupulous techies from exploiting this emergency tool, Recovery Console offers access only to the system files and folders of Windows itself–application and document folders are off-limits–and doesn't let you copy files onto floppies, Zip disks, or other removable disks. Otherwise, however, Recovery Console looks and works much like the standard DOS command prompt. (Type *help*–and then press Enter–to see a list of all the commands you can use.)

To access Recovery Console, restart the PC from your Windows XP CD-ROM. (On some computers, of course, you can't start up from a CD until you first adjust settings in the BIOS. Ask your PC's manufacturer for help.)

When you see the Welcome to Setup screen, press the R key, and then type and the number corresponding to the copy of Windows you want repaired. When you're asked for the password, just press Enter.

When you're finished making your repairs, type *exit* to get out of Recovery Console and restart the PC.

EX 2009

- **Safe Mode with Networking.** This option is exactly the same as Safe Mode, except that it also lets you load the driver software needed to tap into the network, if you're on one—an arrangement that offers a few additional troubleshooting possibilities, like being able to access files and drivers on another PC. (If you have a laptop that uses a PC-Card networking card, however, this option still may not help you, since the PC-Card driver itself is still turned off.)
- **Safe Mode with Command Prompt.** Here's another variation of safe mode, this one intended for ultra-power users who are more comfortable typing out text commands at the command prompt (page 193) than using icons, menus, and the mouse.
- **Enable Boot Logging.** This startup method is the same as Normal, except that Windows records every technical event that takes place during the startup in a log file named *ntbtlog.txt* (it's on the startup drive, in the Windows folder).

  Most of the time, you'll use the Boot Logging option only at the request of a support technician you've phoned for help. After confirming the operating system startup, the technician may ask you to open ntbtlog.txt in your Notepad program and search for particular words or phrases—usually the word "fail."
- **Enable VGA Mode.** In this mode, your PC uses a standard VGA video driver that works with all graphics cards, instead of the hideously ugly generic one usually seen in Safe Mode. Use this option when you're troubleshooting video-display problems—problems that you are confident have less to do with drivers than with your settings in the Display control panel (which you're now ready to fiddle with).
- **Last Known Good Configuration.** Here's yet another method of resetting the clock to a time when your PC was working correctly, in effect undoing whatever configuration change you made that triggered your PC's current problems. It reinstates whichever set of drivers, and whichever Registry configuration, was in force the last time the PC was working right. (This option isn't as effective as the newer System Restore option, however, which also restores operating-system files in the process.)
- **Directory Services Restore Mode.** This extremely technical option is useful only in corporations with specialized *domain controller* computers running Windows .NET Server or Windows 2000 Server.

FREQUENTLY ASKED QUESTION

"Invalid system disk" Message

OK, I'll bite. I started up my PC, but it won't finish starting up. Instead, I get a message that says, "Invalid system disk (or Non-system disk); Replace and strike any key when ready." What gives?

You probably left a floppy disk in your floppy drive. Remove the floppy disk and then press any key to proceed with the startup. (It's evidently too much trouble for Microsoft to just *tell* you that.)

EX 2009

- **Debugging Mode.** Here's another extremely obscure option, this one intended for very technical people who've connected one PC to another via a serial cable. They can then use the second computer to analyze the first, using specialized debugger software.
- **Start Windows Normally.** This option starts the operating system in its usual fashion, exactly as though you never summoned the Startup menu to begin with. The Normal option lets you tell the PC, "Sorry to have interrupted you...go ahead."
- **Reboot.** Choose this command to restart the computer.
- **Return to OS Choices Menu.** Use this choice to back up to the "Please select the operating system to start" screen that first appeared when you pressed F8 during startup.

