CC stands for *carbon copy*. There's very little difference between putting all your addressees on the "To:" line (separated by semicolons) and putting them on the "CC:" line; the only difference is that your name in the "CC:" line implies, "I sent you a copy because I thought you'd want to know about this correspondence, but I'm not expecting you to reply."

Once again, use the address book to quickly type in these names, and be sure to separate email addresses with semicolons. Press Tab when you're finished.

3. **Type the topic of the message in the "Subject:" field.**

Some people, especially those in the business world, get bombarded with email. That's why it's courteous to put some thought into the Subject line (use "Change in plans for next week" instead of "Hi," for example).

Press the Tab key to move your cursor into the large message-body area.

4. **Choose a format (HTML or plain text), if you like.**

When it comes to formatting a message's body text, you have two choices: *plain text* or *HTML* (Hypertext Markup Language).

Plain text means that you can't format your text with bold type, color, specified font sizes, and so on. HTML, on the other hand, is the language used to create Web pages, and it lets you use formatting commands (such as font sizes, colors, and bold

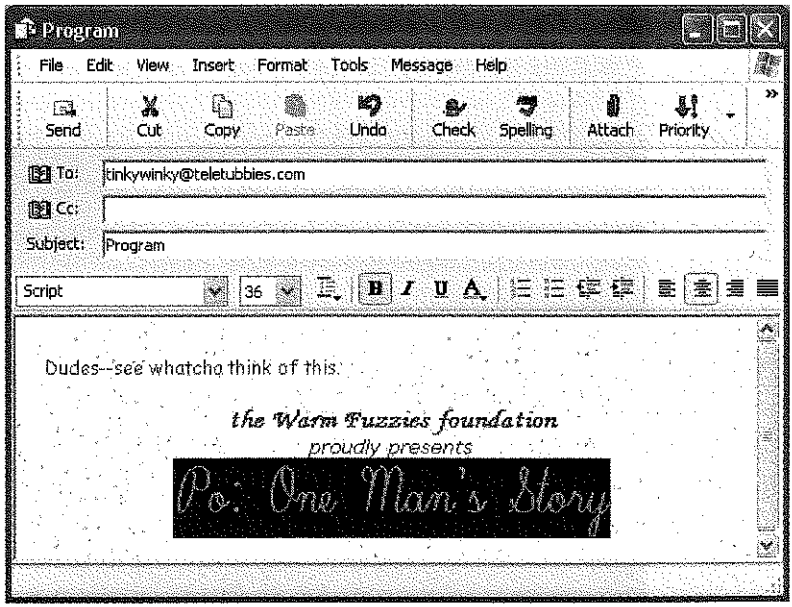


Figure 12-3: *HTML-based email lets you exercise some control over the layout of your email messages, including text colors, font selection, and text alignment. The HTML toolbar looks and acts like a toolbar that you might find in a word processing program. With it, you can turn plain-lane email into an HTML-formatted wonderland.*

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or italic text). But there's a catch: Some email programs can't read HTML-formatted email, and HTML mail is much larger, and therefore slower to download, than plain-text messages. (For that reason, it really irritates many computer pros.)

So which should you choose? Plain text tends to feel a little more professional, never irritating anybody—and you're guaranteed that the recipient will see exactly what was sent. If you send an HTML message to someone whose email program can't handle HTML, all is not lost—your message appears in a friendly, plain-text format at the top, and then again at the bottom, cluttered with HTML codes.

To specify which format Outlook Express *proposes* for all new messages (plain text or HTML), choose Tools→Options. Click the Send tab. Then, in the section labeled Mail Sending Format, choose either the HTML or Plain Text button, and then click OK.

No matter which setting you specify there, however, you can always switch a particular message to the opposite format. Just choose Format→Rich Text (HTML), or Format→Plain Text.

If you choose the HTML option, clicking in the message area activates the HTML toolbar, whose various buttons control the formatting, font, size, color, paragraph indentation, line spacing, and other word processor–like formatting controls.

One thing to remember: Less is more. If you go hog-wild formatting your email, the message may be difficult to read. Furthermore, since most *junk* email is formatted using HTML codes, using HTML formatting may route your message into some people's Junk Mail folders.

5. **Enter the message in the message box (the bottom half of the message window).**

UP TO SPEED

Blind Carbon Copies

A *blind carbon copy* is a secret copy. This feature lets you send a copy of a message to somebody secretly, without any of the other recipients knowing. The names in the "To:" and "CC:" fields appear at the top of the message for all recipients to see, but nobody can see the names you typed into the BCC: box. To view this box, choose View→All Headers.

You can use the "BCC:" field to quietly signal a third party that a message has been sent. For example, if you send your co-worker a message that says, "Chris, it bothers me that you've been cheating the customers," you could BCC your boss or supervisor to clue her in without getting into trouble with Chris.

The BCC box is useful in other ways, too. Many people send email messages (containing jokes, for example) to a long list of recipients. You, the recipient, must scroll through a very long list of names the sender placed in the "To:" or "CC:" field.

But if the sender used the "BCC:" field to hold all the recipients' email addresses, you, the recipient, won't see any names but your own at the top of the email. (Unfortunately, spammers—the miserable cretins who send you junk mail—have also learned this trick.)

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You can use all standard editing techniques, including Cut, Copy, and Paste, to rearrange the text as you write it.

Tip: If Microsoft Word is installed on your PC, you can also spell-check your outgoing mail—just choose Tools→Spelling (or press F7) in the new message window.

6. **Add a signature, if you wish.**

   Signatures are bits of text that get stamped at the bottom of outgoing email messages. They typically contain a name, a mailing address, or a Monty Python quote. (In fact, some signatures are longer than the messages they accompany.)

   To create a signature, choose Tools→Options, click the Signatures tab, and then click the New button. The easiest way to compose your signature is to type it into the Edit Signatures text box at the bottom of the window. (If you poke around long enough in this box, you'll realize that you can actually create multiple signatures—and assign each one to a different outgoing email account.)

   Once you've created a signature (or several), you can tack it onto your outgoing mail for all messages (by turning on "Add signatures to all outgoing messages" at the top of this box) or on a message-by-message basis (by choosing Insert→Signature in the New Message window).

7. **Click the Send button.**

   Alternatively, press Alt+S, or choose File→Send Message. Your PC connects to the Internet and sends the message.

If you'd rather have Outlook Express place each message you write in the Outbox folder instead of connecting to the Net each time you click the Send button, see "Send tab," on page 398. There you'll discover how to make Outlook Express quietly collect your outgoing mail—until you click the Send/Recv button on the toolbar, that is.

The Address Book

Accumulating names in an address book—the same one described on page 196—eliminates the need to enter complete email addresses whenever you want to send a message. Click the Addresses button on the toolbar; then, to begin adding names and email addresses, click New.

Tip: Outlook Express offers a convenient timesaving feature: the Tools→Add Sender to Address Book command. Whenever you choose it, Outlook Express automatically stores the email address of the person whose message is on the screen. (Alternatively, you can right-click an email address in the message and choose "Add to Address Book" from the shortcut menu.)

Attaching files to messages

Sending little text messages is fine, but it's not much help when you want to send somebody a photograph, a sound recording, a Word or Excel document, and so on.

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Fortunately, attaching such files to email messages is one of the world's most popular email features.

To attach a file to a message, use either of two methods:

- **The long way.** Click the Attach button on the New Message dialog box toolbar. When the Insert Attachment dialog box opens, navigate the folders on your drive to locate the file and select it. (In the resulting navigation window, Ctrl-click multiple files to attach them all at once.)

  When you click the Attach button, the name of the attached file appears in the message in the Attach text box. (In fact, you can repeat this process to send several attached files with the same message.) When you send the message, the file tags along.

Note: If you have a high-speed connection like a cable modem, have pity on your recipients if they don't. A big picture or movie file might take you only seconds to send, but tie up your correspondent's modem for hours. If you intend to send a photo, for example, use the technique described on page 219, and take advantage of XP's offer to scale down the image to emailable size before sending it.

- **The short way.** If you can see the icon of the file you want to attach—in its folder window behind the Outlook Express window—then attach it by *dragging* its icon directly into the message window. That's a handy technique when you're attaching many different files.

Tip: To remove a file from an outgoing message before you've sent it, right-click its icon and choose Remove from the shortcut menu—or just left-click it and then press the Delete key.

Reading Email

Just seeing a list of the *names* of new messages in Outlook Express is like getting wrapped presents; the best part is yet to come. There are two ways to read a message: using the preview pane, and opening the message into its own window.

To preview a message, click its name in the list pane; the body of the message appears in the preview pane below. Don't forget that you can adjust the relative sizes of the list and preview panes by dragging the gray border between them up or down.

To open a message into a window of its own, double-click its name in the list pane. An open message has its own toolbar, along with Previous and Next message buttons.

Regardless of your viewing preference, any attached pictures, sounds, or movies *also* appear in the body of the message; what's more, these sounds and movies can be played in the email message itself.

Once you've read a message, you can view the next one in the list either by pressing Ctrl +right arrow (for the next message) or Ctrl +U (for the next *unread* message),

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or by clicking its name in the list pane. (If you're using preview mode, and haven't opened a message into its own window, you can also press the up or down arrow key to move from one message to the next.)

Tip: To mark a message that you've read as an *unread* message, so that its name remains bolded, right-click its name in the list pane and choose Mark as Unread from the shortcut menu.

Here's another timesaver: To hide all the messages you've already read, just choose View→Current View→Hide Read Messages. Now, only unread messages are visible in the selected folder. To bring the hidden messages back, choose View→Current View→Show All Messages.

How to Process a Message

Once you've read a message and savored the feeling of awe brought on by the miracle of instantaneous electronic communication, you can process the message in any of several ways.

Deleting messages

Sometimes it's junk mail, sometimes you're just done with it; either way, it's a snap to delete a message. Just click the Delete button on the toolbar, press the Delete key, or choose Edit→Delete. (You can also delete a batch of messages simultaneously by highlighting the entire group and then using the same button, menu command, or keystroke.)

Either way, the message or messages don't actually disappear, just as moving a file icon to the Recycle Bin doesn't actually delete it. Instead, these commands move the messages to the Deleted Items folder; if you like, click this folder to view a list of the messages you've deleted. You can even rescue some simply by dragging them into another folder (such as right back into the Inbox).

Outlook Express doesn't truly vaporize messages in the Deleted Items folder until you "empty the trash." You can empty it in any of several ways:

UP TO SPEED

Selecting Messages

In order to process a group of messages simultaneously–to delete, move, or forward them, for example–you must first master the art of multiple message selection.

To select two or more messages that appear consecutively in your message list, click the first message, then Shift-click the last. Known as a *contiguous selection*, this trick selects every message between the two that you clicked.

To select two or more messages that *aren't* adjacent in the list (that is, skipping a few messages between selected ones), Ctrl-click the messages you want. Only the messages you click get selected–no filling in of messages in between, this time.

After using either technique, you can also *deselect* messages you've managed to highlight–just Ctrl-click them again.

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- Right-click the Deleted Items folder. Choose "Empty 'Deleted Items' Folder" from the shortcut menu.
- Click a message, or a folder, within the Deleted Items Folder list and then click the Delete button on the toolbar (or press the Delete key). You'll be asked to confirm its permanent deletion.
- Set up Outlook Express to delete messages automatically when you quit the program. To do so, choose Tools→Options. On the Maintenance tab, turn on "Empty messages from the 'Deleted Items' folder on exit." Click OK.

Replying to Messages

To reply to a message, click the Reply button in the toolbar, or choose Message→Reply to Sender, or press Ctrl+R. Outlook Express creates a new, outgoing email message, preaddressed to the sender's return address.

To save additional time, Outlook Express pastes the entire original message at the bottom of your reply (complete with the > brackets that serve as Internet quoting marks); that's to help your correspondent figure out what you're talking about. (To turn off this feature, choose Tools→Options, click the Send tab, and turn off "Include message in reply.") Outlook Express even tacks *Re:* ("regarding") onto the front of the subject line.

Your cursor appears at the top of the message box; now begin typing your reply. You can also add recipients, remove recipients, edit the subject line or the message, and so on.

Tip: Use the Enter key to create blank lines within the bracketed original message in order to place your own text within it. Using this method, you can splice your own comments into the paragraphs of the original message, replying point by point. The brackets preceding each line of the original message help your correspondent keep straight what's yours and what's hers.

Note, by the way, that there are three kinds of replies, each represented by a different icon on the toolbar:

UP TO SPEED

About Mailing Lists

During your email experiments, you're likely to come across something called a mailing list—a discussion group conducted via email. By searching Yahoo (*www.yahoo.com*) or other Web directories, you can find mailing lists covering just about every conceivable topic.

You can send a message to all members of such a group by sending a message to a single address—the list's address. The list is actually maintained on a special mail server. Everything sent to the list gets sent to the server, which forwards the message to all of the individual list members. That's why you have to be careful when you think you're replying to *one person* in the discussion group; if you reply to the list and not to a specific person, you'll be sending your reply to every address on the list—sometimes with disastrous consequences.

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- A **standard reply** goes to the sender of the message (click the Reply button). If that sender is a mailing list (see the sidebar box below), then the message gets sent to the *entire* mailing list, which has gotten more than one unsuspecting novice PC fan into trouble.
- **Reply Group** (available only when you're reading newsgroup messages) creates a reply intended for the entire Internet—that is, everyone who reads this newsgroup. (By contrast, click Reply to shoot a private note to only one person: the person who typed the message.)
- The **Reply To All** button addresses a message to all recipients of the original message, including any CC recipients. This is the button to use if you're participating in a group discussion of some topic. For example, six people can simultaneously carry on an email correspondence, always sending each response to the other five in the group.

Forwarding Messages

Instead of replying to the person who sent you a message, you may sometimes want to *forward* the message—pass it on—to a third person.

To do so, click the Forward button in the toolbar, choose Message→Forward, or press Ctrl+F. A new message opens, looking a lot like the one that appears when you reply. Once again, before forwarding the message, you have the option of editing the subject line or the message itself. (For example, you may wish to precede the original message with a comment of your own, along the lines of: "Frank: I thought you'd be interested in this joke about Congress.")

All that remains is for you to specify who receives the forwarded message. Just address it as you would any outgoing piece of mail.

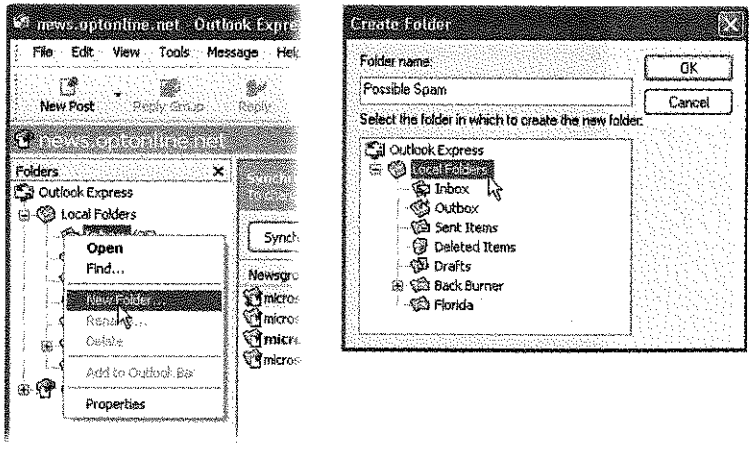


Figure 12-4: *Before you click OK, be sure to click the name of the existing folder that you want to* contain *your new one. Most of the time, you'll probably want to click the Local Folders icon before creating the new folder.*

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Printing Messages

Sometimes there's no substitute for a printout of an email message—an area where Outlook Express shines. Just click the Print button in the toolbar, choose File→Print, or press Ctrl+P. The standard Windows Print dialog box pops up, so that you can specify how many copies you want, what range of pages, and so on. Finally, click the Print button to begin printing.

Filing Messages

Outlook Express lets you create new folders in the Folders list; by dragging messages from your Inbox onto one of these folder icons, you can file away your messages into appropriate storage cubbies. You might create one folder for important messages, another for order confirmations when shopping on the Web, still another for friends and family, and so on. In fact, you can even create folders *inside* these folders, a feature beloved by the hopelessly organized.

To create a new folder, choose File→Folder→New, or right-click the Local Folders icon (in the folder list), and choose New Folder from the shortcut menu (Figure 12-4, left). Either way, a Create Folder window appears, providing a place to name the new folder (Figure 12-4, right).

Tip: To rename an existing folder, right-click it and choose Rename from the shortcut menu.

To move a message into a folder, proceed like this:

- Drag it out of the list pane and onto the folder icon. You can use any part of a message's "row" in the list as a handle. You can also drag messages en masse onto a folder.
- Control-click a message (or one of several that you've highlighted). From the resulting shortcut menu, choose Move to Folder. In a dialog box, the folder list appears; select the one you want, then press Enter or click OK.

Tip: When you click a + button in the Folder list, you see all folders contained within that folder, exactly as in Windows Explorer. You can drag folders inside other folders, nesting them to create a nice hierarchical folder structure. (To drag a nested folder back into the list of "main" folders, just drag it to the Local Folders icon.)

You can also drag messages between folders; just drag one from the message list onto the desired folder at the left side of the screen.

This can be a useful trick when applied to a message in your Outbox. If you decide to postpone sending it, drag it into any other folder; Outlook Express won't send it until you drag it *back* into the Outbox.

Flagging Messages

Sometimes, you'll receive an email message that prompts you to some sort of action, but you may not have the time (or the fortitude) to face the task at the moment. ("Hi

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there... it's me, your accountant. Would you mind rounding up your expenses for 1993 through 2001 and sending me a list by email?")

That's why Outlook Express provides the Flag commands, which let you *flag* a message, positioning a little red flag in the corresponding column next to a message's name. These little red flags are simply visual indicators that you place for your own convenience, meaning whatever you want them to mean. You can bring all flagged messages to the top of the list by choosing View→Sort By→Flag.

To flag a message in this way, select the message (or several messages) and choose Message→Flag Message. (Use the same command again to clear a flag from a message.)