EX 2009

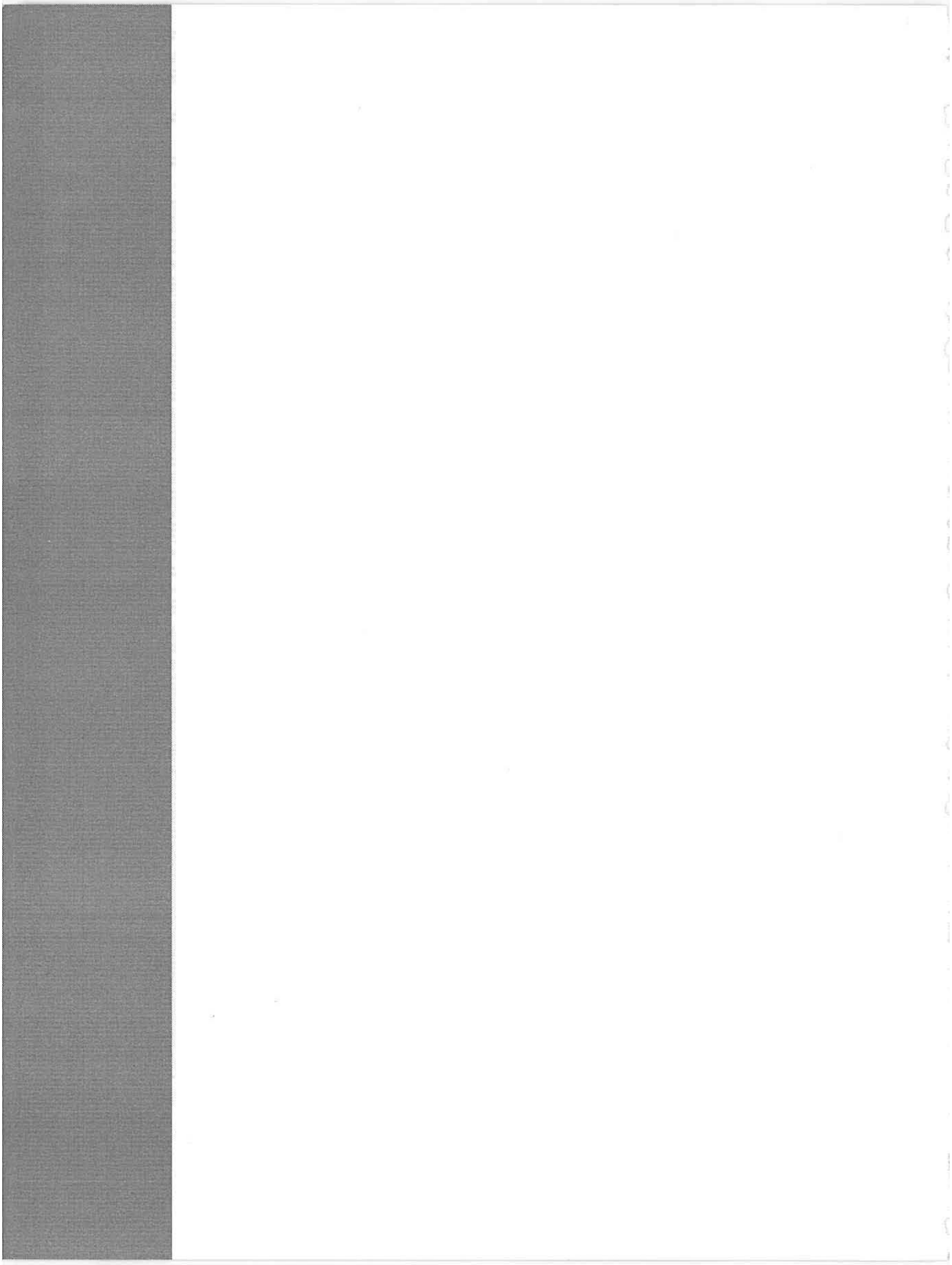
5

Part Five: Building a Network

Chapter 16: Accounts, Security, and Logging On

Chapter 17: Setting Up a Network

Chapter 18: Using Your Network



CHAPTER
16

Accounts, Security, and Logging On

For years, teachers, parents, tech directors, and computer lab instructors struggled to answer a difficult question: How do you rig one PC so that several different people can use it throughout the day, without interfering with each others' files and settings? And how do you protect a PC from getting fouled up by mischievous (or bumbling) students and employees?

Like the Windows 2000 under its skin, Windows XP is designed from the ground up to be a multiple-user operating system. On a Windows XP machine, anyone who uses the computer must *log on*—click (or type) your name and type in a password—when the computer turns on. And upon doing so, you discover the Windows universe just as you left it, including these elements:

- **Desktop.** Each person sees a different set of shortcut icons, folder icons, and other stuff left out on the desktop.
- **Start menu.** If you reorganize the Start menu, as described in Chapter 1, you won't confuse anybody else who uses the machine; no one else can even *see* the changes you make.
- **My Documents folder.** Each person sees only her own stuff in the My Documents folder.
- **Email.** Windows XP maintains a separate stash of email messages for each account holder—along with separate Web bookmarks, MSN Messenger contact list, and other online details.
- **Favorites folder.** Any Web sites, folders, or other icons you've designated as Favorites appear in *your* Favorites menu, and nobody else's.

EX 2009

- **Internet cache.** You can read about *cached* Web pages in Chapter 11; this folder stores a copy of the Web pages you've visited recently for faster retrieval.
- **History and cookies.** Windows maintains a list of recently visited Web sites independently for each person; likewise a personal collection of *cookies* (Web site preference files).
- **Control Panel settings.** Windows memorizes the preferences each person establishes using the Control Panel (see Chapter 8), including keyboard, sound, screen saver, and mouse settings.

Tip: Behind the scenes, Windows XP stores *all* of these files and settings in a single folder that techies call your *user profile.* It's in your My Computer→Local Disk (C:)→Documents and Settings→[Your Name] folder.

This feature makes sharing the PC much more convenient, because you don't have to look at everybody else's files (and endure their desktop design schemes). It also adds a layer of security, making it less likely for a marauding 6-year-old to throw away your files.

If you're a solo operator, the only person who uses your PC, you can safely skip this chapter. You *will* be using one of these accounts, whether you realize it or not—it's just that there won't be any additional accounts on your PC. You'll be able to use your PC just as you always have.

But when you've got some reading time—perhaps when you're stuck in line at the Department of Motor Vehicles—you may want to skim the concepts presented here. Certain elements of this multiple-user operating system may intrude upon your Windows activities—and the discussions in this book—from time to time.

Tip: Even if you don't share your PC with anyone and don't create any other accounts, you might still appreciate this feature because it effectively password-protects the entire computer. Your PC is protected from unauthorized fiddling when you're away from your desk (or when your laptop is stolen)–especially if you direct Windows to require your logon password any time after the screen saver has kicked in (page 263).

Introducing User Accounts

When you first installed Windows XP or fired up a new Windows XP machine, you were asked for a name and password. You may not have realized it at the time, but you were creating the first *user account.*

Since that fateful day, you may have made a number of changes to your desktop—fiddled with your Start menu, changed the desktop wallpaper, added some favorites to your Web browser, downloaded files onto your desktop, and so on—without realizing that you were actually making these changes only to *your account.*

Accordingly, if you create an account for a second person, when she turns on the computer and signs in, she'll find the desktop exactly the way it was as factory installed by Microsoft: basic Start menu, Teletubbies-hillside desktop picture, default

EX 2009

Web browser home page, and so on. She can make the same kinds of changes to the PC that you've made, but nothing she does will affect your environment the next time *you* log on. You'll still find the desktop the way you left it: *your* desktop picture fills the screen, the Web browser lists *your* bookmarks, and so on.

In other words, the multiple-accounts feature has two components: first, a convenience element that hides everyone else's junk; and second, a security element that protects both the PC's system software and other people's work.

Setting up Accounts

To see what accounts are already on your PC, choose Start→Control Panel. Open the User Accounts icon; you'll see a list of existing accounts (Figure 16-1).

If you see more than one account here—not just yours—then one of these situations probably applies:

- You created them when you installed Windows XP, as described in Appendix A.

Tip: All of the accounts you create when you first install Windows XP become *Administrator* accounts, as described in the following section.

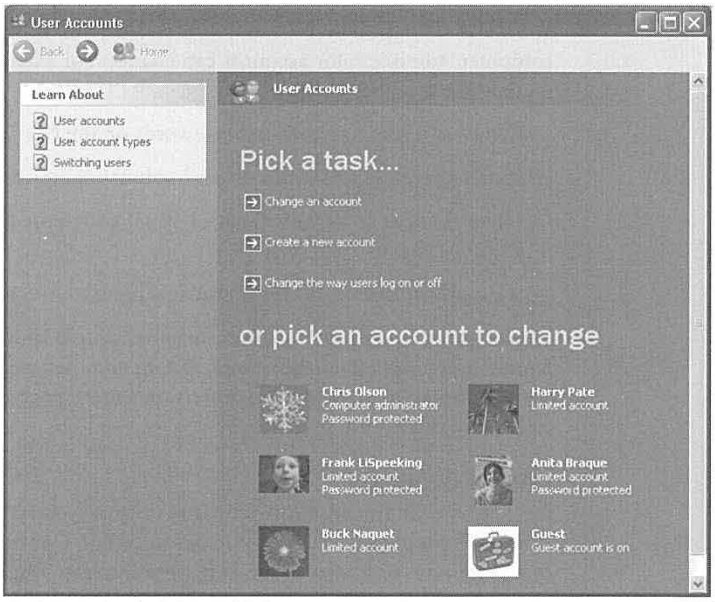


Figure 16-1: *This screen lists everyone for whom you've created an account. From here, you can create new accounts or change people's passwords. (Hint: To change account settings, just click the person's name on the bottom half of the screen. Clicking the "Change an account" link at top requires an extra, redundant click.)*

EX 2009

- You bought a new computer with Windows XP preinstalled, and created several accounts when you were asked to do so the first time you turned on the machine.
- You upgraded the machine from an earlier version of Windows. Windows XP gracefully imports all of your existing accounts.

Note: Beware: If you've upgraded from Windows 98 or Me, Windows XP (a) treats all of these imported accounts as Administrator accounts, described below, and (b) wipes out their passwords, which leaves open a security hole the size of Canada. Promptly after upgrading, therefore, you should take a moment to assign passwords and downgrade account types to Limited, as described below.

If you're new at this, there's probably just one account listed here: yours. This is the account that Windows XP created when you first installed it.

Administrator Accounts

It's important to understand the phrase that appears just under each person's name. On your own personal PC, the words "Computer administrator" probably appear underneath yours.

Because you're the person who installed Windows XP to begin with, the PC assumes that you're one of its *computer administrators*—the technical wizards who will be in charge of it. You're the teacher, the parent, the resident guru. You're the one who will maintain this PC and who will be permitted to make system-wide changes to it.

You'll find settings all over Windows XP (and all over this book) that *only* people with computer Administrator accounts can change. For example, only an administrator is allowed to:

- Create or delete accounts and passwords on the PC.
- Install new programs (and certain hardware components).
- Make changes to certain Control Panel programs that are off-limits to non-administrators.
- See and manipulate *any* file on the machine.

As you go about creating accounts for other people who'll use this PC, you'll be offered the opportunity to make each one an administrator just like you. Needless to say, use discretion. Bestow these powers only upon people as responsible and technically masterful as you.

Limited Accounts

Anyone who isn't an administrator is an ordinary, everyday Limited account holder. "Limited" people have everyday access to certain Control Panel settings—the ones that pertain to their own computing environments. But most other areas of the PC are off-limits, including everybody else's My Documents folders, Windows system files, and so on.

EX 2009

If you're a Limited account holder, in other words, your entire world consists of the Start menu, your My Documents folder, the Shared Documents folder, and any folders you create.

Tip: If a Limited account holder manages to download a computer virus, its infection will be confined to his account. If an administrator catches a virus, on the other hand, every file on the machine is at risk.

That's a good argument for creating as few computer administrator accounts as possible. (In fact, some Windows pros don't even use Administrator accounts *themselves*. Even they use Limited accounts, keeping one Administrator account on hand only for new software or hardware installations, account or password changing, and similar special cases.)

Adding an Account

Once you've opened the User Accounts program in the Control Panel, it's easy to create a new account: just click the "Create a new account" link, shown in Figure 16-1. (You see this link only if you are, in fact, an administrator.)

A wizard guides you through the selection of a name and an account type (see Figure 16-2).

When you're finished with the settings, click the Create Account button (or press Enter). After a moment, you return to the User Accounts screen (Figure 16-1), where

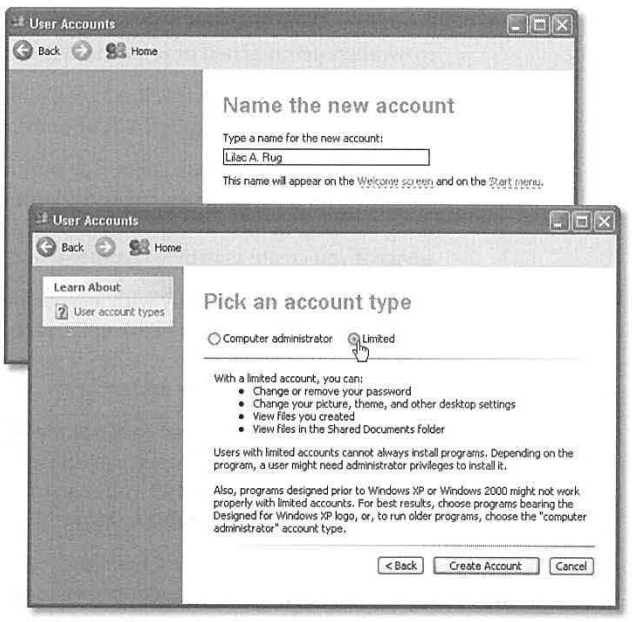


Figure 16-2:
Top: If it's all in the family, the account's name could be Chris or Robin. If it's a corporation or school, you'll probably want to use both first and last names. Capitalization doesn't matter, but most punctuation is forbidden.

Bottom: This is the master switch that lets you specify whether or not this unsuspecting computer user will be a computer administrator, as described above.

EX 2009

the new person's name joins whatever names were already there. You can continue adding new accounts forever or until your hard drive is full, whichever comes first.

Tip: If you never had the opportunity to set up a user account when installing Windows XP—if you bought a PC with Windows XP already on it, for example—you may see an account named Owner, already in place. Nobody can use Windows XP at all unless there's at least *one* Administrator account on it, so Microsoft is doing you a favor here.

Just use the User Accounts program in the Control Panel to change the name Owner to one that suits you better. Make that account your own, using the steps in the following paragraphs.

Editing an Account

Although the process of creating a new account is swift and simple, it doesn't offer you much in the way of flexibility. You don't even have a chance to specify the new person's password, let alone the tiny picture that appears next to the person's name and at the top of the Start menu (rubber ducky, flower, or whatever).

That's why the next step in creating an account is usually *editing* the one you just set up. To do so, once you've returned to the main User Accounts screen (Figure 16-1), click the name or icon of the freshly created account. You arrive at the screen shown at top in Figure 16-3, where—if you are an administrator—you can choose from any of these options:

- **Change the name.** You'll be offered the opportunity to type in a new name for this person and then click the Change Name button—just the ticket when one of your co-workers gets married or joins the Witness Protection Program.
- **Create a password.** Click this link if you'd like to require a password for access to this person's account (Figure 16-3, bottom). Capitalization counts.