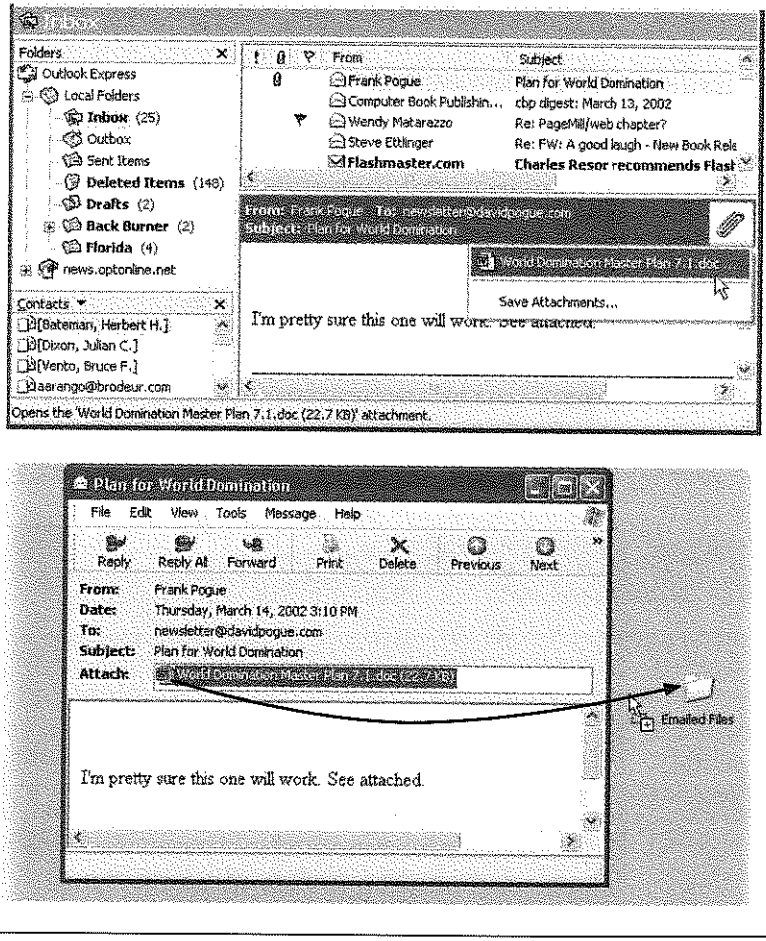


Figure 12-5:
Top: One way to rescue an attachment from an email message is to click the paper clip icon and choose Save Attachments.

Bottom: Dragging an attachment's icon onto your desktop takes the file out of the Outlook Express world and into your standard Windows world, where you can file it, trash it, open it, or manipulate it as you would any file.

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Opening Attachments

Just as you can attach files to a message, people can also send files to you. You know when a message has an attachment because a paper clip icon appears next to its name in the Inbox.

Outlook Express doesn't store downloaded files as normal file icons on your hard drive. All your messages *and* all the attached files are part of one big, specially encoded mail file. To extract an attached file from this mass of software, use one of the following methods:

- Click the attachment icon (Figure 12-5), select Save Attachments from the shortcut menu, and then specify the folder in which you want the file saved.
- Click the attachment icon. A shortcut menu appears, from which you can either choose the name of the attachment to open the file directly (in Word, Excel, or whatever), or Save Attachments to save it to the disk.
- If you've double-clicked the message so that it appears in its own window, then drag the attachment icon out of the message window and onto any visible portion of your desktop, as shown in Figure 12-5.
- Again if you've opened the message into its own window, you can double-click the attachment's icon in the message. Once again, you'll be asked whether you want to open the file or save it to the disk.

Note: Whenever you open an attachment directly from within the email (rather than saving it to the disk first), *use the File→Save As command* to save the file into a folder! Otherwise, you won't be able to open the file again except from within Outlook Express—and any changes you make to that document will appear only when you open it from within Outlook Express, too.

FREQUENTLY ASKED QUESTION

Not Everyone Has the Same Software

People send me documents in Microsoft Word, but I use WordPerfect. I write back and tell them to paste the text into the email message itself, but they don't like to do that. Do I have to buy tons of software I don't want just to open attachments?

No. There's often a way to open attachments even if you don't own the program used to create them. Microsoft Word documents, for instance, automatically open in WordPad if you don't have Microsoft Word on your system.

Word processors and spreadsheet programs can usually *import* documents created by other applications, complete with formatting. To try this approach, open the email message that contains the attachment. Then right-click the icon for the attachment. From the shortcut menu, choose Save As and save the file in a folder (the My Documents folder is a good choice).

Finally, launch your own equivalent application (word processor, spreadsheet program, or whatever), and then choose File→Open or File→Import. Locate the file you moved into your My Documents folder. You'll be pleased at how often this trick opens a document that was created by a program that you don't have...using a program that you do.

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An important reminder: If the Save As shortcut menu is dimmed, or if you see a "This attachment has been blocked" message, it's because Outlook Express is protecting you from an attachment it believes might contain a virus. See page 338 for details and workarounds to this Service Pack 2 feature.

Message Rules

Once you know how to create folders, the next step in managing your email is to set up a series of *message rules*. Message rules are filters that can file, answer, or delete an incoming message *automatically* based on its subject, address, or size. Message rules require you to think like the distant relative of a programmer, but the mental effort can reward you many times over. In fact, message rules can turn Outlook Express into a surprisingly smart and efficient secretary.

Setting up message rules

Now that you're thoroughly intrigued about the magic of message rules, here's how to set one up:

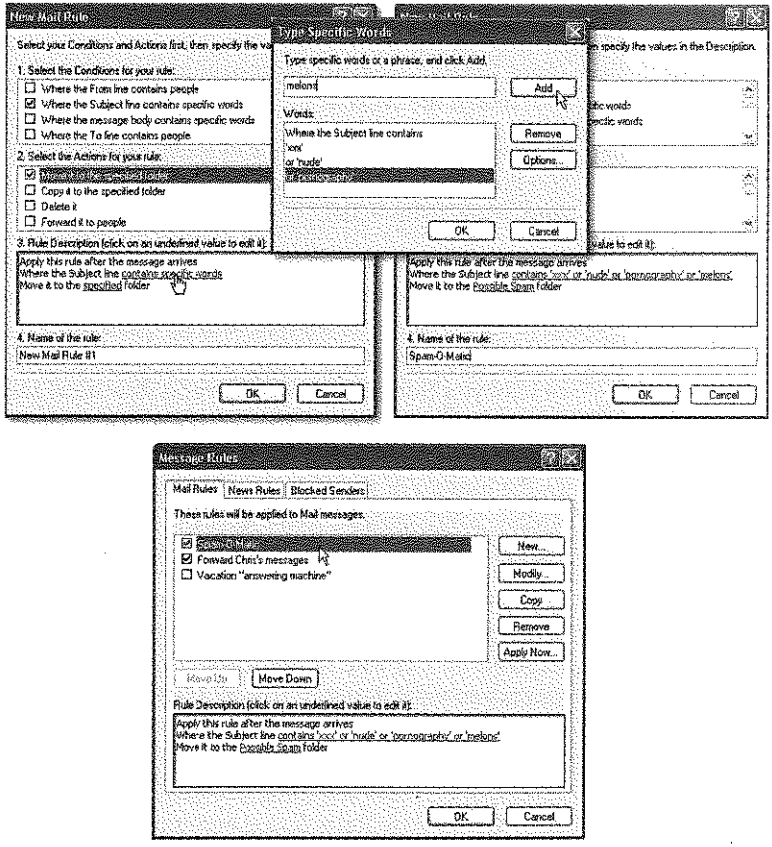


Figure 12-6:
Top left: Building a message rule entails specifying which messages you want Outlook Express to look for--and what to do with them. By clicking the underlined words, as shown here, you specify what criteria you're looking for.

Top middle: Let the rule know which words it's supposed to watch for.

Top right: The completed message rule (note the summary at the bottom).

Bottom: All mail message rules you've created appear in the Message Rules dialog box. Select a rule to see what it does, and use the Move Up and Move Down buttons to specify the order in which rules should be run. Double-click a rule to open the Edit Rule dialog box, where you can specify what the rule does.

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1. Choose Tools→Message Rules→Mail.

   The New Mail Rule dialog box appears, as shown in Figure 12-6 at top left.

2. **Use the top options to specify how Outlook Express should select messages to process.**

   For example, if you'd like Outlook Express to watch out for messages from a particular person, you would choose, "Where the From line contains people."

   To flag messages containing *loan, $$$$, XXXX, !!!!*, and so on, choose, "Where the Subject line contains specific words."

   If you turn on more than one checkbox, you can set up another condition for your message rule. For example, you can set up the first criterion to find messages *from* your uncle, and a second that watches for subject lines that contain "humor." Now, only jokes sent by your uncle will get placed in, say, Deleted Items.

   (If you've set up more than one criterion, you'll see the underlined word and at the bottom of the dialog box. It indicates that the message rule should apply only if *all* of the conditions are true. Click the and to produce a little dialog box, where you have the option to apply the rule if *any* of the conditions are met.)

3. **Using the second set of checkboxes, specify what you want to happen to messages that match the criteria.**

   If, in step 2, you told your rule to watch for junk mail containing *$$$$* in the Subject line, here's where you can tell Outlook Express to delete or move the message into, say, a Spam folder.

   With a little imagination, you'll see how these checkboxes can perform absolutely amazing functions with your incoming email. Outlook Express can delete, move, or print messages; forward or redirect them to somebody; automatically reply to certain messages; and even avoid downloading files bigger than a certain number of kilobytes (ideal for laptop lovers on slow hotel room connections).

4. **Specify *which* words or people you want the message rule to watch out for.**

   In the bottom of the dialog box, you can click any of the underlined phrases to specify which people, which specific words, which file sizes you want Outlook Express to watch out for—a person's name, or *XXX*, in the previous examples.

   If you click contains people, for example, a dialog box appears in which you can access your address book to select certain individuals whose messages you want handled by this rule. If you click contains specific words, you can type in the words you want a certain rule to watch out for (in the Subject line, for example; see Figure 12-6, top). And so on.

5. **In the very bottom text box, name your mail rule. Click OK.**

   Now the Message Rules dialog box appears (Figure 12-6, bottom). Here, you can manage the rules you've created, choose a sequence for them (those at the top get applied first), and apply them to existing messages (by clicking Apply Now).

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Tip: Outlook Express applies rules as they appear—from top to bottom—in the Message Rules window; if a rule doesn't seem to be working properly, it may be that an earlier rule is intercepting and processing the message before the "broken" rule even sees it. To fix this, try moving the rule up or down in the list by selecting it and then clicking the Move Up or Move Down buttons.

Two sneaky message-rule tricks

You can use message rules for many different purposes. But here are two of the best:

- **Create a spam filter.** When a spammer sends junk email, he usually puts your address on the "BCC:" (blind carbon copy) line, to prevent you from seeing who else received the message. This characteristic makes it easy to screen out such mail, and create a message rule that looks for messages where the "To:" or "CC:" line contains *your* address—and files them into the Inbox as usual.

  But then create another message rule for "For all messages" that puts messages into a folder that you've created—called, for example, Possible Spam. Because the second rule doesn't kick in until *after* the first one has done its duty, the second rule affects only messages in which your name appeared on the "BCC:" line (which is almost always spam). Once a week, it's wise to look through the Possible Spam folder in case a legitimate message found its way there.

- **The email answering machine.** If you're going on vacation, turn on "For all messages" in step 2, and then "Reply with message" in step 3. In other words, you can turn Outlook Express into an email answering machine that automatically sends a canned "I'm away until the 15th" message to everyone who writes you.

Tip: Be sure to unsubscribe from, or turn off, any email mailing lists before you turn on "For all messages"; otherwise, you'll incur the wrath of the other Internet citizens by littering their email discussion groups with copies of your auto-reply message.

Configuring Outlook Express

Outlook Express has enough features and configuration options to fill a very thick book. You can see them for yourself by choosing Tools→Options from the Outlook Express window (see Figure 12-7). Here's an overview of some of the features you'll find.

General tab

Most of the controls on the General tab govern what Outlook Express does when you first launch it. Take note of the options for configuring automatic connection to your ISP. You can select the option to check for messages every few minutes, and then use the drop-down list to tell Outlook Express how, and whether, to connect at that time—if you're not already online.

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Read tab

Use these options to establish how the program handles messages in the Inbox. One of these options marks a message as having been read—changing its typeface from bold to non-bold—if you leave it highlighted in the list for five seconds or more, even without opening it. That's one option you may want to consider turning off. (This is also where you choose the font you want to use for the messages you're reading, which is an important consideration.)

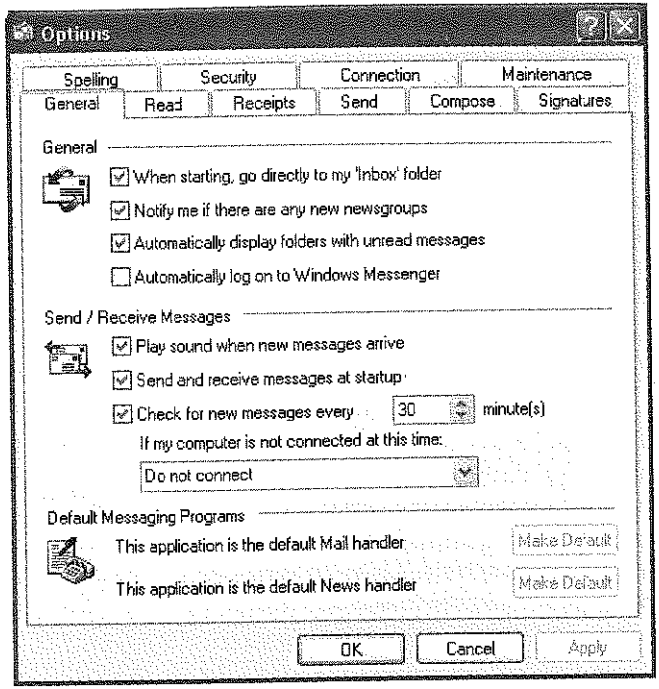


Figure 12-7:
The Options dialog box has ten tabs, each loaded with options. Most tabs have buttons that open additional dialog boxes. Coming in 2007: Outlook Express Options: The Missing Manual.

Receipts tab

You can add a *return receipt* to messages you send. When the recipient reads your message, a notification message (receipt) is emailed back to you under two conditions: *if* the recipient agrees to send a return receipt to you, and *if* the recipient's email program offers a similar feature. (Outlook Express, Outlook, and Eudora all do.)

Send tab

The options on the Send tab govern outgoing messages. One option to consider turning *off* here is the default option, "Send messages immediately." That's because as soon as you click the Send button, Outlook Express tries to send the message, even if that means triggering your modem to dial. All of this dialing—and *waiting* for the dialing—drives some people crazy, especially in households with only one phone line.

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If you turn this option off, then clicking the Send button simply places a newly written message into the Outbox. As you reply to messages and compose new ones, the Outbox collects them. They're not sent until you choose Tools→Send and Receive (or click Send/Recv on the toolbar, or press Ctrl+M). Only at that point does Outlook Express command your modem to dial the Internet. It then sends all the waiting outgoing mail at once.

Tip: To see the messages waiting in your Outbox, click the Outbox icon at the left side of the screen. At this point, you can click a message's name (in the upper-right pane of the screen) to view the message itself in the *lower*-right pane, exactly as with messages in your Inbox.

Don't bother to try *editing* an outgoing message in this way, however, since Outlook Express won't let you do so. Only by double-clicking a message's name (in the upper-right pane), thus opening it into a separate window, can you make changes to a piece of outgoing mail.

The Send tab also includes features for configuring replies. For example, you can disable the function that puts the original message at the bottom of a reply.

Finally, the "Automatically put people I reply to in my Address Book" can be a real timesaver. Each time you reply to somebody, his email address is automatically saved

FREQUENTLY ASKED QUESTION

Canning Spam

Help! I'm awash in junk email! How do I get out of this mess?

Spam is a much hated form of advertising that involves sending unsolicited emails to thousands of people. While there's no instant cure for spam, you can take certain steps to protect yourself from it.

1. Use one email account for online shopping, Web site and software registration, and newsgroup posting; use a second one for person-to-person email.

   Spammers have automated software robots that scour every public Internet message and Web page, automatically locating and recording email addresses they find. These are the primary sources of spam, so at least you're now restricting the junk mail to one secondary mail account.

2. Whenever you receive a piece of junk mail, choose Message→Block Sender from the Outlook Express toolbar. Outlook Express will no longer accept email from that sender.

3. When filling out forms or registering products online, always look for checkboxes requesting permission for the company to send you email or share your email address with its "partners." Just say no.

4. When posting messages in a newsgroup, insert the letters NOSPAM somewhere into the email address you've specified in the News Account dialog box (page 402). Anyone replying to you via email must manually remove the NOSPAM from your email address, which is a slight hassle; meanwhile, the spammers' software robots (which aren't very bright) will lift a bogus email address from newsgroup posts.

5. Create *message rules* to filter out messages containing typical advertising words such as *casino, Rolex, herbal,* and so forth. (You'll find instructions in this chapter.)

6. Buy an anti-spam program like SpamAssassin or IHateSpam.

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in your address book, so that the next time you want to write him a note, you won't need to look up the address—just type the first few letters of it in the "To:" box.

Compose tab

Here's where you specify the font you want to use when writing messages and newsgroup messages.

This is also the control center for stationery; it houses custom-designed templates, complete with fonts, colors, backgrounds, borders, and other formatting elements that you can use for all outgoing email. Needless to say, sending a message formatted with stationery means that you're using HTML formatting, as described earlier, complete with its potential downsides.

To choose a stationery style for all outgoing messages, turn on the Mail checkbox and then click the Select button. You're offered a folder full of Microsoft stationery templates; click one to see its preview. You can also click the Create New button on the toolbar, which launches a wizard that walks you through the process of designing your own background design.

Tip: You don't have to use one particular stationery style for all outgoing messages. When sending a message, instead of clicking the Create Mail button on the Outlook Express toolbar, just click the tiny down-arrow triangle *next* to it. Doing so opens a window that lists several stationery styles, letting you choose one on a message-by-message basis.

Signatures tab

As noted earlier in this chapter, you use this tab to design a *signature* for your messages. By clicking the New button and entering more signature material in the text box, you can create several *different* signatures: one that's for business messages, one for your buddies, and so on. (Outlook Express calls them Signature #1, Signature #2, and so on. To rename a signature, click its name and then click the Rename button.)

To insert a signature into an outgoing message, choose Insert→Signature, then choose the one you want from the list that appears.

Spelling tab

The Spelling tab offers configuration options for the Outlook Express spell-checking feature (which requires that you have Microsoft Word). You can even force the spell checker to correct errors in the *original* message when you send a reply (although your correspondent may not appreciate it).

Security tab

This tab contains options for sending secure mail, using digital IDs, and encryption. If you're using Outlook Express in a business that requires secure email, the system administrator will provide instructions. Otherwise, you'll find that most of these settings have no effect.

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Tip: One of these options is very useful in the modern age: "Warn me when other applications try to send mail as me." That's a thinly veiled reference to virus programs that, behind the scenes, send out hundreds of infected emails to everybody in your address book. This option ensures that if some software—not you—tries to send messages, you'll know about it.

Connection tab

You change options for making and sustaining the connection to your ISP in the Connection tab. For example, you can tell Outlook Express to hang up automatically after sending and receiving messages (and reconnect the next time you want to perform the same tasks). As noted in the dialog box, though, Outlook Express otherwise uses the same Internet settings described in Chapter 9.

Maintenance tab

This tab is your housekeeping center. These options let you clear out old deleted messages, clean up downloads, and so on.

Newsgroups

Newsgroups have nothing to do with news; in fact, they're Internet bulletin boards. There are at least 50,000 of them, on every conceivable topic: pop culture, computers, politics, and every other special (and *very* special) interest; in fact, there are several dozen just about Windows. Use Outlook Express to read and reply to these messages almost exactly as though they were email messages.

Furthermore, Outlook Express lets you use multiple *news servers* (bulletin-board distribution computers), subscribe to individual newsgroups, filter messages in your newsgroups using rules, and post and read messages complete with attachments.

Note: If a news server (not an individual newsgroup) is selected in the Folders list, then the rightmost portion of the Outlook Express interface displays a list of newsgroups available on that server.

UP TO SPEED

Newsgroups Explained

Newsgroups (often called *Usenet*) started out as a way for people to conduct discussions via a bulletin-board-like system, in which a message is posted for all to see and reply to. These public discussions are divided into categories called newsgroups, which cover the gamut from miscellaneous photographic techniques to naval aviation.

These days, Usenet has a certain seedy reputation as a place to exchange questionable pictures, pirated software, and MP3 files with doubtful copyright pedigrees. Even so, there are tens of thousands of interesting, informative discussions going on, and newsgroups are great places to get help with troubleshooting, exchange recipes, or just to see what's on the minds of your fellow Usenet users.

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Setting Up an Account

Setting up a new news account is similar to setting up a new email account; the adventure begins by contacting your Internet service provider and finding out its *news server address*, along with your user name and password.

Next, choose Tools→Accounts; click the News tab, click the Add button, and then click News.

Now a wizard steps you through the process of creating a news account in Outlook Express; it involves entering your email address and the address of your news server. (Sometimes you get newsgroup access with your regular Internet account. If your ISP doesn't provide newsgroup access, you'll have to subscribe to a news service. The price depends on how much you download each month; visit *www.easynews.com*, *www.supernews.com*, or *www.newsguy.com* for more information.)

Download the List of Newsgroups

When you're finished with the wizard, Outlook Express invites you to download a list of newsgroups available on your server. Click the Yes button, and then wait patiently for a few minutes.

Outlook Express goes to work downloading the list, which can be quite long—more than 50,000 entries, in many cases—and takes several minutes if you connect to the Internet with a dial-up modem. Once that's done, though, you won't have to do it again.

You wind up with the dialog box shown in Figure 12-8. (You can always get to this master list of newsgroups by choosing Tools→Newsgroups, or by pressing Ctrl+W.)

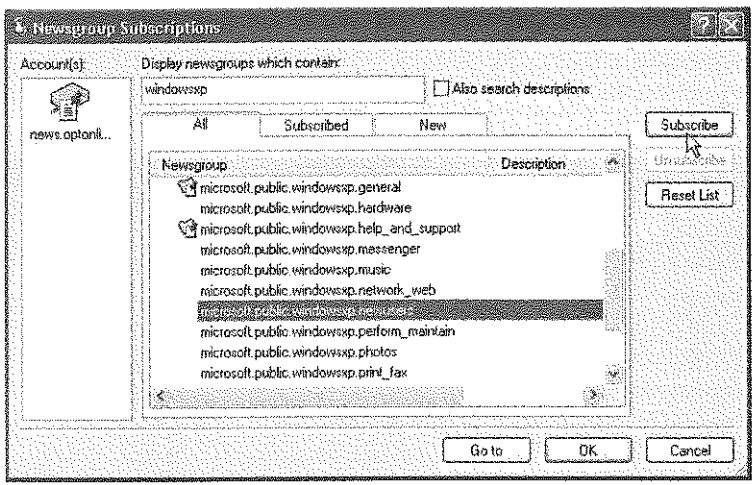


Figure 12-8: *In the text box at the top, enter the text you want to look for in the newsgroup's title (such as* windowsxp, *as shown here—in cyberspace, there are no spaces between words). If you turn up an appealing-sounding topic in the gigantic list beneath, click its name and click the Subscribe button to* subscribe *to it. Now Outlook Express will download the latest messages on that topic each time you connect.*

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Finding Newsgroups and Messages

If you're looking for a particular topic, such as Windows XP, you can view a list of matching discussions by typing a phrase into the text box that's labeled, however ungrammatically, "Display newsgroups which contain" at the top of the window. Outlook Express hides any newsgroups that *don't* match that text (see Figure 12-8).

Reading Messages

Once Outlook Express has downloaded a list of available newsgroups, it's up to you to sift through them and select the discussions you want to monitor.

Fortunately, Outlook Express makes it easy to follow the raging Internet discussions with a feature called *subscriptions*. To subscribe to a newsgroup, select its name in the list, and then click the Subscribe button. When you click OK, an icon for that discussion topic appears under the server's name in the Folder list, acting as though it's a nested folder.

The next time you connect to the Internet, Outlook Express downloads all of the message summaries in the discussions to which you've subscribed. (There may be just a few messages, or several hundred; they may go back only a few days or a couple of weeks, depending on the amount of "traffic" in each discussion and the amount of storage space available on the news server.) These are not the messages themselves, just the *headers*—the author's name, the subject, and the date the message was sent.

To read the actual messages in a newsgroup, either click an entry in the list of messages to download the contents of the message and display it in the preview window (Figure 12-9), or double-click an entry to open the list of messages in a new window.

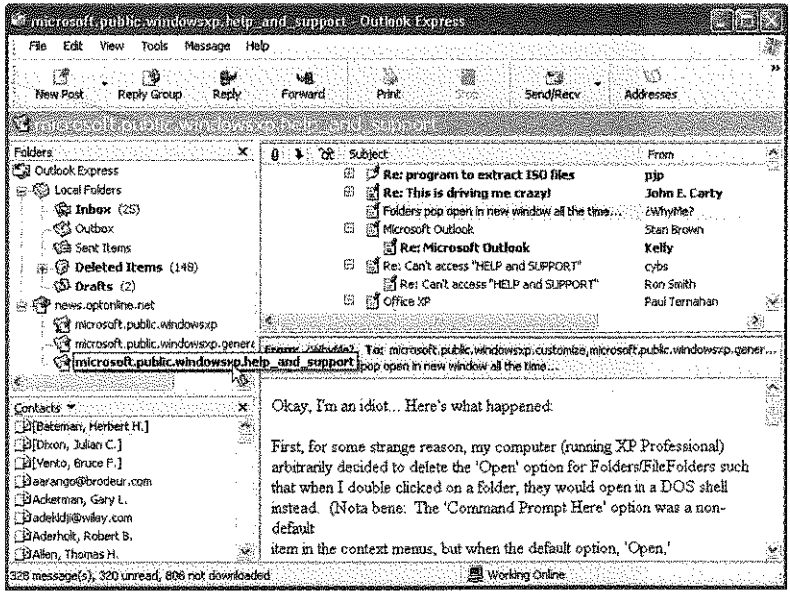


Figure 12-9: *If you've been using Outlook Express for email, the newsgroup portion of things should look familiar. It uses the same three-pane view: The Folders pane lists news servers to which you've subscribed, the top-right pane lists the names of messages in a selected newsgroup, and the bottom-right pane displays the actual text of the message you've highlighted in the message list. (If a newsgroup name is too long to see in its little panel, point to it without clicking, as shown here.)*

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Some particularly large attachments in newsgroups are automatically divided into multiple segments, in part to accommodate those with slow Internet connections. If you're having trouble saving a multipart attachment to your hard drive, make sure that you've selected the message that contains the *first* part. (Even then, you may find that joining multipart newsgroup messages isn't one of Outlook Express's strongest features.)

Tip: You can set up message rules to screen out messages from certain people, messages with certain phrases in their Subject lines, and so on. It works exactly like the message rules for email, as described earlier in this chapter.

Replying, Composing, and Forwarding Messages

Working with newsgroup messages is very similar to working with email messages, except that you must be conscious of whether you're replying to the individual sender of a message or to the entire group. Otherwise, you can reply to messages, forward them, or compose them exactly as described earlier in this chapter. As with email, you can use plain text or (if you don't mind annoying the other Internet citizens) HTML formatting, and include file attachments, too (use the Attach toolbar button, for example).

Tip: Aside from posting advertisements and HTML-formatted messages, the best way to irritate everyone on a newsgroup is to ask a question that has already been answered recently on the newsgroup. Before asking a question, spend five minutes reading the recent newsgroup messages to see whether someone has already answered your question. Also consider visiting the Groups tab at *www.google.com*, a Web site that lets you search all newsgroups for particular topics.

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4

Part Four: Plugging into Windows XP

Chapter 13: Printing, Fonts, and Faxing

Chapter 14: Hardware

Chapter 15: Joining, Compressing, and Encrypting Disks

Chapter 16: Maintenance, Backups, and Troubleshooting

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CHAPTER
13

Printing, Fonts, and Faxing

Technologists got pretty excited about "the paperless office" in the eighties, but the PC explosion had exactly the opposite effect: Thanks to the prolifera-tion of inexpensive, high-quality PC printers, we generate far more printouts than ever. There's not much to printing from Windows XP, so this is a short chapter.

Installing a Printer

A printer is designed to follow computer instructions called *printer codes* from your PC. These codes tell the printer what fonts to use, how to set margins, which paper tray to use, and so on.

But the codes aren't identical for every printer. Therefore, every printer requires a piece of software—the printer driver—that tells the printer how to interpret what it "hears" from your computer.

Windows XP comes with hundreds of printer drivers built right in; your printer also came with a set of drivers on a CD or floppy. You can often find more recent driver software for your printer on the manufacturer's Web site, such as *www.epson.com* or *www.lexmark.com,* or from a central driver repository like *www.windrivers.com.*

Existing Printers

Did you upgrade your PC to Windows XP from an earlier version—one that worked fine with your printer? In that case, Windows XP automatically notices and inherits your existing settings. If it's a fairly recent printer with a fairly recent driver, it'll probably work fine with Windows XP.

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But if the printer is especially elderly, the printer software may be incompatible with Windows XP. In that case, your first activity after dinner should be to search the printer company's Web site for an updated version, or check Microsoft's master Windows XP compatibility list at *www.microsoft.com/hcl*.

If you just bought a new computer or a new printer, however, you'll have to hook it up yourself and install its software. In general, there's not much to it.

Note: Only people with Administrator accounts can install a new printer to a Windows XP machine (see Chapter 16).

USB Printers

If you're like most people at home these days, you use an inkjet printer that connects to your PC's USB (Universal Serial Bus) port. As a technology, USB has lots of advantages: USB gadgets are easy to connect and disconnect, are very fast, conserve space, can be plugged and unplugged while the PC is running, and so on.

Just the act of connecting a USB printer to your PC, for example, inspires Windows XP to dig into its own bag of included driver modules to install the correct one (Figure 13-1). See Chapter 14 for more on this process.

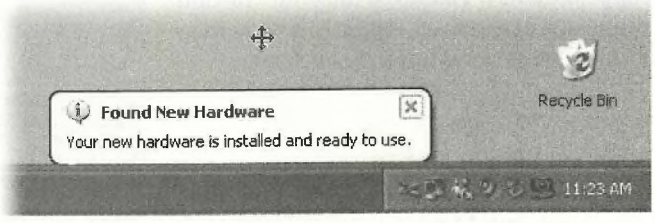


Figure 13-1:
You got lucky. Windows recognizes your printer, has the appropriate driver, and has put the software into place. Let the printing begin.

Network Printers

If you work in an office where numerous people on the network share a single laser printer, the printer usually isn't connected directly to your computer. Instead, it's elsewhere on the network; the Ethernet cable coming out of your PC connects you to it indirectly.

In general, there's very little involved in ensuring that your PC "sees" this printer. Its icon simply shows up in the Start→Control Panel→Printers and Faxes folder. (If you don't see it, run the Add Printer Wizard described in the following section. On its second screen, you'll be offered the chance to look for "A network printer, or printer attached to another computer." That's the one you want.)

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Parallel, Serial, and Infrared Printers

Although USB printers are the world's most popular type today, there was, believe it or not, a time before USB. In those days, most home printers fell into one of these categories:

- **Parallel.** Before USB changed the world, most printers connected to PCs using a printer cable or *parallel cable*. The cable connects to your PC's parallel port, which Microsoft's help screens call the LPT1 port—a 25-pin, D-shaped jack. (On many PCs, this connector is marked with a printer icon on the back panel.)
- **Serial.** Other older printers use a cable connected to one of your computer's *serial* (or *COM*) ports, the connectors that often accommodate an external modem. The primary advantage of a serial connection is the extended cable length: Parallel cables must be no more than nine feet long, while serial cables up to 50 feet long work fine.

Tip: To protect its innards, turn off the PC before connecting or disconnecting a parallel or serial cable.



Figure 13-2: *Top: As the note explains, use the Add Printer Wizard only if your printer doesn't connect to your USB or FireWire (IEEE 1394) port.*

Bottom: In this window, try the "Automatically detect and install my Plug and Play printer" option first, as shown here. If Windows can't automatically detect the brand and model of the printer you've attached, return to this screen and turn off this option. You'll wind up in the dialog box shown in the next illustration.

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- **Infrared.** Certain printers from HP, Canon, Citizen, and other companies print using *infrared* technology—that is, there's no cable at all. Instead, if your PC has an infrared lens (as many laptops do), it can communicate with the printer's similar lens wirelessly, as long as the printer and PC are within sight of, and relatively close to, each other.

If the technology gods are smiling, you can just connect the printer, turn on your Windows XP machine, and delight in the "Found new hardware" message that appears on your taskbar. You're ready to print.

But if Windows doesn't "know about" the printer model you've hooked up, it can't install its drivers automatically. In that case, the Add Printer Wizard appears (Figure 13-2)—or you can always open it. (Choose Start→Control Panel→Printers and Faxes; click the Add Printer link.) Click Next to walk through the questions until you've correctly identified your printer and installed the appropriate software.

Here are the guidelines for using the next screen:

- Try the "Automatically detect and install my Plug and Play printer" checkbox first (see Figure 13-2 at bottom). If it doesn't succeed in locating your printer and installing the software, run the wizard again, this time turning that option off.
- If the "Automatically detect" option didn't work, you'll be asked to specify which PC port your printer's connected to. You'll then be asked to indicate, from a gigantic scrolling list of every printer Microsoft has ever heard of, your exact brand and model (Figure 13-3).

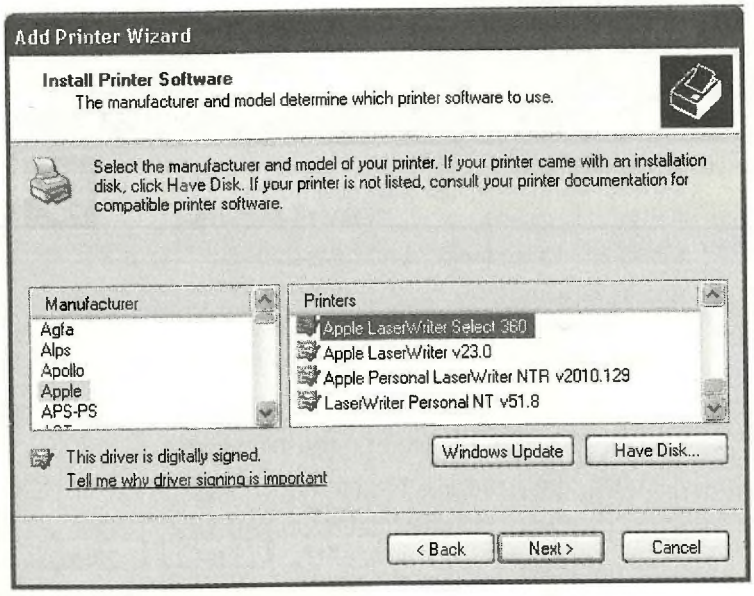


Figure 13-3: *The left pane lists every printer manufacturer Microsoft has ever heard of. Once you've selected your printer's manufacturer, a list of all the printer models from that manufacturer (that Windows XP knows about) appears in the right pane. Click the Have Disk button if your printer's driver software is on a disk supplied by the manufacturer.*

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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 57), just choose Start→Control Panel→Printers and Faxes.
- If you view your Control Panel in *Classic* view (page 249), 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.

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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.

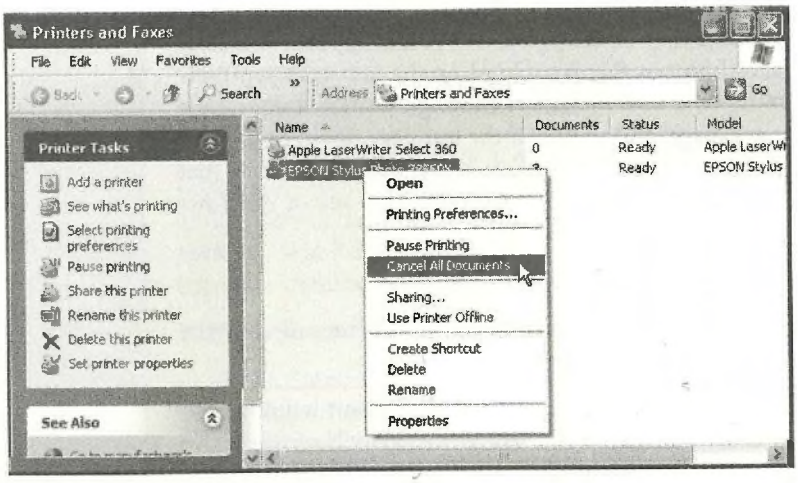


Figure 13-4: *At first, the task pane in the Printers and Faxes window offers only two commands. But when you click a printer icon, a long list of useful options appears, as shown here. Many of them duplicate the options that appear when you right-click a printer icon—something you'd be wise to remember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

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Tip: If you're using your Start menu in Classic view (page 249), 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.