  The usual computer book takes this opportunity to stress the importance of having a long, complex password, such as a phrase that isn't in the dictionary, something made up of mixed letters and numbers, and *not* "password." This is excellent advice if you create sensitive documents and work in a big corporation.

  But if you share the PC only with a spouse or a few trusted colleagues in a small office, for example, you may have nothing to hide. You may see the multiple-users feature more as a convenience (for keeping your settings and files separate) than a way of protecting secrecy and security.

  In these situations, there's no particular need to dream up a convoluted password. In fact, you may want to consider setting up *no* password—leaving both password blanks empty. Later, whenever you're asked for your password, just leave the Password box blank. You'll be able to log on that much faster each day.

  If you do decide to provide a password, you can also provide a hint (for yourself or whichever co-worker's account you're operating on). This is a hint that anybody can see (including bad guys trying to log on as you), so choose something meaningful only to you. If your password is the first person who ever kissed you

EX 2009

plus your junior-year phone number, for example, your hint might be "first person who ever kissed me plus my junior-year phone number."

Later, if you ever forget your password, you'll be offered an opportunity to view this hint at sign-in time to jog your memory.

Note: It's fine for you, an administrator, to create the *original* passwords for new accounts. But don't change their passwords later on, after they've been using the computer for a while. If you do, you'll wipe out various internal security features of their accounts, including access to their stored Web site passwords and stored passwords for shared folders and disks on the network. See the box on page 498 for details.

- **Make your files private.** The first time you make up a password for your own account, another screen asks: "Do you want to make your files and folders private?" If you're using the accounts feature more for convenience than for security—if

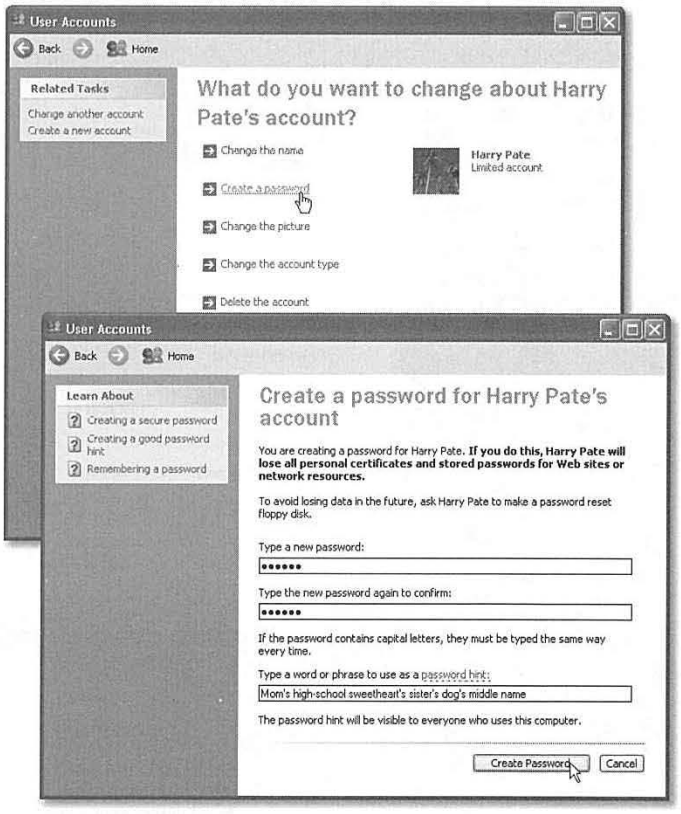


Figure 16-3:
Top: Here's the master menu of account changing options that you, an administrator, can see. (If you're a Limited account holder, you see far fewer options.)

Bottom: You're supposed to type your password twice, to make sure you didn't introduce a typo the first time. (The PC shows only dots as you type, to guard against the possibility that some villain is snooping over your shoulder.)

EX 2009

you and your co-worker are married and have no secrets from each other, for example—click No.

Note: The private-folder feature is available only on hard drives you've formatted using the *NTFS* scheme, as described on page 462.

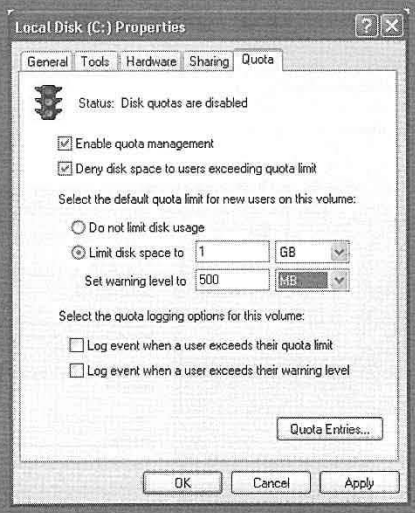
But if you click the button labeled "Yes, Make Private," Windows takes a minute to mark everything in your *user profile folder* off-limits to other account holders. (Your user profile folder is the one bearing your name in the Documents and Settings folder on your hard drive.) Henceforth, if anyone else tries to open any of

POWER USERS' CLINIC

Disk Quotas

Does one of your account holders have a tendency to become a bit overzealous about downloading stuff from the Web, threatening to overrun your hard drive with shareware junk and MP3 files? Fortunately, it's easy enough for you, the wise administrator, to curb such behavior among holders of Limited accounts (if your drive uses NTFS formatting, as described on page 462).

Just choose Start→My Computer. Right-click the hard drive icon; in the Properties dialog box, click the Quota tab (shown here). Turn on "Enable quota management" to un-dim the other options.



You might start by turning on "Deny disk space to users exceeding quota limit." This, of course, is exactly the kind of muzzle you were hoping to place on out-of-control downloaders. The instant they try to save or download a file that pushes their stuff over the limit, an "Insufficient disk space" message appears. They'll simply have to delete some of their other files to make room.

Use the "Limit disk space to ___" controls to specify the cap you want to put on each account holder. Using these controls, you can specify a certain number of kilobytes (KB), megabytes (MB), gigabytes (GB)—or even terabytes (TB), petabytes (PB), or exabytes (EB). (Then write a letter to *PC World* and tell the editors where you even bought a multi-exabyte hard drive.)