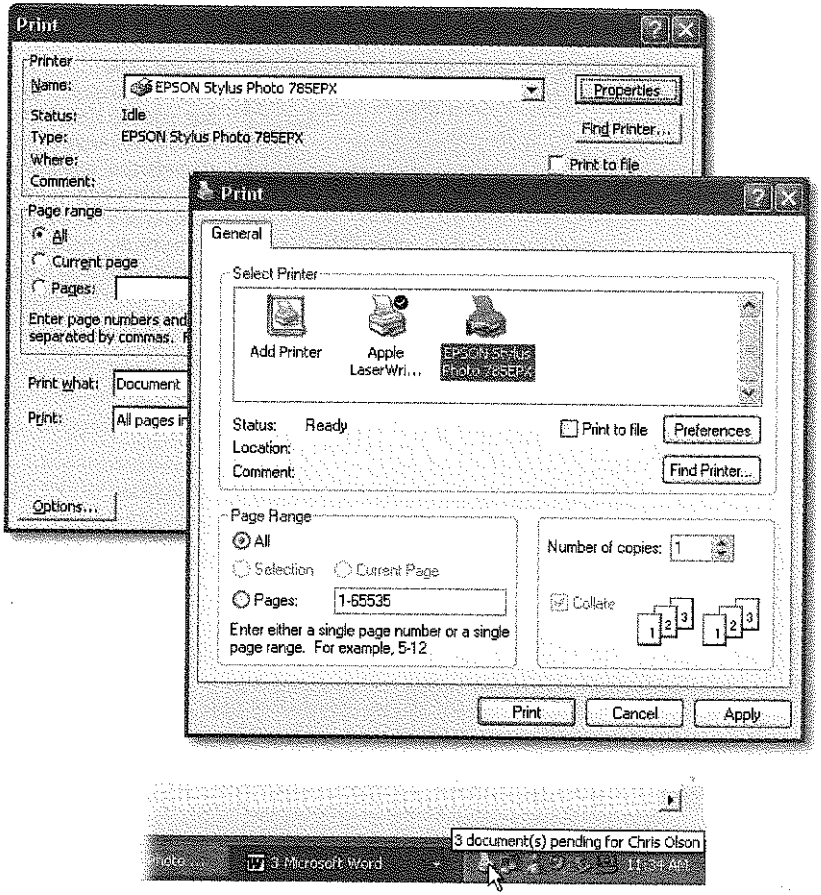


Figure 13-5: *Top: The options in the Print dialog box are different on each printer model and each application, so your Print dialog box may look slightly different.*

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.

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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.

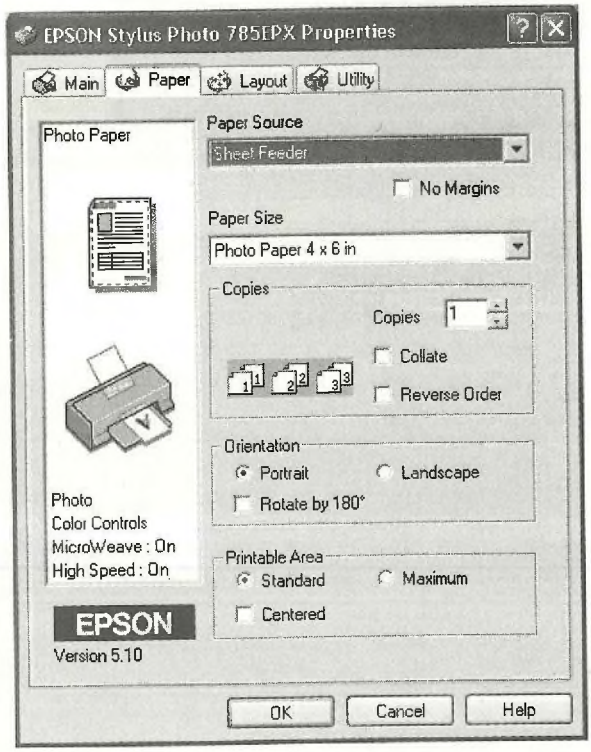


Figure 13-6:
When you choose Properties from the Print dialog box, you can specify the paper size you're using, whether you want to print sideways on the page ("Landscape" orientation), what kind of photo paper you're using, and so on. Here, you're making changes only for a particular printout; you're 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).

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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.

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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.

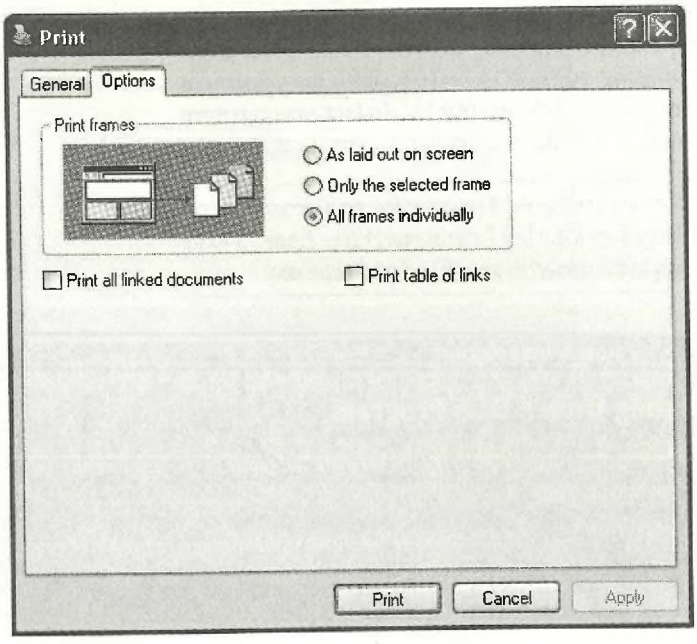


Figure 13-7:
The Web page about to be printed uses frames *(individual, independent, rectangular sections). The Print dialog box in Internet Explorer recognizes frames, and lets you specify exactly which frame or frames you want to print. If the page contains links to* other *Web pages (and these days, 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).*

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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.

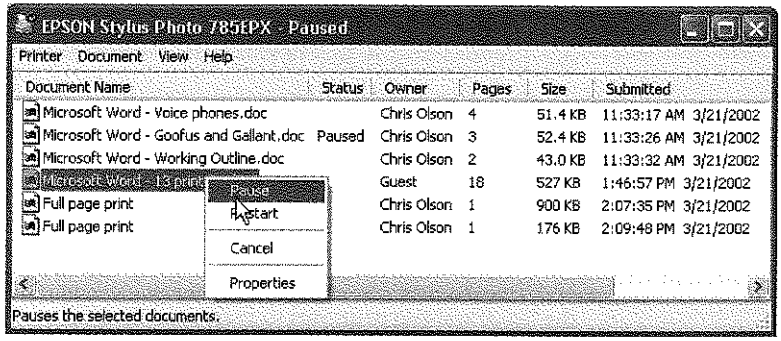


Figure 13-8: *The first document, called "Microsoft Word–Voice phones.doc," has begun printing; the second one, you've put on hold. Several other documents are waiting. By right-clicking documents in this list, you can pause or cancel any document in the queue—or all of them at once.*

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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).

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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 18, 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:

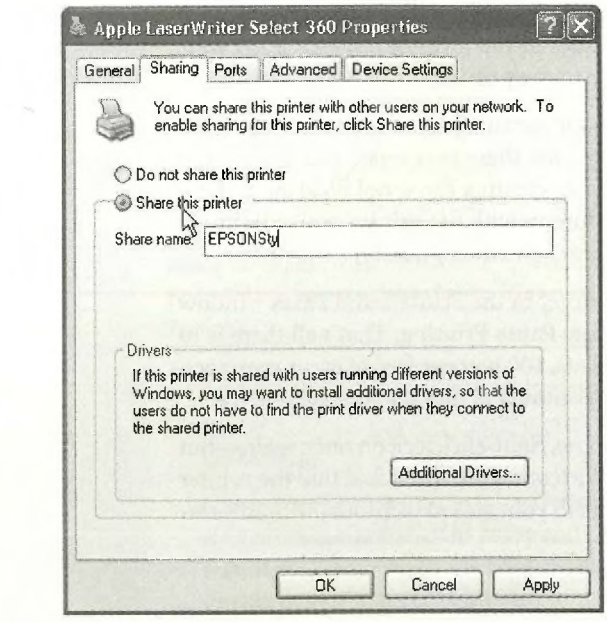
1. **In the Printers and Faxes window, click "Add a printer" in the task pane at the left side.**

   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.**

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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 582). 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.)



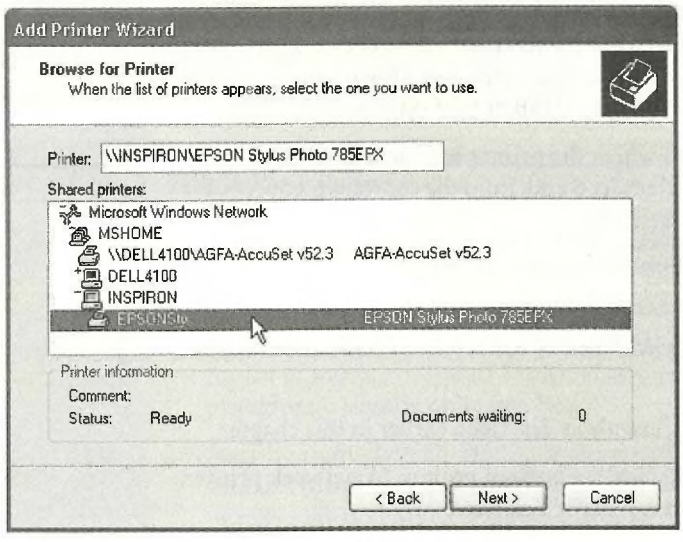


Figure 13-9:
Top: Turn on "Share this printer," and then give the printer a name in the Share name text box. (No spaces or punctuation allowed—and keep it short.) Click OK. The printer is now available on your network.

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.)

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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.

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- 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.

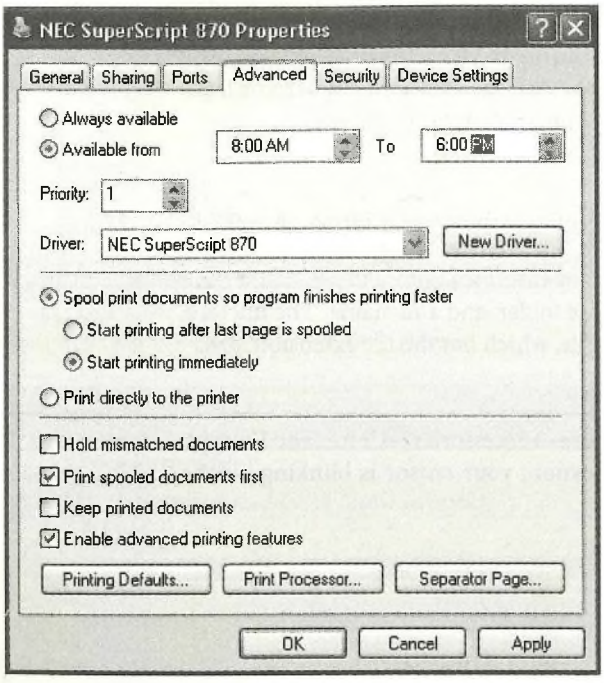


Figure 13-10:
Right-click your printer's icon in the Printers and Faxes window. From the shortcut menu, choose Properties, then click the Advanced tab, shown here. Select "Available from," and use the time setting controls to specify when your underlings are allowed to use this printer from across the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

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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.

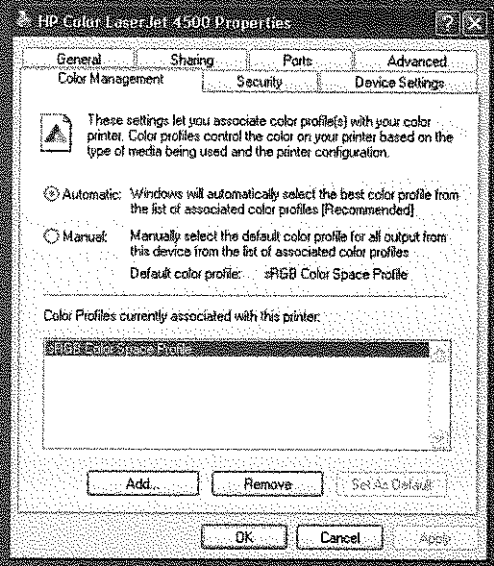
POWER USERS' CLINIC

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.

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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.)

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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."

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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.

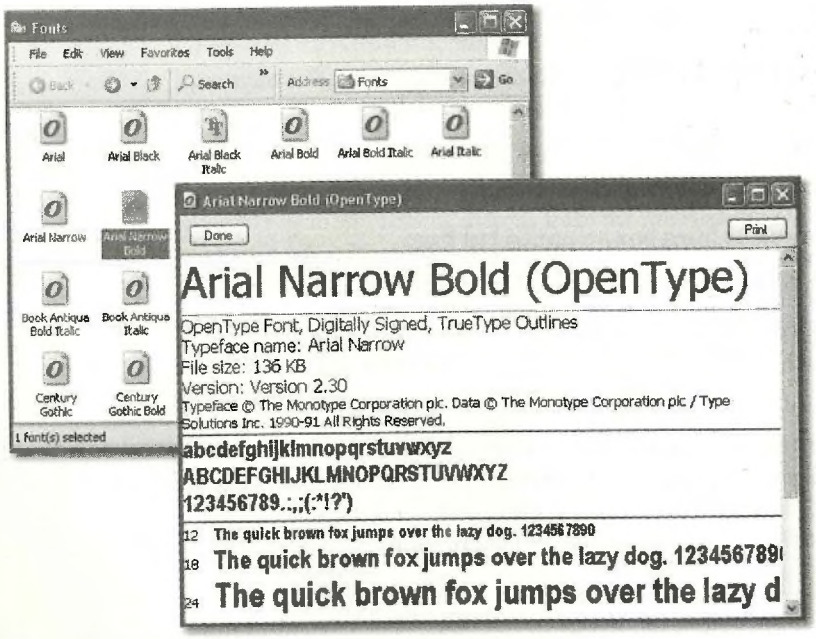


Figure 13-11: *All of your fonts sit in the Fonts folder (top); you'll frequently find an independent font file for each style of a font: bold, italic, bold italic, and so on. You can tell a TrueType font by its TT icon, or an OpenType font by its O icon. Those marked by an A may be PostScript fonts, 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).*

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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 84), 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 411), 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 Professional CD.

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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").

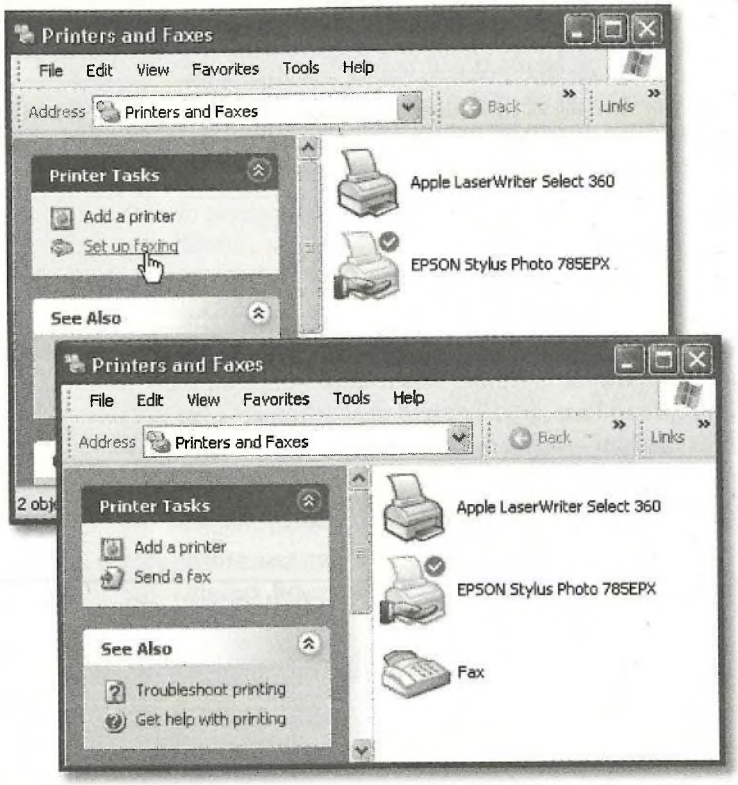


Figure 13-12:
Top: In the Printers and Faxes window, click the "Set up faxing" link on the task pane at the left side of the window. Insert the Windows XP Professional CD when the wizard asks you to do so.

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

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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 432.
- **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.

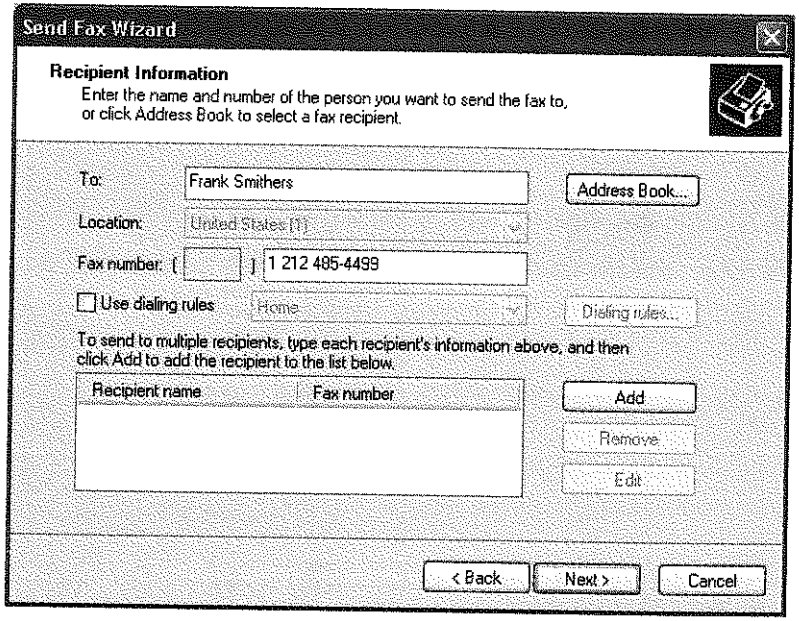


Figure 13-13: *If "Use dialing rules" is turned off, then just type the entire fax number, complete with the area code, the number 1 for long distance, and so on, into the second "Fax number" box. Commas, parentheses, and dashes are irrelevant. But if you turn on "Use dialing rules," you can choose one 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 318.*

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- **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.