You can also set up a disk-space limit ("Set warning level to ___") that will make a warning appear—not to the mad downloader, but to you, the administrator. By clicking the Quota Entries button, you get a little report that shows exactly how much disk space each of your account holders has used up. (This is where you'll see the warning, as a written notation.)

You may have noticed that Windows lets you set a space limit (and a warning) even if "Enable quota management" isn't turned on. You'd set things up that way if you just want to track your underlings' disk usage without actually limiting them.

When you click OK, Windows warns you that it's about to take some time to calculate just how much disk space each account holder has used so far.

EX 2009

your files or folders (when they're logged in under their own names), they'll get nothing but a curt "Access is denied" message.

(Technically, making a folder private even shields it from the eyes of the machine's Administrator account holders—but it's a pretty flimsy shield. A determined administrator can burrow past this wisp of protection to examine your files, if she's determined to do so, or even change your password late one night to gain full access to your stuff.)

Note that even if you do make your files and folders private, you'll still be able to share selected files and folders with other people. You just put them into the Shared Documents folder described on page 529.

Tip: You can make *any* of your own folders private—or un-private, for that matter. Just right-click the folder; from the shortcut menu, choose Properties; click the Sharing tab; and turn "Make this folder private" on or off.

To make your entire world un-private, for example, you'd perform this surgery on your *user profile folder* in the Documents and Settings folder (page 490).

- **Change the picture.** The usual Windows XP sign-in screen (Figure 16-8) displays each account holder's name, accompanied by a little picture. When you first create the account, however, it assigns a picture to you at random—and not all of them are necessarily appropriate for your personality. Not every extreme-sport headbanger, for example, is crazy about being represented by a dainty flower or butterfly.

  If you like the selections that Microsoft has provided (drag the vertical scroll bar to see them all), just click one to select it as the replacement graphic. If you'd rather use some other graphics file on the hard drive instead—a digital photo of your own face, for example—you can click the "Browse for more pictures" link (Figure



Figure 16-4: *Right: Here's where you change your account picture, the one that appears on the Welcome screen and atop your Start menu.*

Tip: If you like to change your picture whenever your mood changes, there's a shortcut to this dialog box. Just click your account picture at the top of the open Start menu (left).

EX 2009

16-4). You'll be shown a list of the graphics files on your hard drive so that you can choose one, which Windows then automatically scales down to postage-stamp size (48 pixels square).

- **Change the account type.** Click this link to change a Limited account into an Administrator account, or vice versa. You might want to use this option, for example, after upgrading a Windows 98 or Windows Me computer to Windows XP—a process that otherwise leaves all existing user accounts as Administrator accounts.
- **Delete the account.** See page 498.

You're free to make any of these changes to any account at any time; you don't have to do it just after first creating the account.

Tip: If the User Accounts program looks nothing like the illustrations in this chapter so far, it's probably because you have only a Limited account. In that case, opening User Accounts in the Control Panel offers only a few certain links: "Create a password" (or "Change my password"), "Change my picture," and "Set up my account to use a .NET Passport" (see page 358). Only a computer administrator can make the other kinds of changes described here.

UP TO SPEED

Passwords Within Passwords

The primary password that you or your administrator sets up in the User Accounts program has two functions. You already know that it lets you log on each day, so that you can enter your Windows world of desktop clutter, Start-menu tailoring, Web bookmarks, and so on.

But what you may not realize is that it's also the master key that unlocks all the *other* passwords associated with your account: the passwords that Internet Explorer memorizes for certain Web sites, the passwords that get you into shared disks and folders on the network, the password that protects your .NET Passport (and its Wallet for electronic payments, if you set one up), and so on. The simple act of logging onto your account also unlocks all of these other secure areas of your PC life.

But remember that anyone with an Administrator account can *change* your password at any time. Does that mean that whoever has an Administrator account—your teacher, boss, or teenager, for example—has full access to your private stuff? After you leave the household, company, or school, what's to stop an administrator from changing your password, thereby gaining access to your electronic-brokerage account (courtesy of its memorized Internet Explorer password), buying stuff with your Passport Wallet, and so on?

Fortunately, Microsoft is way ahead of you on this one. The instant an administrator changes somebody else's password, Windows XP *wipes out* all secondary passwords associated with the account. That administrator can log onto your account and see your everyday files, but not Web sites with memorized passwords, and so on.

Note that if you change your *own* password—or if you use a Forgotten Password Disk, described next—none of this applies. Your secondary passwords survive intact. It's only when *somebody else* changes your password that this little-known Windows XP security feature kicks in, sanitizing the account for your protection.

EX 2009

The Forgotten Password Disk

As described later in this chapter, Windows XP contains a handy hint mechanism for helping you recall your password if you've forgotten it: the little ? icon that appears after you click your name on the Welcome screen. When you click that little icon, you're shown the hint that you provided for yourself—*if* you provided one—when setting up your account.

But what if, having walked into a low-hanging branch, you've completely forgotten both your password and the correct interpretation of your hint? In that disastrous situation, your entire world of work and email would be locked inside the computer forever. (Yes, an administrator could issue you a new password—but as noted in the box on the facing page, you'd lose all your secondary passwords in the process.)

Fortunately, Windows XP offers a clever solution-in-advance: the Password Reset Disk. It's a floppy disk that you can use like a physical key to unlock your account, in the event of a forgotten password. The catch: You have to make this disk *now,* while you still remember your password.

To create this disk, choose Start→Control Panel. Open the User Accounts program. If you're an administrator, click your account name; if not, you can skip this step.

Either way, you should now see a link in the task pane called, "Prevent a forgotten password." Click that to open the Forgotten Password Wizard shown in Figure 16-5.

When the day comes that you can't remember your password, your attempts to get past the logon screen will be met by a "Use your Password Reset Disk" link. (If you've



Figure 16-5: *The screens of this wizard guide you through the process of inserting a blank floppy disk and preparing it to be your master skeleton key. If you forget your password–or if some administrator has changed your password–you can use this disk to reinstate it without the risk of losing all of your secondary passwords (memorized Web passwords, encrypted files, and so on).*

EX 2009

turned off the standard Welcome screen shown at top in Figure 16-8, you'll see a Reset button instead.)

When you click that link or button, Windows asks you to insert your Password Reset Disk, and then gives you the opportunity to create a new password (and a new hint to remind you of it). You're in.

Even though you now have a new password, your existing Password Reset Disk will still be good. Keep it in a drawer somewhere, for use the next time you experience a temporarily blank brain.