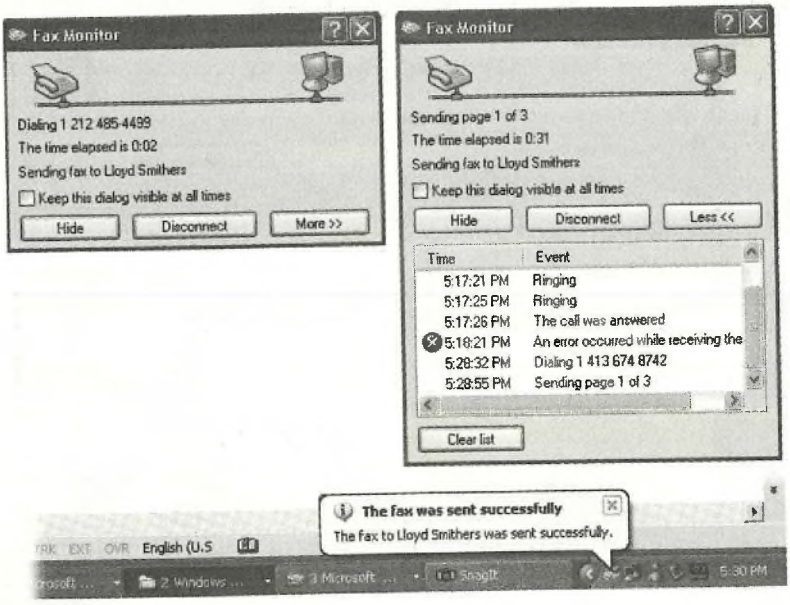


Figure 13-14: *Top left: The Fax Monitor keeps you posted during faxing. If you click More>>, you can see a log of all your fax activities (top right). The more you use the fax software, the less you may feel that you need this little window in your face—eventually, you may prefer to continue working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

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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.

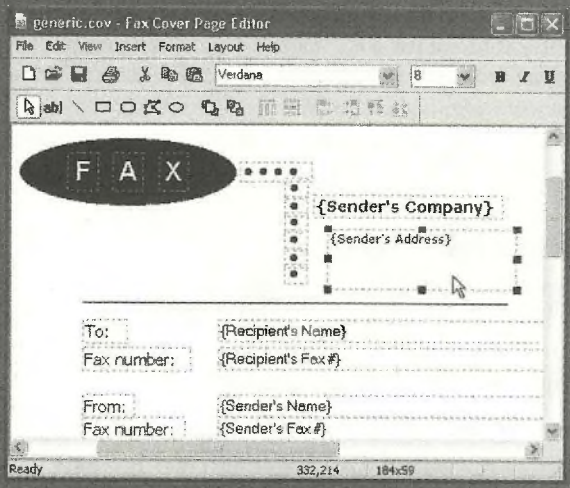
When you click Next again, Windows asks *when* you want the fax sent. Most of the time, of course, you'll just accept the proposed choice—Now—and click Next. But if you work in an office where the fax line is busy all the time, you can schedule your fax to go out at a specified time ("Specific time in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

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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).

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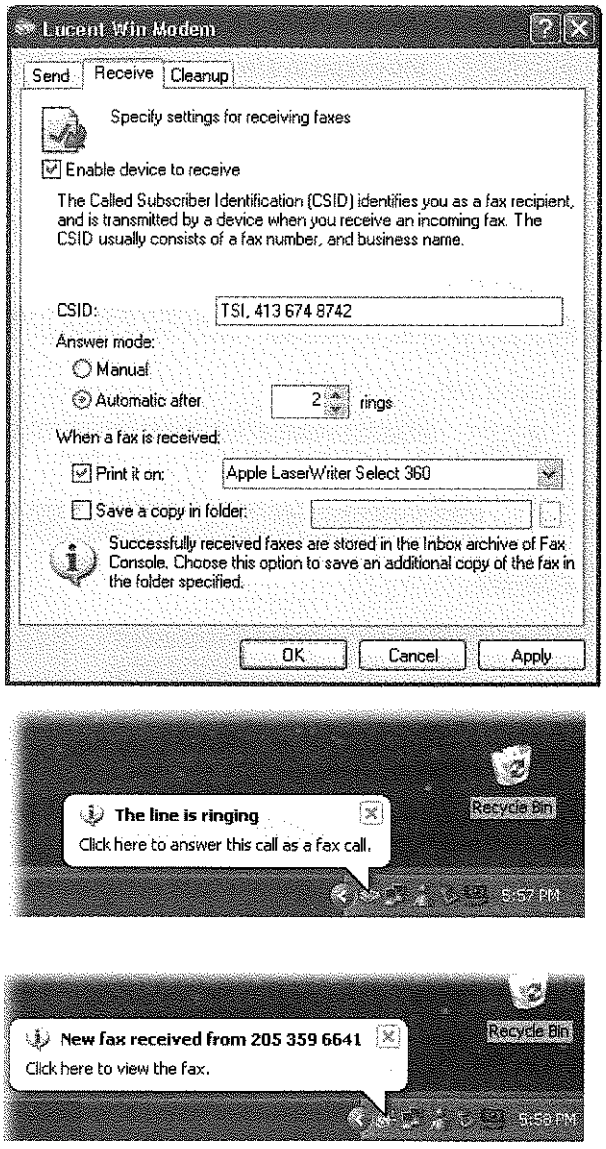
When you do so, the Fax monitor program appears and downloads the fax. To see it, open your Fax Console program, described on page 434.

- **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.



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- **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.

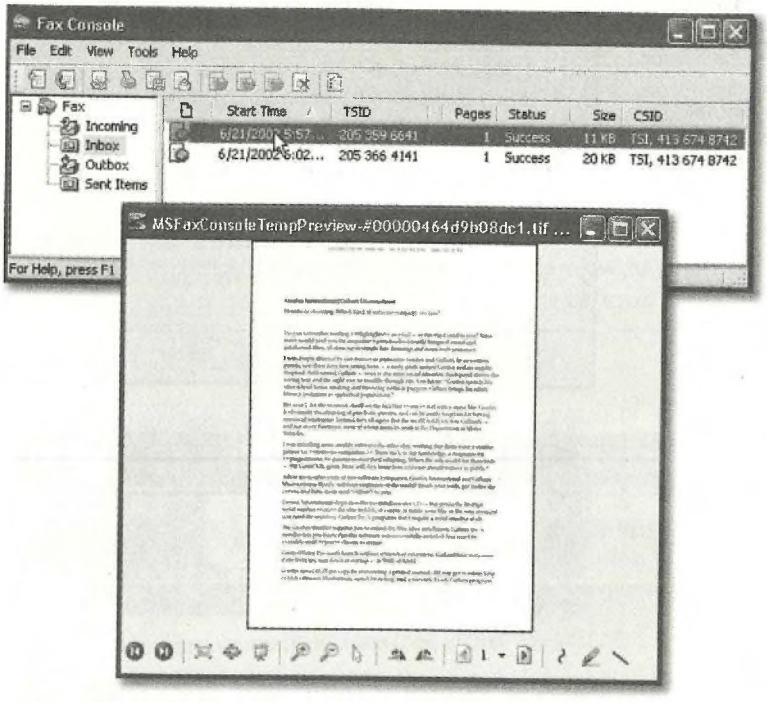


Figure 13-16:
Top: Until you delete them in Fax Console (by selecting them and then pressing the Delete key), your sent and received faxes stay here forever. Some of the toolbar buttons are useful, including Save (turns the fax into a graphics file on your hard drive) and Mail (sends the fax via email).

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.

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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.)

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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.

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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.

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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."

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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.

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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 331, should download the necessary software automatically, or you can just install it using the installation disk that comes with your USB 2.0 appliances.)

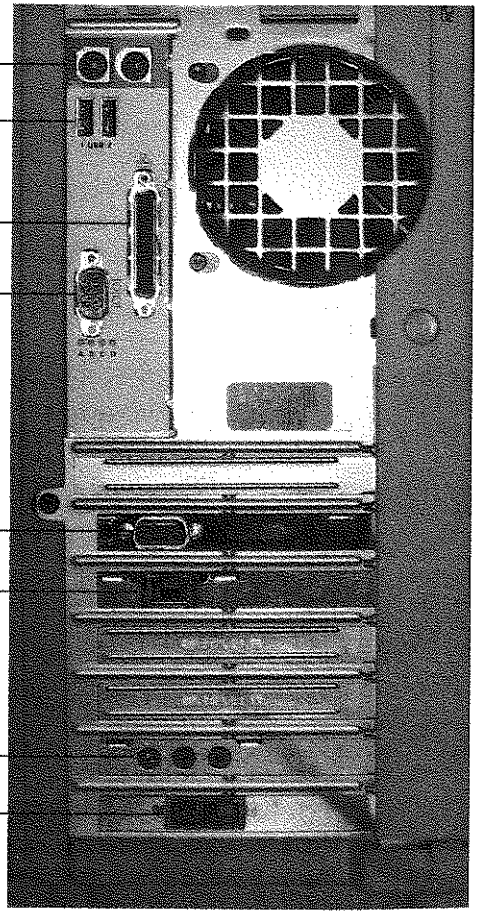


Figure 14-1: *The back panel of the typical PC. Not every computer has every kind of jack, and the standard assortment is evolving over time. But these days, you can generally count on a basic collection like the one shown here.*

- **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.

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The original version of Windows XP Pro 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.

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- **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.)

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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 331.

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 449.

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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.

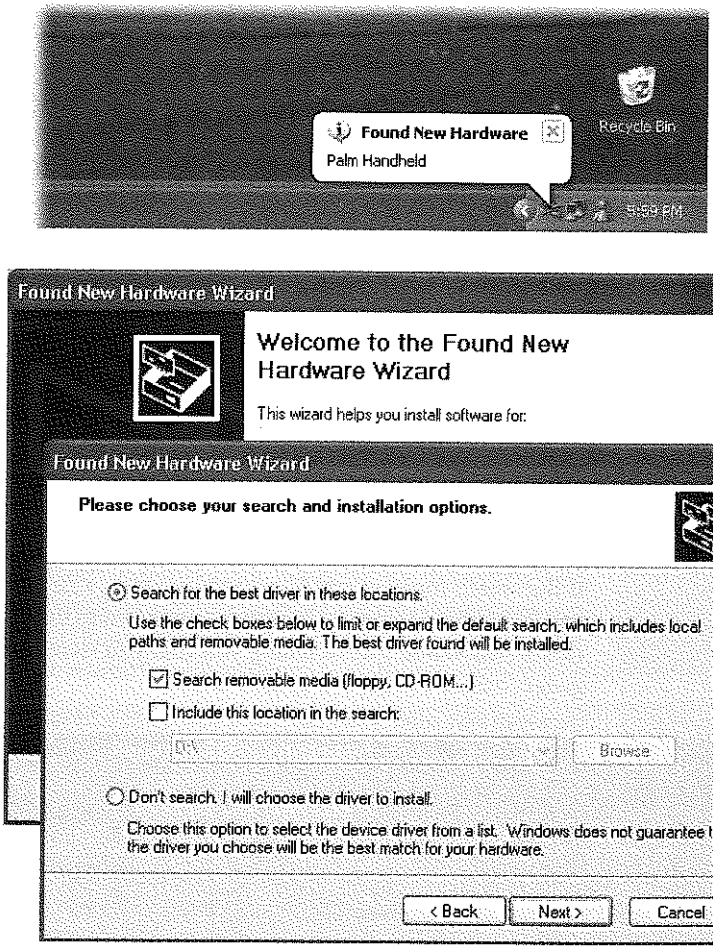


Figure 14-2:
Top: You're halfway home. Windows XP has at least acknowledged that you've plugged something in. Click the balloon to proceed with the software installation (if you didn't install the software first, as you should have).

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.

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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.

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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.

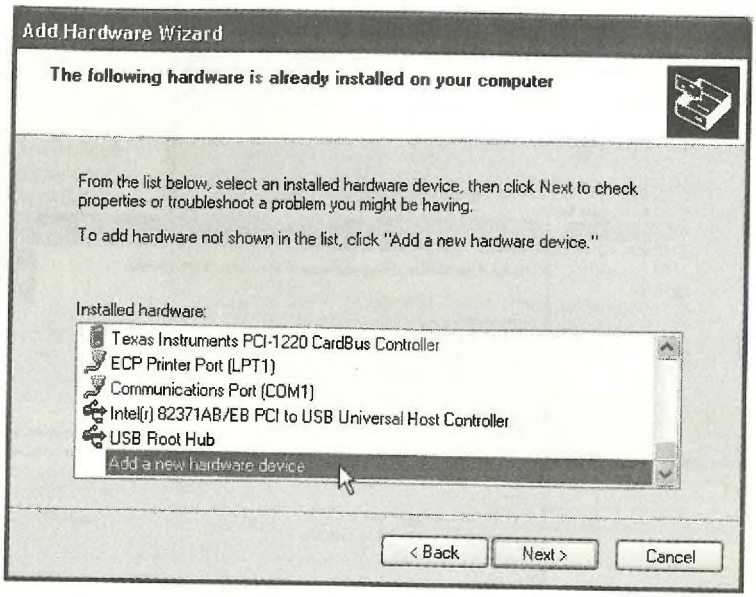


Figure 14-3: *Why does the wizard display a list of components you've already successfully installed? Because you can also use the Add Hardware Wizard to troubleshoot PC components you've already installed, using this very screen. Furthermore, Windows may have detected, but not precisely identified, 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

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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 Professional installation CD.) As a final step, you may be asked to restart the PC.

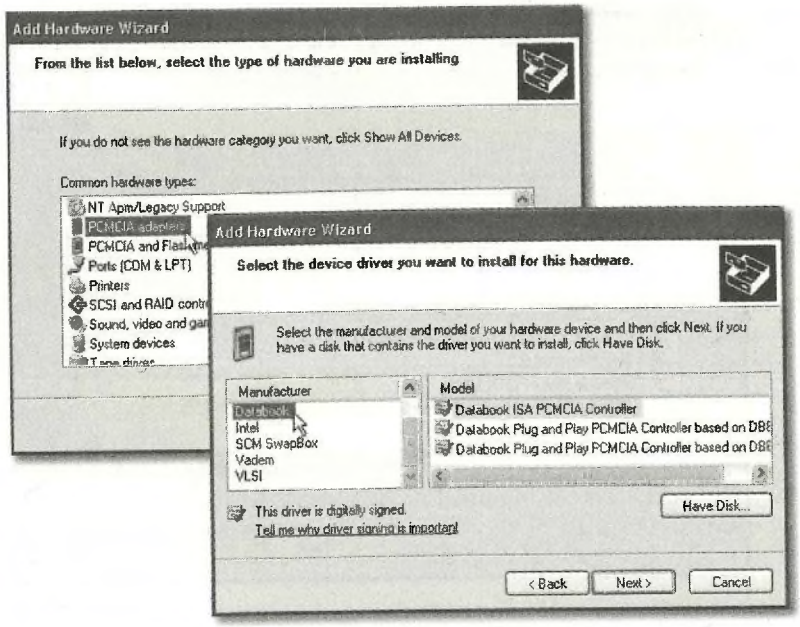


Figure 14-4: *Top left: Specify which kind of component you're adding.*

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 475. Windows XP automatically takes a snapshot of your working system just before you install any unsigned driver.)

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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 296.

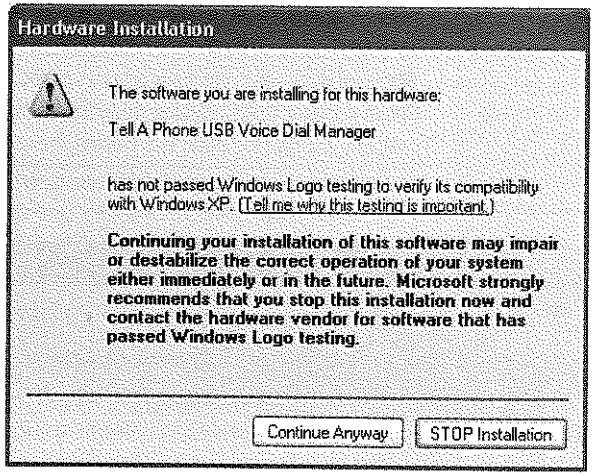


Figure 14-5:
The most stable and smoothly operating PC is one whose components use nothing but digitally signed drivers. On the other hand, just because a driver isn't signed doesn't mean it's no good; it may be that the manufacturer simply didn't pony up the testing fee required by Microsoft's Windows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

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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.

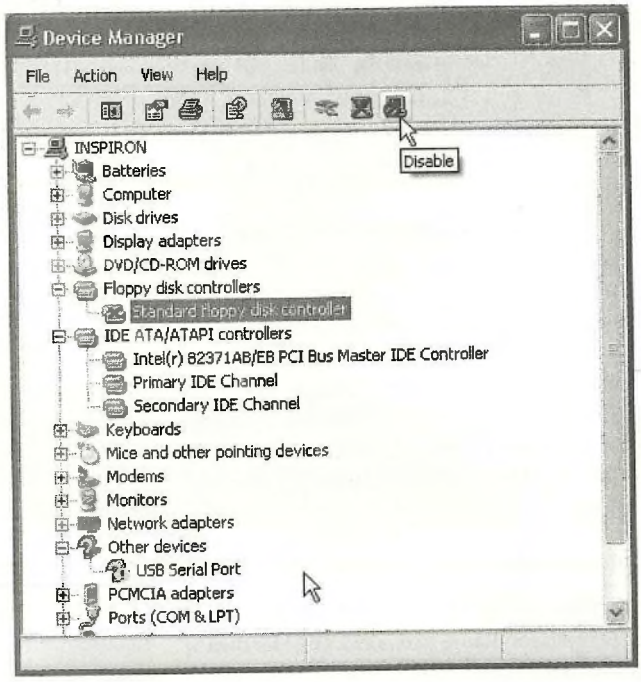


Figure 14-6:
The Device Manager lists types of equipment; to see the actual model(s) in each category, you must expand each sublist by clicking the + symbol. A device that's having problems is easy to spot, thanks to the red X's and yellow exclamation points.

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.

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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.

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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 453), 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.

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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 449), 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.