Deleting User Accounts

It happens: somebody graduates, somebody gets fired, somebody dumps you. Sooner or later, you may need to delete a user account from your PC.

To delete a user account, you, an administrator, must open the User Accounts program, click the appropriate account name, and then click "Delete the account."

Windows XP now asks you if you want to preserve the contents of this person's My Documents folder. If you click the Keep Files button, you'll find a new folder, named for the dearly departed, on your desktop. (As noted in the dialog box, only the documents, contents of the desktop, and the My Documents folder are preserved—but

FREQUENTLY ASKED QUESTION

The "Run as" Command: Limited Unlimited

OK, OK, I get it: for maximum security, it's best to create Limited accounts for the people who use my PC. But I've got this program, Beekeeper Pro, that doesn't work right under a Limited account. Now what?

Unfortunately, you have only two alternatives, and neither is particularly convenient.

First, whenever a Limited account holder encounters a place where administrator powers are required, he doesn't actually have to log out so that you, the administrator, can log on and make changes. Instead, he can just call you over to the PC. He can then right-click the icon of the problem program and, from the shortcut menu, choose "Run as."



The dialog box shown here appears. You, the administrator, should click "The following user," and then fill in your own name and password—if, indeed, you feel comfortable permitting your peon limited user to proceed. As far as Windows (and the specific program in question) is concerned, that limited user is now officially an administrator.

That, of course, is a one-shot, temporary solution—a routine that will grow old fast if the limited user has to use that recalcitrant program every single day. In that case, you may have no alternative but to upgrade your colleague to an Administrator account, despite the security downsides.

EX 2009

not programs, email, or even Web favorites.) If that person ever returns to your life, you can create a new account for him and copy these files into the appropriate folder locations.

If you click the Delete Files button, on the other hand, the documents are gone forever.

A few more important points about deleting accounts:

- You can't delete the account you're already using.
- You can't delete the last Administrator account. One account must always remain.
- You can create a new account with the same name and password as one that you deleted earlier, but in Windows XP's head, it's still not the same account. As described in the box on page 498, it won't have any of the original secondary passwords (for Web sites, shared folders, and so on).
- Don't manipulate accounts manually (by fooling around in the Documents and Settings folder, for example). Create, delete, and rename them only using the User Accounts program in the Control Panel. Otherwise, you'll wind up with duplicate or triplicate folders in Documents and Settings, with the PC name tacked onto the end of the original account name (Bob, Bob.MILLENNIA, and so on)—a sure recipe for confusion.

Tip: If you're an administrator, don't miss the Users tab of the Task Manager dialog box (press Ctrl+Alt+Delete to open it). It offers a handy, centralized list of everybody who's logged into your machine—even those who have dialed in from the road, as described in Chapter 18—and buttons that let you log them off, disconnect them, or even make a little message pop up on their screens. All of this can be handy whenever you need some information, a troubleshooting session, or a power trip.

Setting Up the Logon Process

Once you've set up more than one account, the dialog box that greets you when you turn on the PC (or when you relinquish your turn at the PC by choosing Start→Log Off) looks something like Figure 16-8. But a few extra controls let you, an administrator, set up the logon screen for either more or less security—or, put another way, less or more convenience.

Open the User Accounts program in the Control Panel, and then click "Change the way users log on or off." As shown in Figure 16-6, Windows XP now offers you two extremely important logon options.

"Use the Welcome Screen"

Under normal circumstances, the logon screen presents a list of account holders when the PC is first turned on, as shown in Figure 16-8.

EX 2009

If you're especially worried about security, however, you might not even want that list to appear. If you turn off "Use the Welcome screen," each person who signs in must type both his name *and* password into blank boxes—a very inconvenient, but secure, arrangement (Figure 16-7). (You can't turn off "Use the Welcome screen" if Fast User Switching is turned on, as described in the next section.)

Tip: Strangely enough, even when you're looking at the standard Welcome screen (Figure 16-8), you can switch to the Classic logon screen: just press Ctrl+Alt+Delete. (If you're having trouble making it work, try pressing down the Alt key before the other ones.)

You may be used to using the Ctrl+Alt+Delete keystroke for summoning the Task Manager, as described on page 150; but at the Welcome to Windows box, it means something else entirely.

"Use Fast User Switching"

If you've used any version of Windows before, the business about separate user accounts for everybody who uses a certain PC is old hat. One aspect of this feature,

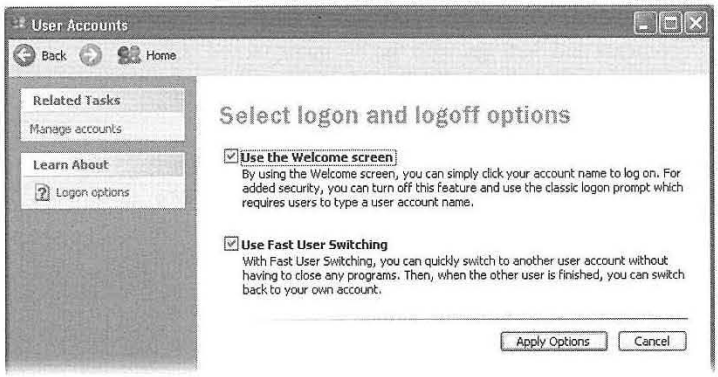


Figure 16-6: *These two options have enormous ramifications. The first governs the appearance of the Welcome screen shown in Figure 16-8. The second lets one person duck into his own account without forcing you to log off, as described on page 502. These options are related—you can't turn off the first without first turning off the second.*

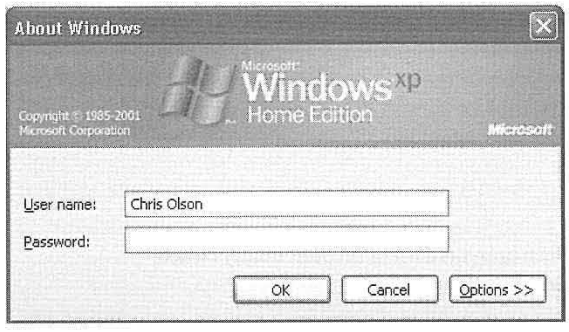


Figure 16-7: *If you turn off the new Welcome screen, you sign into Windows XP just as Windows 2000 fans have for years. You're expected to type in your name and password and then click OK.*

EX 2009

however, is dramatically new in Windows XP—and extremely welcome: *Fast User Switching*.