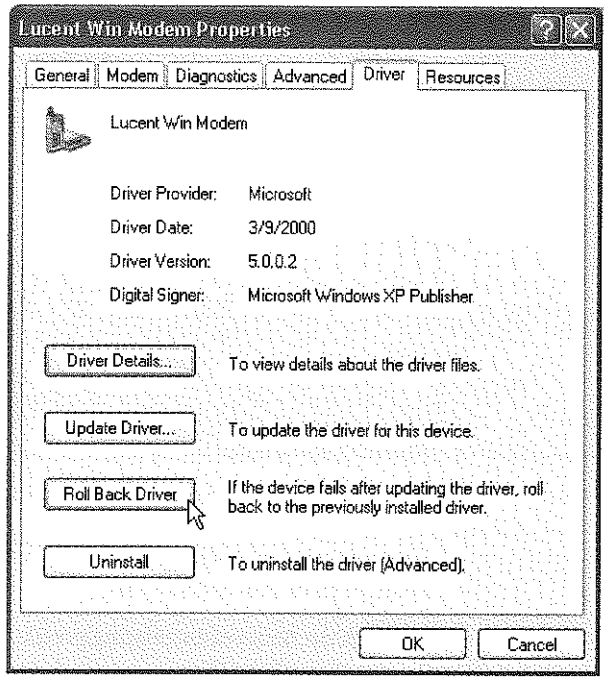


Figure 14-8:
When you double-click a component listed in your Device Manager and then click the Driver tab, you find four buttons and a lot of information. The Driver Provider information, for example, lets you know who is responsible for your current driver—Microsoft or the maker of the component. Click 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.

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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 294). Then click the Hardware tab, and click the Hardware Profiles button (see Figure 14-9).

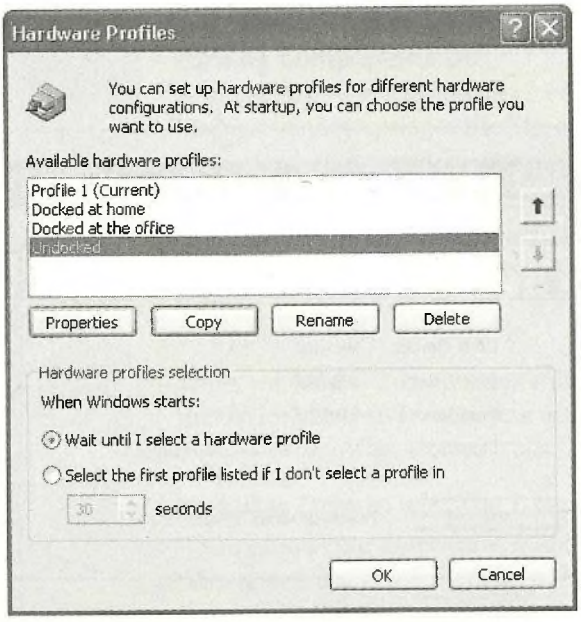


Figure 14-9:
Every computer is equipped with a hardware profile named Profile 1. Creating a new profile is simply a matter of copying the existing profile, creating a new name for the copy, and making changes to it. Use the option buttons at the bottom to specify how long you want Windows to display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

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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.

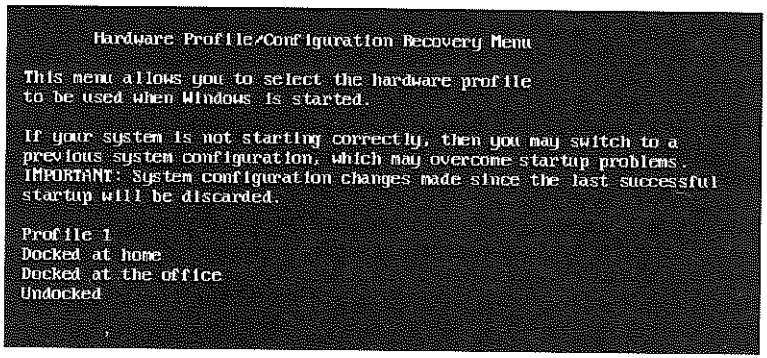


Figure 14-10: *Every time you turn on your Windows PC, you'll be shown this listing of hardware profiles. Highlight the profile you want by pressing the up and down arrow keys; press the Enter key when you've highlighted the one you want. Windows loads only the drivers for the hardware you've turned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

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CHAPTER
15

Joining, Compressing, and Encrypting Disks

Files and folders, as you've probably noticed, have a tendency to multiply. Creating new documents, installing new software, and downloading new files can fill up even the largest disk drives in no time—especially if, as Microsoft fervently hopes, you get heavily into music, pictures, and video. Fortunately, Windows XP Professional offers a number of ways to expand the amount of space on your drives: schemes called *dynamic disks* and *disk compression*.

For many people, security is another concern. Files on your drives may contain confidential financial data for your company, top-secret government research, or—worse—the holiday gift list for your family. Windows XP Professional has a solution for this problem too, called the Encrypting File System (EFS).

You can skip this entire chapter, if you wish, and get along quite well without using any of these features. They're strictly optional. But if you aspire to wear the Power User T-shirt, read on.

Note: Dynamic disks, disk compression, and EFS all require the *NTFS file system* on your computer's disk drives; they're absent if you've chosen the FAT 32 file system instead. To find out the benefits and drawbacks of NTFS, as well as how to convert FAT 32 drives to NTFS, see Appendix A.

Dynamic Disks

Suppose you've run out of space on your first hard drive, and have installed a second one to collect the overflow. Thanks to a Windows XP Pro feature called *dynamic disks*, you don't have to move files to the new drive or reorganize your folder scheme.

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Instead, you can make the new drive fold its space seamlessly with the first's, so that you suddenly have more disk space on your "one" combo drive.

How Dynamic Disks Work

If this setup intrigues you, a bit more technical explanation is required.

When you (or your PC maker) first installed Windows XP, it configured each drive as a *basic disk*—a disk with its own drive letter. But before you can combine two actual drives into one volume, you must first convert them into a more flexible format that Microsoft calls a *dynamic disk*.

The good news is that you can convert a basic disk into a dynamic disk without losing any data on the drive. (The actual steps, as you'll find out shortly, are easy indeed.) The bad news is that you can't change a dynamic disk *back* to a basic disk, unless you erase all of the data stored there.

And why would you want to? Because dynamic disks, for all their flexibility, also have some limitations. Before you proceed with converting basic disks to dynamic disks, assume a reclining position and read the following fine print:

- Once you've combined two physical disks into an über-disk (technically called a *spanned volume*), a fatal problem on *one* of the two hard drives will make you lose all of the data on *both* drives—an event that can ruin your whole morning. Keeping regular backups of your spanned volume is critically important (see Chapter 16).
- Dynamic disks are a specialty of Windows XP Pro only. No other version of Windows can read them (not even Windows XP Home Edition).

UP TO SPEED

Volumes Defined

You won't get far in this chapter, or at PC user group meetings, without understanding a key piece of Windows terminology: *volume*.

For most people, most of the time, volume means "disk." But technically, there's more to it than that--a distinction that becomes crucial if you explore the techniques described in this chapter.

If you open your My Computer window, you'll see that each disk in your PC has its own icon and drive letter (C:, for example). But each icon isn't necessarily a separate disk. It's possible that you, or somebody in charge of your PC, has split a single drive into multiple *partitions* (Appendix A), each with a separate icon and drive letter. Clearly, the world needs a term for "an icon/drive letter in My Computer, whether it's a whole disk or not." That term is *volume*.

In Windows XP Pro, you can do more than partition one hard drive into multiple volumes--you can also do the reverse, as described in this chapter. If you've installed more than one hard drive, you can actually request that Windows represent them on the screen as *one* volume. This way, you can have as many hard disk drives in your computer as you want and combine their storage space into a unit, represented by one icon and drive letter.

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- A dynamic disk can contain only one operating system. You can't *dual boot* (choose which of two operating systems to use each time you turn on the PC), as you can with basic disks.
- To convert a hard drive to a dynamic disk, it must set aside an invisible storage area to hold a *dynamic disk database.* If you partitioned the drive using Windows 2000 or XP Professional, then Windows already reserved enough space for this purpose. But if the drive was partitioned with another operating system, you may have to erase it before converting it to a dynamic disk.
- Dynamic disks don't work on laptops, removable disks, disks connected by USB cables or IEEE 1394 (FireWire) cables, or disks connected to shared SCSI buses. If your disks fall into any of these categories, Windows XP won't let you convert them to dynamic disks.

Converting a Basic Disk to a Dynamic Disk

If you haven't yet been scared off by all of these cautions, and are ready to convert your basic disks to dynamic disks, the procedure is simple. First, back up the disk you plan to convert. You probably won't need it, but it's a good idea to back up a disk before performing any kind of traumatic surgery to it.

Next, log on to the computer as its Administrator (page 517), and exit any programs that might be running on the disk you plan to convert.

You convert disks and manage the dynamic volumes on them using a special window called the Disk Management console. To open it, use any of these methods:

- 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.

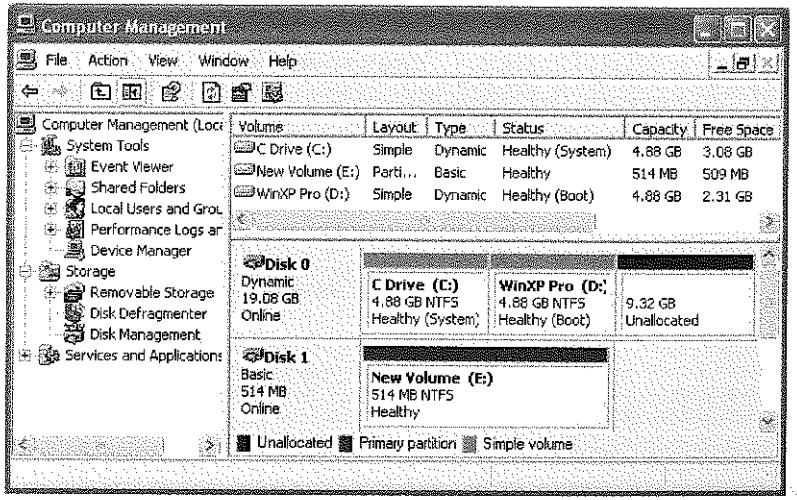


Figure 15-1: *The Disk Management console is the central toolbox for all of your dynamic disk–related tasks. This is where you convert basic disks to dynamic disks, and create the dynamic volumes on your disks.*

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- 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.

Once this window is before you, follow these steps:

1. **Click the Disk Management icon under Storage in the left pane of the Computer Management console.**

   You see a display of your drives and the partitions on them, as shown in Figure 15-1.

   The top part of the window lists the partitions on your computer. The bottom part contains a horizontal box representing each drive on your computer, with smaller boxes inside indicating the partitions on each drive. Notice that the header box for each drive indicates the number of the drive in your system, its capacity, whether or not it's online, and the word "Basic" (indicating that it's currently a basic disk).

2. **Right-click the header box for the drive, as shown in Figure 15-2; from the shortcut menu, choose Convert to Dynamic Disk.**

   A Convert to Dynamic Disk dialog box appears (Figure 15-2, bottom left), in which you select the disk(s) you want to convert.

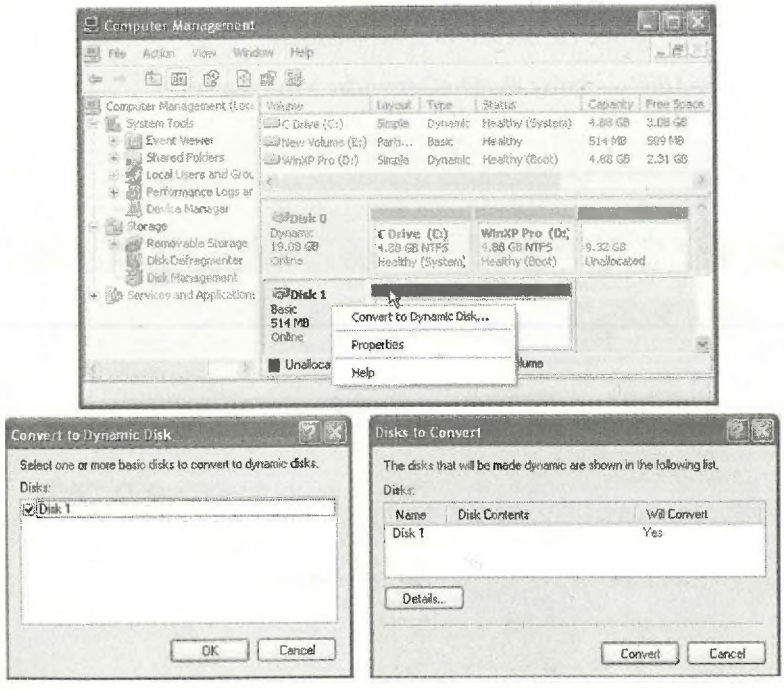


Figure 15-2:
Top: To convert a basic disk to a dynamic disk, right-click the header box for the drive and choose Convert to Dynamic Disk from the shortcut menu. Don't right-click one of the partitions—you must click the header box.

Bottom left: The Convert to Dynamic Disk dialog box lists the drives that are eligible for conversion to dynamic disks. You can even select and convert several disks at once.

Bottom right: The Disks to Convert dialog box lists the dynamic volumes that Windows XP will automatically create on your newly converted drives.

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3. Click OK.

   If you're converting a disk that contains basic partitions, a Disks to Convert dialog box appears (Figure 15-2, bottom right).

   If you click a disk and then click Details, a Convert Details dialog box appears, listing the dynamic volumes that you're about to create. (All of the standard partitions on the drive are converted into *simple* dynamic volumes—that is, they aren't yet combined into *spanned* volumes. That step comes later.)

4. Click the Convert button.

   If Windows XP detects other operating systems on your disk, you'll be warned that they won't be able to start up the PC after the conversion. If you're converting the disk that contains Windows XP Pro itself, you'll have to restart the PC.

   Otherwise, though, the conversion process takes only a few seconds. After restarting (if necessary), log on and open the Disk Management console again. As shown in Figure 15-3, the conversion is complete.

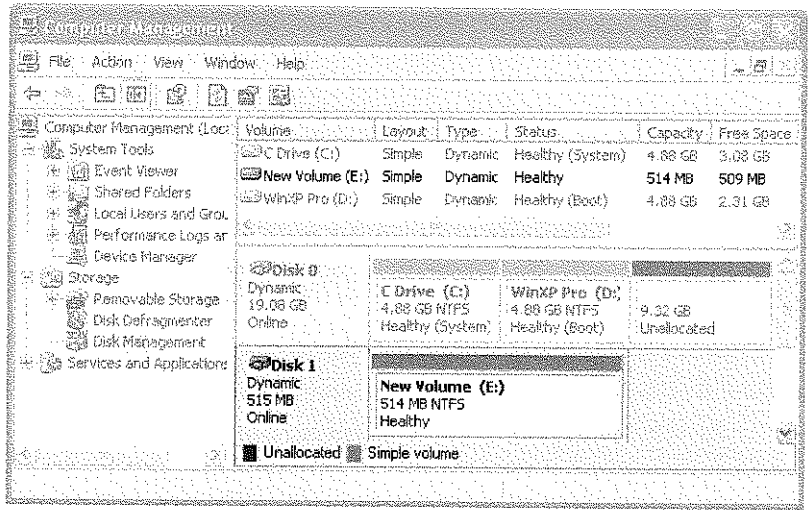


Figure 15-3: *Now the header box for your disk says "Dynamic" rather than "Basic," and what used to be partitions on the disk (with blue header bars) are now simple volumes (with red header bars).*

Three Uses for Unallocated Space

If you've installed a new hard drive, you'll see, in the Disk Management window, that it consists of *unallocated space*—disk space that doesn't belong to any volume yet. It's just sitting there, unaccounted for, unusable, waiting for you to make it part of one volume or another.

Whenever you find yourself with unallocated space, you get to discover the flexibility of dynamic disks. If you right-click an unallocated area in one of the disk boxes and

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choose New Volume from the shortcut menu, you'll see that you can choose any of three options: Simple, Spanned, or Striped (see Figure 15-4). Here's a rundown of each:

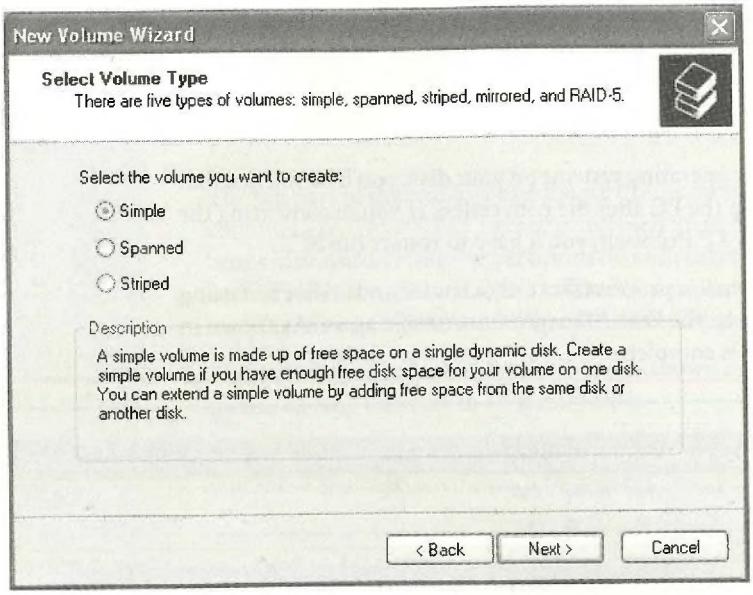


Figure 15-4: *The Select Volume Type screen of the New Volume Wizard displays the dynamic volume types that you can create on your computer. Click one to read a description at the bottom of the dialog box.*

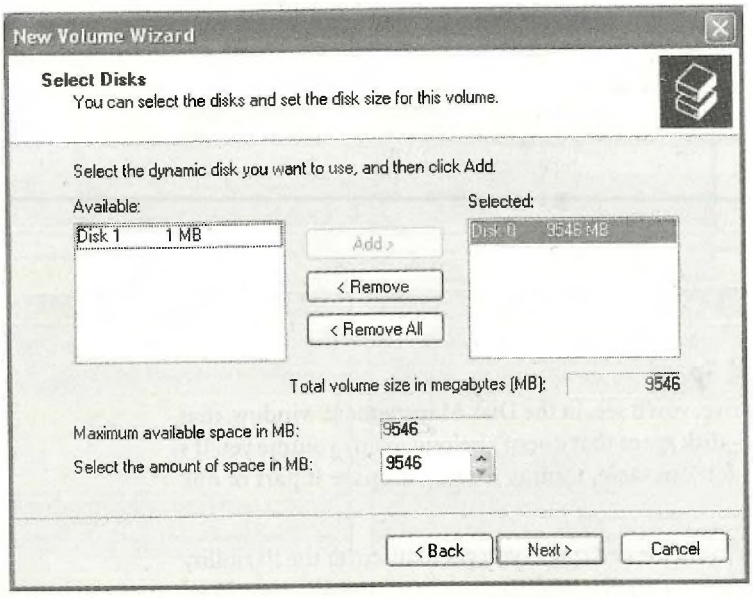


Figure 15-5: *On the Select Disks screen, you specify where you want to get the unallocated space that the wizard will use to create the dynamic volume. When creating a simple volume, you can only select one disk, but for spanned or striped volumes, you can select up to 32.*

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Creating a simple volume

A *simple volume*, on a dynamic disk, is a lot like a partition on a basic disk. It's a subdivision of the hard drive that looks and acts exactly like a separate disk, complete with its own drive letter and icon in your My Computer window.

To make one, follow these steps, beginning with the New Volume Wizard screen shown in Figure 15-4:

1. **Click Simple (Figure 15-4) and then click Next.**

   The Select Disks screen appears (Figure 15-5).

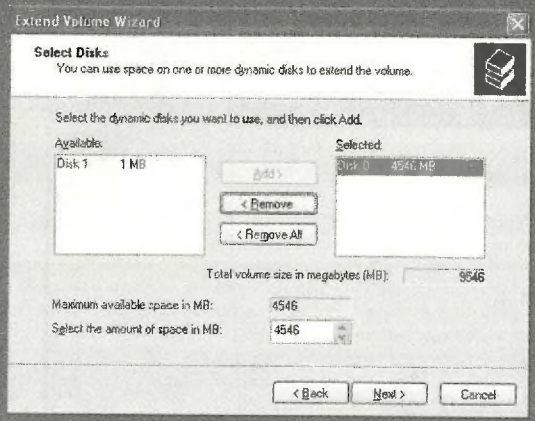
2. **Specify the size of the volume you want to create (in megabytes) in the "Select the amount of space in MB" box.**

   Often, you'll want to leave the maximum number here, so that you turn *all* of the unallocated space into a single new volume—but you don't have to. You can chop up the space into a number of different volumes, if you like.

POWER USERS' CLINIC

Extending a Volume

One big advantage of dynamic disks is that you can extend an existing volume whenever you feel like it, just by allocating additional disk space to it. If, for example, you run out of space on a volume you've named Data, and you still have some unallocated space on some other disk, you can simply add it to the Data volume to make it bigger. The unallocated space you specify becomes a permanent part of the Data volume. (Note that this is a one-way trip. Once you've added free space to a dynamic volume, it becomes part of that volume permanently, or at least until you delete the volume—and its data—and re-create it.)



The disk space you use to extend the volume can come from either the same disk or another dynamic disk (in which case you create a *spanned* volume). Note, though, that you can't extend the *system* volume, nor any volume that was originally a partition created by another operating system.

To extend an existing dynamic volume, right-click it in the Disk Management window; choose Extend Volume from the shortcut menu. The Extend Volume Wizard appears, consisting of nothing but a Select Disks screen shown here. When you've made your selections, click Next and then Finish to complete the wizard.

When you look at the Disk Management display, the new space you've allocated appears at first to be an entirely new volume, with a separate box in the drive display. Look more carefully, however, and you'll see that both the original volume and the new one have the same drive letter. Furthermore, when you look at the drive list at the top of the window, the volume appears only once, with the capacity reflecting the total of the original volume and the extension you just created.

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3. Click Next.

   The Assign Drive Letter or Path screen appears (Figure 15-6, top).

4. Specify the drive letter you want to assign to the volume.

   If you like, you can also turn the volume into a sub-folder of an existing NTFS folder (a technical trick described on page 490).

5. Click Next. On the Format Volume screen (Figure 15-6, bottom), specify the NTFS file system. Type a name for your new volume into the "Volume label" box. Click Next, and then Finish.

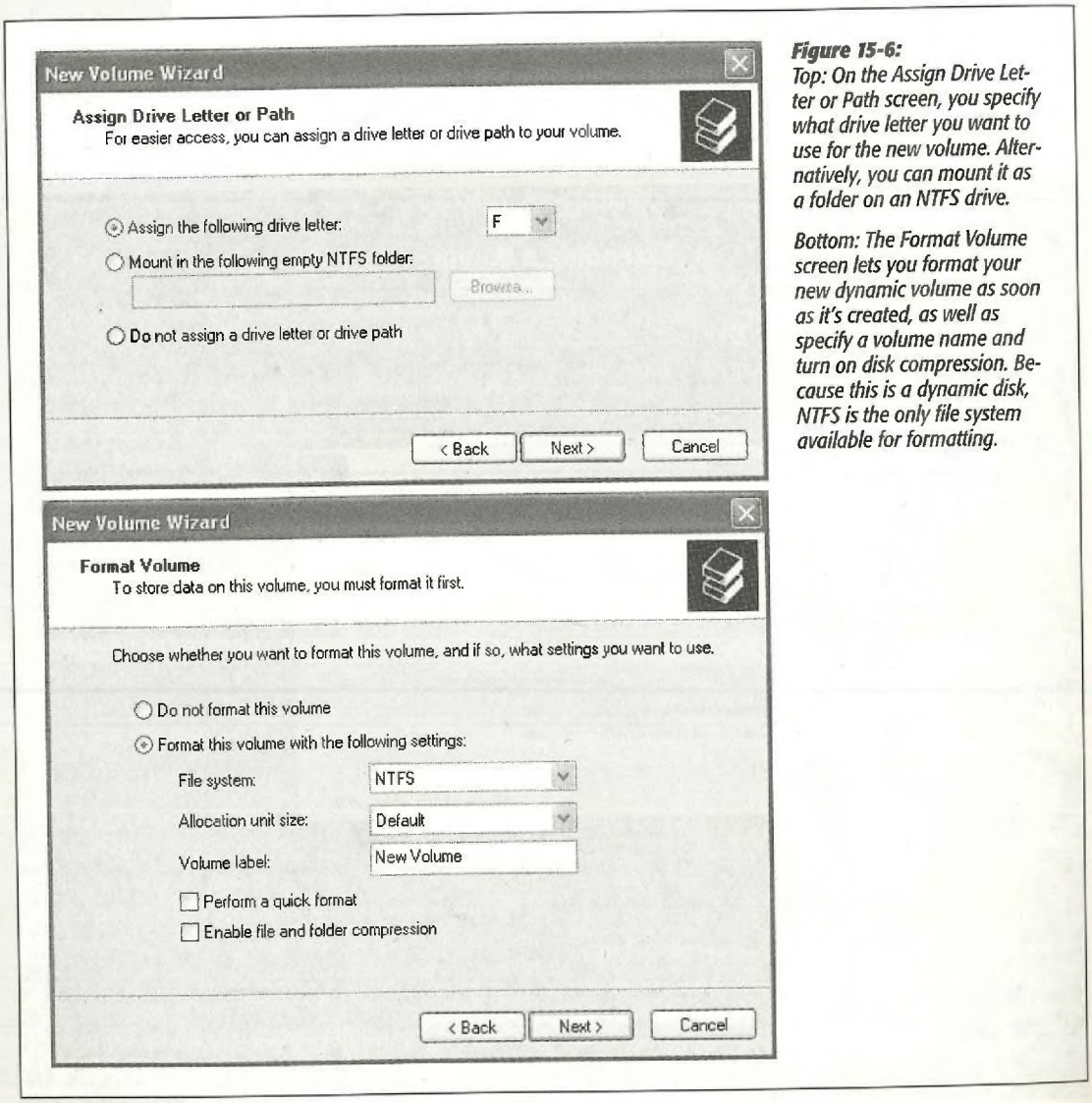


Figure 15-6:
Top: On the Assign Drive Letter or Path screen, you specify what drive letter you want to use for the new volume. Alternatively, you can mount it as a folder on an NTFS drive.

Bottom: The Format Volume screen lets you format your new dynamic volume as soon as it's created, as well as specify a volume name and turn on disk compression. Because this is a dynamic disk, NTFS is the only file system available for formatting.

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Presto: What used to be unallocated space (denoted by a black header bar in the Disk Management window) is now a simple volume (with a red header bar). The new volume now appears in your My Computer window—and everywhere else—with the drive letter you assigned to it. It's ready to store data.

Tip: You can delete a dynamic volume as easily as you created it. Just right-click it in the Disk Management window and select Delete Volume from the shortcut menu. Doing so deletes the entire volume, erasing all the data on it and removing its space from any spanned or striped space on other disks.

Creating a spanned volume

Suppose you've managed to shoehorn every byte of data you possibly can onto your PC's one hard drive. You decide to install a second hard drive, to give you more space.

But then what? You don't want to spoil the carefully organized folder structure on your old hard drive by moving parts of it to the new drive; you just want to continue to build on your folders as they are.

The solution, as you know if you read the beginning of this chapter, is to create a *spanned volume*, a single disk icon (and drive letter) that's actually composed of the space from both your old and new drives.

The first order of business (after restarting the computer) is to make sure that Windows XP has recognized the new drive. Messages inform you that the operating system has located a new hardware device and identified it as a hard drive. When you launch the Disk Management console, a new drive appears in the list, with a great big block of unallocated space for you to fill, as shown in Figure 15-7.

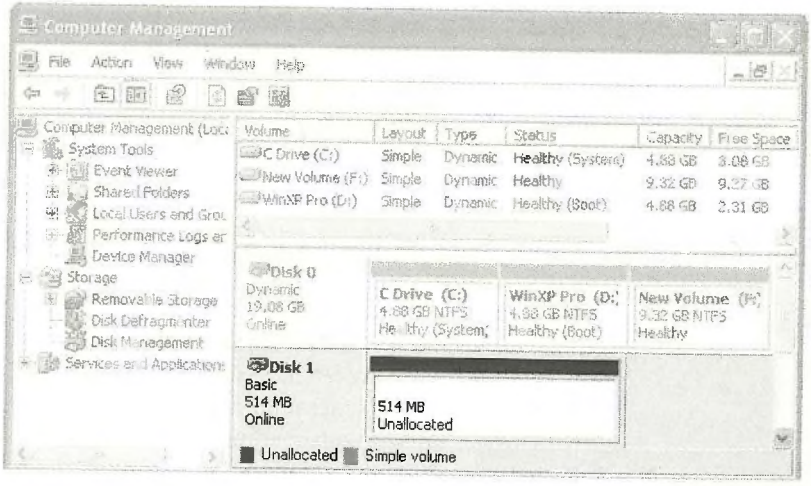


Figure 15-7: *When you install a new hard drive in your computer, it appears in the Disk Management console as a large block of unallocated space. Of course, you quickly notice that the new drive is a basic drive; therefore, all you can do is create a basic partition on it.*

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Before you can use the new drive to enlarge your existing volume, you must convert it to a dynamic disk, just as described on page 459. At that point, you're free to right-click your original volume (in the Disk Management window) and open the Extend Volume Wizard.

When the Select Disks screen appears (Figure 15-8, top), you'll see that the only available unallocated space in your computer is on your new drive. Select it in the Available column and click Add to add it to the Selected column. Specify how much of the new drive you want to add to the volume (or, to add *all* of it to your original drive, do nothing). Finally, click Next and then Finish.

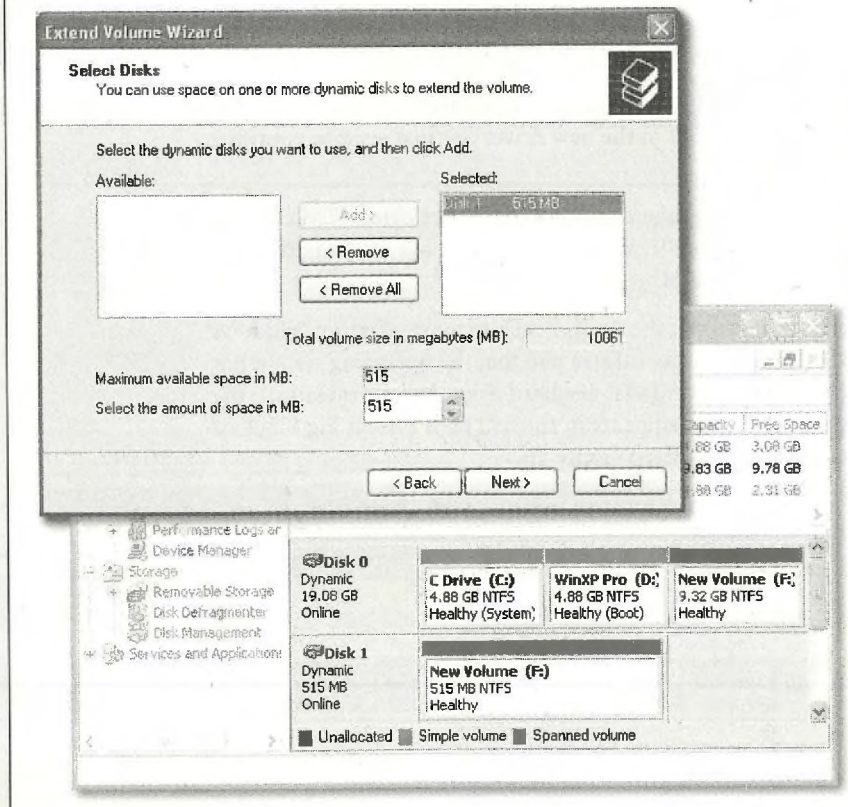


Figure 15-8:
Top: When extending a volume to another disk, click its name in the Available column before adding it to the Selected column.

Bottom: A dynamic volume extended to another disk appears in the Disk Management console with the same color header bar and the same drive letter. Note, too, that the volume list in the upper-right quadrant of this dialog box identifies this volume as "Spa…" (which, if you could see the whole word, would say "Spanned").

Notice now that your original volume and your new drive both have a purple header bar and use the same drive letter, as shown at bottom in Figure 15-8. You now have a spanned volume using space on both of your hard drives. Your hard drive is now effectively bigger, and you can continue to amass new files at your accustomed rate.

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Creating a striped volume

As you now know, a *spanned volume* is like a virtual hard drive made up of storage space from two to 32 dynamic disks. When Windows XP saves data onto a spanned volume, it completely fills up the allotted space on one drive, then proceeds to the next drive in the volume, until the allotted space on all of the drives is full.

A *striped volume* is similar, in that it's a single volume made up of space from several actual disks, but the way Windows XP saves data to the drives is different. Instead of filling up one drive and proceeding to the next one, Windows XP saves pieces of each file on more than one disk. Because more than one hard drive is saving and reading data in parallel, a speed benefit can theoretically result.

The truth is, though, that the differences are measured in milliseconds—thousandths of a second—so it's generally not worth creating striped volumes on everyday PC workstations. (On corporate file servers that handle hundreds or thousands of file access requests per minute, it's a different story. The cumulative savings in access times can be significant.)

If you're still tempted to create a striped-volume set, the process is nearly identical to creating a new *spanned* volume (see the box below). The only difference is that you must use the same amount of space on each of the drives you select. For example, if you have one gigabyte of unallocated space on Disk 0 and five gigabytes of unallocated space on Disk 1, your striped volume can be no larger than two gigabytes, one from each drive.

Compressing Files and Folders

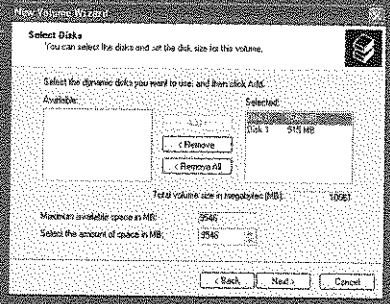
Although the hard drives made these days have greater capacities than ever, programs and files are much bigger, too. Running out of disk space is still a common problem. Fortunately, Windows XP Pro is especially effective at compressing files and folders to take up less disk space.

POWER USERS' CLINIC

Creating a New Spanned Volume

The flexibility of dynamic disks never ends. If you find yourself with bits of unallocated space on two or more dynamic disks, you can actually sweep these scraps together into a single new volume—a spanned volume—that behaves, in Windows, as though it's a single "hard drive."

To do this, start in the Disk Management window (Figure 15-2). Right-click any unallocated space on any of the disks and select New Volume from the shortcut menu. On the Select Volume Type screen, click the Spanned option. On the Select Disks screen, the unallocated space you clicked appears in the Selected column, and any unallocated space on other dynamic disks appears in the Available column, which is shown here:



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Compressing files and folders can also be useful when you want to email files to someone without dooming them to an all-night modem-watching session. That's why Microsoft has endowed Windows XP with two different schemes for compressing files and folders: *NTFS compression* for storing files on your hard drive, and *zipped folders* for files that might have to be transferred.

NTFS Compression

If Windows XP Pro was installed on your PC when you bought it, or if you upgraded your PC from Windows 2000, or if you erased your hard drive before installing Windows XP, then your hard drive is probably formatted using a file system called *NTFS* (short for *NT file system*; see page 636 for details).

Most people can live a long and happy life without knowing anything about NTFS. If you work in a corporation, you might be grateful for the additional security it offers to Windows XP Pro fans (Chapter 17), and leave it at that. Now and then, however, you'll read about other features that are available *only* if your hard drive was prepared using NTFS—and this is one of those cases.

Tip: To find out whether or not your hard drive uses NTFS formatting, choose Start→My Computer. Right-click the hard drive icon; choose Properties from the shortcut menu. In the resulting dialog box, you'll see either "File system: NTFS" or "File system: FAT 32." (If it says FAT 32, you probably upgraded your PC from Windows 98 or Windows Me.) Unfortunately, special NTFS features like automatic compression aren't available to you, but you can upgrade your drive formatting to NTFS without having to erase it. See page 638 for instructions.

The NTFS compression scheme is especially likable because it's completely invisible to you. Windows XP Pro automatically compresses and decompresses your files, almost instantaneously. At some point, you may even forget you've turned it on. Consider:

UP TO SPEED

Data Compression

Data compression is the process of replacing repetitive material in a file with shorthand symbols. For example, if a speech you've written contains the phrase *going forward* 21 times, a compression scheme like the one in NTFS may replace each occurrence with a single symbol, making the file that much smaller. When you reopen the file later, the operating system almost instantaneously restores the original, expanded material.