How Fast User Switching works

Suppose you're signed in, and you've got things just the way you like them: you have eleven programs open in carefully arranged windows, your Web browser is downloading some gigantic file, and you're composing an important speech in Microsoft Word. Now Chris, a co-worker/family member/fellow student, wants to duck in to do a quick email check.

In the old days, you might have rewarded Chris with eye-rolling and heavy sighs—or a reaction even less suitable for a family book. If you chose to accommodate the request, you would have had to shut down your whole ecosystem, interrupting the download, closing your windows, saving your work and exiting your programs. You would have had to log off completely.

If Fast User Switching is turned on, however, none of that is necessary. All you have to do is press the magic keystroke, Windows logo key+L. (Or, if you've misplaced your keyboard, you can choose Start→Log Off, and then click Switch User in the Log Off dialog box.)

Now the Welcome screen appears, ready for the next person to sign in. Looking at the screen now, you may *think* you've just logged off in the usual way.

NOSTALGIA CORNER

The Double-Thick Security Trick

Most people who are used to using Windows 2000 in a corporation see the startup box shown here when they first turn on the machine. They don't proceed to the Classic logon box (Figure 16-7) until they first press Ctrl+Alt+Delete.



Believe it or not, this somewhat inconvenient setup is intended as a security feature. By forcing you to press Ctrl+Alt+Delete to bypass the initial Welcome box, you rule out the possibility that some sneaky program (such as a Trojan horse program), designed to *look* like the Classic logon box, is posing *as* the Classic logon box—in order to "capture" the name and password you type there.

This two-layer logon system is still available in Windows XP Home Edition, but you have to do a little digging to find it. Choose Start→Run; type *control Userpasswords2*, and then press Enter. You see the program shown on page 491—the old-style User Accounts box. Click the Advanced tab.

At the bottom of the Advanced tab, turn on "Require users to press Ctrl+Alt+Delete," and then click OK. From now on, turning on the PC greets you not with a logon screen, but with the un-fakeable Welcome box shown here. (Of course, this presumes you've also turned off "Use Welcome screen," as shown in Figure 16-6.)

EX 2009

But look at it closely (Figure 16-8): You haven't actually logged off at all. Instead, Windows has *memorized* the state of affairs in your account—complete with all open windows, documents, and programs—and shoved it into the background. Chris (or whoever) can now sign in normally, do a little work, or look something up. When Chris logs out again, the Welcome screen comes back once again, at which point *you* can log on again. Without having to wait more than a couple of seconds, you find yourself exactly where you began, with all programs and documents still open and running.

Note: When you're logged in under Fast User Switching, you're not allowed to open a file that's open in somebody else's account universe. An "Access is denied" message will tell you so.

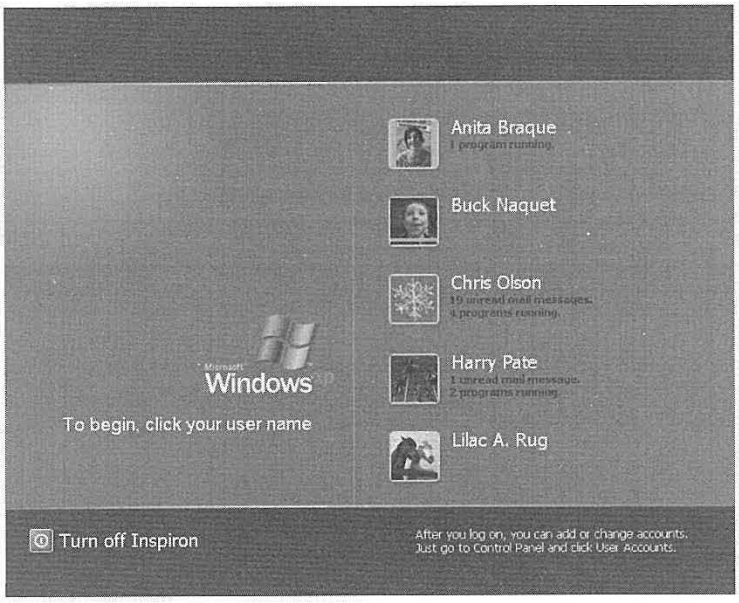


Figure 16-8: *When Fast User Switching is turned on, you can call up the Welcome screen shown here without even quitting your programs and closing your windows. If Outlook Express or Windows Messenger is running, the Welcome screen even shows you how many unread email messages are waiting for you. (Point without clicking to produce a tooltip that breaks down which email accounts they came in on.)*

This feature requires a good deal of memory, of course (don't even think about it on a machine with less than 96 MB of RAM). Otherwise, however, it's an enormous timesaver.

Tip: If Fast User Switching is turned *off*, its special keystroke–Windows logo key+L–is still special. Now it *locks* your PC, hiding all of your open programs and windows. The only thing on the screen is an Unlock Computer dialog box (which looks almost exactly like the one shown in Figure 16-8). At this point, nobody can even get into the machine except you or somebody with an Administrator account.

EX 2009

How to turn on Fast User Switching

To turn on this optional feature, open the User Accounts program in the Control Panel. Click "Change the way users log on or off"; the dialog box shown in Figure 16-6 appears. Make sure "Use the Welcome screen" is turned on (it's a requirement for Fast User Switching), and then turn on "Use Fast User Switching." Finally, click the Apply Options button.

Note: You can't turn Fast User Switching off if anybody else's account is still open in the background. Before you can turn off the feature, you must first switch to each account in turn (press Windows key+L) and then sign off from each account.

From now on, you have two options each time you decide that you're finished working for the moment. You can log off normally, closing all of your programs and windows—or you can *fast switch*, logging off temporarily, leaving your work open on the screen behind the scenes. Figure 16-9 shows you the difference.

Tip: Here's the power user's version of Fast User Switching (Administrator account required). Press Ctrl+Alt+Delete to open the Task Manager dialog box, whose Users tab reveals the list of logged-on accounts. Right-click the account you want, choose Connect from the shortcut menu, and *boom!*—you're switched. You don't even have to listen to the two-note musical switching theme.



Figure 16-9:
Top: If you choose Start→Log Off when Fast User Switching is turned off, you get this limited dialog box.

Bottom: When you choose Start→ Log Off while Fast User Switching is turned on, you get this choice: you can either log off for real (click Log Off), or use Fast User Switching to cede control of the computer to another account holder and put your work into background memory (click Switch User).

EX 2009

Logging On

Once your account is set up, here's what it's like getting into, and out of, a Windows XP machine.

Identifying Yourself

When it comes to the screens you encounter when you log on to a Windows XP computer, your mileage may vary. What you see depends on how your PC has been set up. For example:

You zoom straight to the desktop.
If you are the sole account holder, and you've set up no password at all for yourself, you cruise all the way to the desktop without any stops.

This password-free scenario, of course, is not very secure; any evildoer who walks by your machine when you're in the bathroom has complete access to all of your files (and all of your password-protected Web sites). But if you work in a home office, for example, where the threat of privacy invasion isn't very great, it's by far the most convenient arrangement.

You get the Log On to Windows dialog box.
If you've turned off "Use Welcome screen" (page 501), you don't get the usual Welcome screen shown in Figure 16-8 at startup. Instead, you must *type in* your name, as shown in Figure 16-7, rather than simply clicking it in a user-friendly list. (If you were the last person to use the machine, you might not have to type in the name, because Windows automatically fills the box with the name of the most recent user.)

You get the standard Welcome screen.
This, of course, is what most people see most of the time (Figure 16-8).

At this moment, you have several alternatives. If you click the "Turn off [computer name]" button (in the lower-left corner of the screen)—maybe in a sudden panic over the amount of work you have to do—you'll be offered the "Turn off computer" dialog box. It contains Stand By, Turn Off, Restart, and Cancel buttons. (If you press the Shift key, the Stand By button becomes a Hibernate button, as described on page 27.)

Otherwise, to sign in, click your account name in the list. If no password is required for your account, you proceed to your personal Windows world with no further interruption.

If there *is* a password associated with your account, you'll see a place for it (Figure 16-10). Type your password and then press Enter (or click the green arrow button.)

There's no limit to the number of times you can try to type in a password; with each incorrect guess, a tooltip balloon appears, tactfully inquiring, "Did you forget your password?" It reminds you that capitalization counts.

EX 2009

Tip: If your Caps Lock key is pressed, another balloon lets you know. Otherwise, because you can't see anything on the screen as you type except dots, you might be trying to type a lowercase password with all capital letters.



Figure 16-10: *If you can't remember the password, click the ? icon. A balloon reminds you of your password hint. And if you still can't remember your password, it's time to take out the Forgotten Password Disk you wisely made while reading page 498.*

Shared Folders

As described earlier in this chapter, the mere act of assigning a password to your user account triggers Windows XP—with your approval—to make all of your files and folders private, so that no other account holders can access them.

If you try to open anybody else's files or folders, you see a dialog box so nice, it tells you twice: "[This folder] is not accessible. Access is denied."

That's all well and good if you'd just as soon your fellow PC users keep their noses out of your stuff. But it doesn't bode well for the kinds of exciting collaboration that computers are supposed to make possible. If your worlds are completely separate, how can you collaborate on a document? What are you supposed to do, email the thing to another account on the exact same computer?

Fortunately, Microsoft has that particular problem licked, thanks to the presence of the *Shared Documents* folder. To find it, just choose Start→My Computer (Figure 16-11). (You might consider making a shortcut of it on your desktop or Start menu.)

Anything you put into this folder is available for inspection, editing, or deleting by anyone else who uses this PC. It's the common ground among all the account holders. It's Central Park, the farmer's market, and the grocery-store bulletin board.

Tip: You can also create other shared folders, either inside the Shared Documents folder or anywhere you like. The trick: Right-click the folder you want to make public. From the shortcut menu, choose Sharing and Security, if that's an option. (If not, choose Properties and then click the Sharing tab.) In the resulting dialog box, turn off "Make this folder private," and then click OK.

(As the dialog box makes clear, however, you can't turn off the "private" setting for a folder that's inside *another* "private" folder.)

EX 2009

The Guest Account

Actually, Administrator and Limited aren't the only kinds of accounts you can set up on your PC. The third kind, called the Guest account, is ideal for situations where somebody is just visiting you for the day. Rather than create an entire account for this person, complete with password, hint, little picture, and so on, you can just switch on the Guest account.

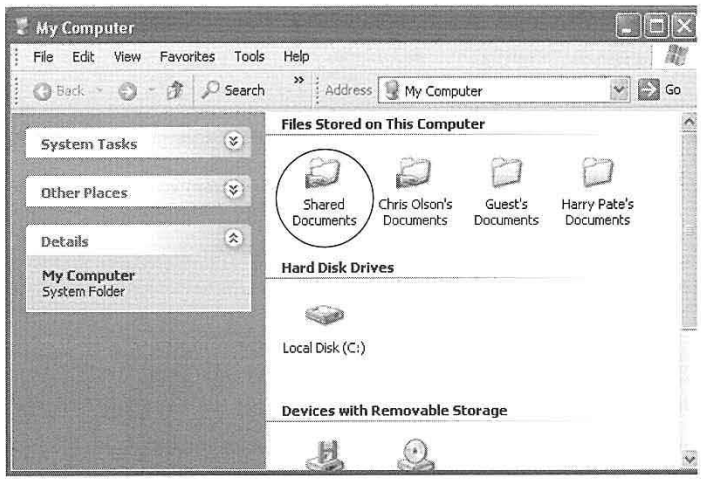


Figure 16-11: *The Shared Documents folder contains files that you're welcome to open, read, and copy to your own folders—stuff that other people have wanted to "publish" for the benefit of their co-workers. You can think of it as sort of a wormhole connecting all accounts. Everybody has full access to everything inside.*

To do so, open the User Accounts program in the Control Panel. If you're an administrator, you'll see an icon for the Guest account at the bottom of the screen (Figure 16-12). Click it; on the next screen, click the button labeled Turn On the Guest Account. That's all there is to it.

When the visitor to your office is finally out of your hair, healthy paranoia suggests that you turn off the Guest account once again. (To do so, follow precisely the same steps, except click Turn Off the Guest Account in the final step.)

The Administrator Account

It may come as a surprise that Windows XP provides one more, very special account: an emergency, backup account with full administrator powers. Even if you delete all of your other accounts, this one will still remain, if nothing else so that you have some way to get into your machine. It's an Administrator account *called* Administrator, and it's ordinarily hidden.

In fact, there's only one time you'll see it: in times of troubleshooting, when you start up your PC in Safe Mode (page 482). It's the ideal account to use in those situ-

EX 2009