The degree to which a file can be compressed depends on what kind of data the file contains and whether it's already been compressed by another program. For example, programs (executable files) often shrink by half when compressed. Bitmapped graphics like TIFF files squish down to as little as one-seventh their original size, saving a great deal more space.

The GIF and JPEG graphics files so popular on the Web, however, are already compressed (which is why they're so popular—they take relatively little time to download), and so they don't get much smaller if you try to compress them manually. That's one of the main rules of data compression: data can only be compressed once.

In short, there's no way to predict just how much disk space you'll save by using NTFS compression on your drives. It all depends on what you have stored there.

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- Whenever you open a compressed file, Windows quickly and invisibly expands it to its original form so that you can read or edit it. When you close the file again, Windows instantly recompresses it.
- If you send compressed files (via disk or email, for example) to a PC whose hard drive doesn't use NTFS compression, Windows XP once again decompresses them, quickly and invisibly.
- Any file you copy into a compressed folder or disk is compressed automatically. (If you only *move* it into such a folder from elsewhere on the disk, however, it stays compressed or uncompressed—whichever it was originally.)

Compressing files, folders, or disks

To turn on NTFS compression, right-click the icon for the file, folder, or disk whose contents you want to shrink. Choose Properties from the shortcut menu. Click the Advanced button, and in the resulting dialog box, turn on "Compress contents to save disk space" (Figure 15-9). If you have selected a folder for compression, you are prompted as to whether you also want to compress the files and subfolders within it.

Many Windows veterans wind up turning on compression for the entire hard drive.

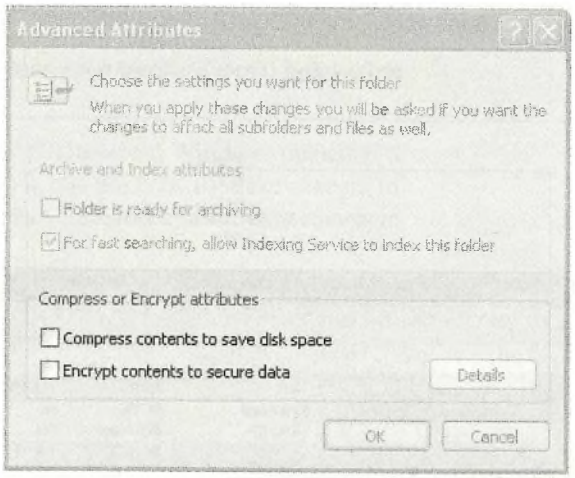


Figure 15-9:
If you don't see the "Compress contents to save disk space" checkbox (highlighted here), then your hard drive probably doesn't use the NTFS formatting scheme.

It can take Windows XP several hours to perform the initial compression of every file on the drive. (If you plan to go see a movie while Windows is working, though, quit all your programs first. Otherwise, the compression process will halt whenever it encounters an open file—waiting for you to close the file or tell Windows to ignore it—and you'll find the job only half done when you return.)

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When Windows is finished compressing, the compressed file and folder icons appear in a different color, a reminder that Windows is doing its part to maximize your disk space. (If they don't change color, then somebody—maybe you—must have turned off the "Show encrypted or compressed NTFS files in color" option described on page 87.)

When you look at the Properties dialog box for a compressed file (right-click the file and choose Properties from the shortcut menu), you can see two file sizes. The Size value indicates the actual (uncompressed) size of the file, and the Size On Disk value is the compressed size of the file, that is, the amount of disk space it is occupying.

Zipped Folders

As noted above, NTFS compression is great for freeing up disk space while you're working at your PC. But when you email your files to somebody else or burn them to a CD, Windows XP always decompresses them right back to their original sizes first. And, of course, NTFS compression isn't even an option if your hard drive doesn't *use* NTFS formatting (page 636).

Fortunately, there's another way to compress files: Zip them. If you've ever used Windows before, you've probably encountered Zip files. Each one is a tiny little suitcase, an *archive*, whose contents have been tightly compressed to keep files together, to save space, and to transfer them online faster (see Figure 15-10). Use Zip files when you want to email something to someone, or when you want to pack up a completed project and remove it from your hard drive to free up space.

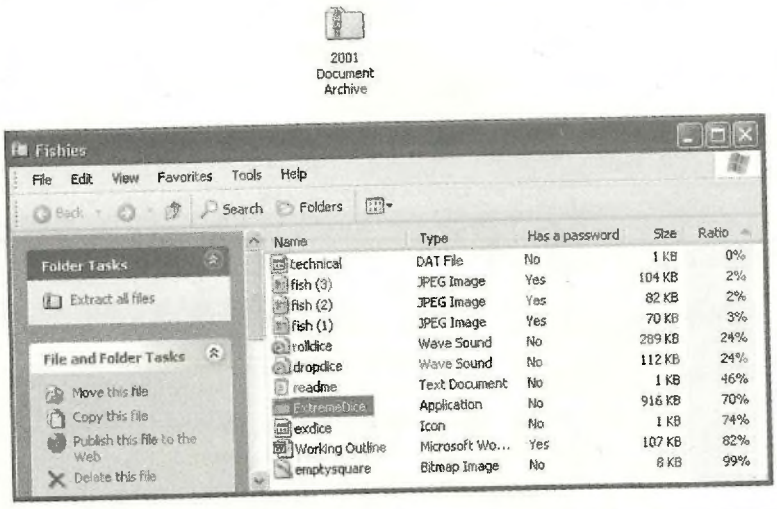


Figure 15-10: *Top: A Zip archive looks like an ordinary folder—except for the tiny zipper.*

Bottom: Double-click one to open its window and see what's inside. Notice (in the Ratio column) that JPEG graphics and GIF graphics usually don't become much smaller than they were before zipping, since they're already compressed formats. But word processing files, program files, and other file types reveal quite a bit of shrinkage.

Creating zipped folders

In Windows XP, you don't even need a shareware program like PKZip or WinZip to create or open Zip files. You can create a Zip archive in either of two ways:

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- Right-click any blank spot on the desktop or an open window. From the shortcut menu, choose New→Compressed (zipped) Folder. Type a name for your newly created, empty archive, and then press Enter.

  Now, each time you drag a file or folder onto the archive's icon (or into its open window), Windows automatically stuffs a *copy* of it inside.

  Of course, you haven't actually saved any disk space, since now you have two copies of the original material (one zipped, one untouched). If you'd rather *move* a file or folder into the archive—in the process deleting the full-size version and saving disk space—right-drag the file or folder icon onto the archive icon. Now from the shortcut menu, choose Move Here.

- To turn an existing file or folder *into* a zipped archive, right-click its icon. (To zip up a handful of icons, select them first, then right-click any *one* of them.) Now, from the shortcut menu, choose Send To→Compressed (zipped) Folder. You've just created a new archive folder *and* copied the files or folders into it.

Tip: At this point, you can right-click the zipped folder's icon and choose Send To→Mail Recipient. Windows automatically whips open your email program, creates an outgoing message ready for you to address, and attaches the zipped file to it–which is now set for transport.

Working with zipped folders

In many respects, a zipped folder behaves just like any ordinary folder. Double-click it to see what's inside.

If you double-click one of the *files* you find inside, however, Windows opens up a *read-only* copy of it—that is, a copy you can view, but not edit. To make changes to a read-only copy, you must use the File→Save As command and save it somewhere else on your hard drive.

Note: Be sure to navigate to the desktop or the My Documents folder, for example, before you save your edited document. Otherwise, Windows will save it into an invisible temporary folder, where you may never see it again.

HISTORY CLASS

PKZip

The Zip archive format was developed in the late 1980s by Phil Katz, a pioneer of PC compression technology. Katz's original product, PKZip, was a DOS-based archiving program that soon became an industry standard.

There have been many other archive compression standards over the years, but none of them became as ubiquitous as the Zip format. Every program today that creates or manipulates Zip files, including Windows XP, owes a debt of thanks—if not a free T-shirt or two—to Phil Katz.

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To decompress only some of the icons in a zipped folder, just drag them out of the archive window; they instantly spring back to their original sizes. Or, to decompress the entire archive, right-click its icon and choose Extract All from the shortcut menu (or, if its window is already open, click the "Extract all files" link on the task pane). A wizard asks you to specify where you want the resulting files to wind up.

Encrypting Files and Folders

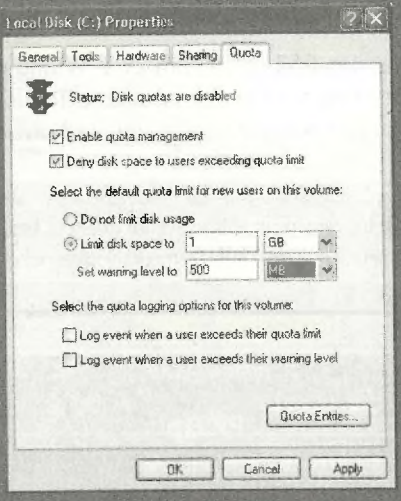
If your My Documents folder contains nothing but laundry lists and letters to your mom, data security is probably not a major concern for you. But if there's some stuff on your hard drive that you'd rather keep private—you know who you are—Windows XP Professional can help you out. The Encrypting File System (EFS) is an NTFS feature that stores your data in a coded format that only you can read.

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 618).

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 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.

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The beauty of EFS is that it's effortless and invisible to you, the authorized owner. Windows XP automatically encrypts your files before storing them on the drive, and decrypts them again when you want to read or modify them. Anyone else who logs on to your computer, however, will find these files locked and off-limits.

If you've read ahead to Chapter 17, of course, you might be frowning in confusion at this point. Isn't keeping private files private the whole point of XP's *accounts* feature? Don't XP Pro's *NTFS permissions* (page 544) keep busybodies out already?

Yes, but encryption provides additional security. If, for example, you are a top-level agent assigned to protect your government's most closely guarded egg salad recipe, you can use NTFS permissions to deny all other users access to the file containing the information. Nobody but you can open the file in Windows XP.

However, a determined intruder from a foreign nation could conceivably boot the computer using *another* operating system—one that doesn't recognize the NTFS permissions system—and access the hard drive using a special program that reads the raw data stored there. If, however, you had encrypted the file using EFS, that raw data would appear as gibberish, foiling your crafty nemesis.

Using EFS

You use EFS to encrypt your folders and files in much the same way that you use NTFS compression. To encrypt a file or a folder, you open its Properties dialog box, click the Advanced button, turn on the Encrypt Contents To Secure Data checkbox, and click OK (see Figure 15-11). (For a quicker way, see page 667.)

Depending on how much data you've selected, it may take some time for the encryption process to complete. Once the folders and files are encrypted, they appear in a different color from your compressed files (unless, once again, you've turned off the "Show encrypted or compressed NTFS files in color" option).

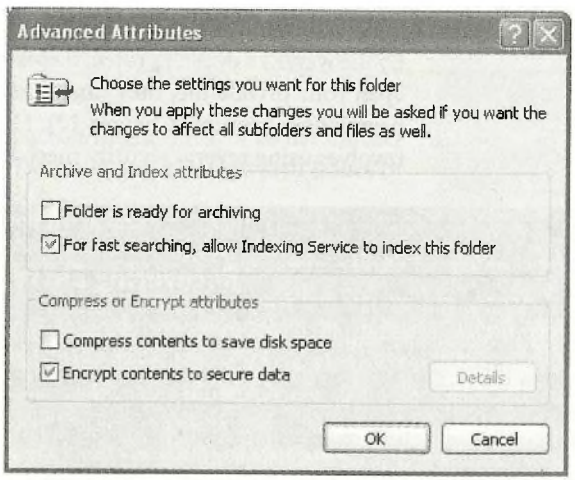


Figure 15-11:
To encrypt a file or folder using EFS, turn on the Encrypt Contents To Secure Data checkbox (at the bottom of its Properties dialog box). If you've selected a folder, a Confirm Attribute Changes dialog box appears, asking if you want to encrypt just that folder or everything inside it, too.

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Note: You can't encrypt certain files and folders: system files, or any files in the system *root folder* (usually the WINNT or Windows folder). You can't encrypt files and folders on FAT 32 drives, either.

Finally, note that you can't both encrypt *and* compress the same file or folder. If you attempt to encrypt a compressed file or folder, Windows XP will decompress it first. You can, however, encrypt files that have been compressed using another technology, such as Zip files or compressed image files.

After your files have been encrypted, you may be surprised to see that, other than their color change, nothing seems to have changed. You can open them the same way you always did, change them, and save them as usual. Windows XP is just doing its job: protecting these files with minimum inconvenience to you.

Still, if you're having difficulty believing that your files are now protected by an invisible force field, try logging off and back on again with a different user name and password. When you try to open an encrypted file now, a message cheerfully informs you that you don't have the proper permissions to access the file. (For more on Windows XP security, see Chapter 17.)

EFS Rules

Any files or folders that you move *into* an EFS-encrypted folder get encrypted, too. But dragging a file *out* of it doesn't un-protect it; it remains encrypted as long as it's on an NTFS drive. A protected file loses its encryption only when:

- You manually decrypt the file (by turning off the corresponding checkbox in its Properties dialog box).
- You move it to a FAT 32 drive.
- You transmit it via network or email—an important point. It means that if somebody can access your hard drive from across the network, they can open your encrypted files, even without knowing your account password! To protect files from prying eyes across the network, you must *also* use NTFS permissions, as described on page 544.

By the way, EFS doesn't protect files from being deleted. Even if passing evildoers can't *open* your private file, they can still *delete* it—unless you've protected it using XP's permissions feature (Chapter 17). Here again, truly protecting important material involves using several security mechanisms in combination.

GEM IN THE ROUGH

Recovering Encrypted Data

Every now and then, encrypted data becomes inaccessible. Maybe a hard-drive crash nukes your password, and therefore your ability to open your own encrypted files. Or maybe a disgruntled employee quits, deliberately refusing to divulge his password or decrypt his important files first.

Fortunately, Windows XP has a fallback mechanism—a back door. The local Administrator account on a certain PC generally has exclusive access to this feature, although, using *group policies* (page 15), it's possible to designate other account holders as recover agents, too.

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CHAPTER 16

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.

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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 16-2) to rewind your machine to its configuration the last time you remember it working well.

As Figure 16-2 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 331) 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

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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.

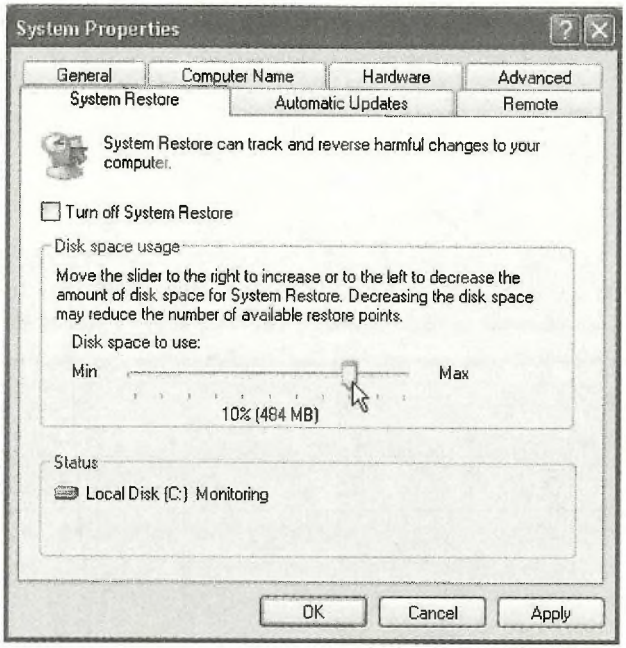
Fortunately, you can control exactly how much disk space is dedicated to this function—or turn the function off entirely—as described in Figure 16-1. (Note that turning off System Restore, even momentarily, wipes out all existing restore points.)

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 84. 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 16-1:
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.



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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 16-3), 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 16-2). 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 84) *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.

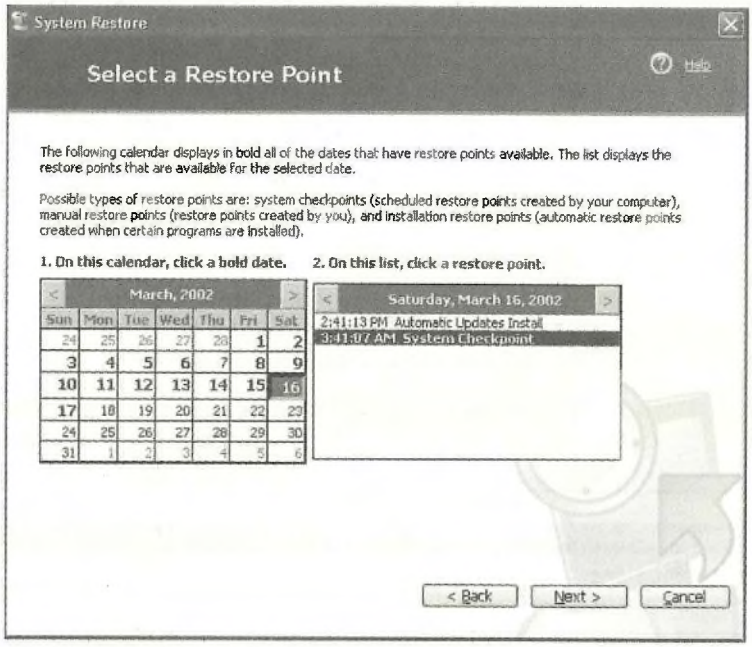
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3. Click the boldface calendar square closest to the last day you remember your PC working correctly.

   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.



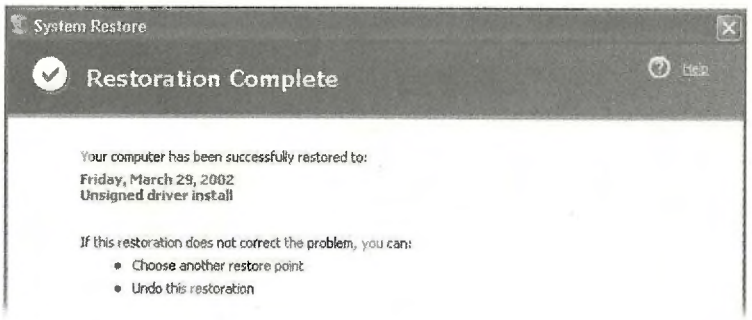


Figure 16-2:
Top: To change the month, click the < or > button at either end of the calendar. When you click a calendar square containing a bold number, the pane on the right shows the restoration points available for that date. You may find "Manual Checkpoint," which is one that you created yourself; "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 448); "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.

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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 16-2 (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 16-3). It's like getting a bigger hard drive for free.

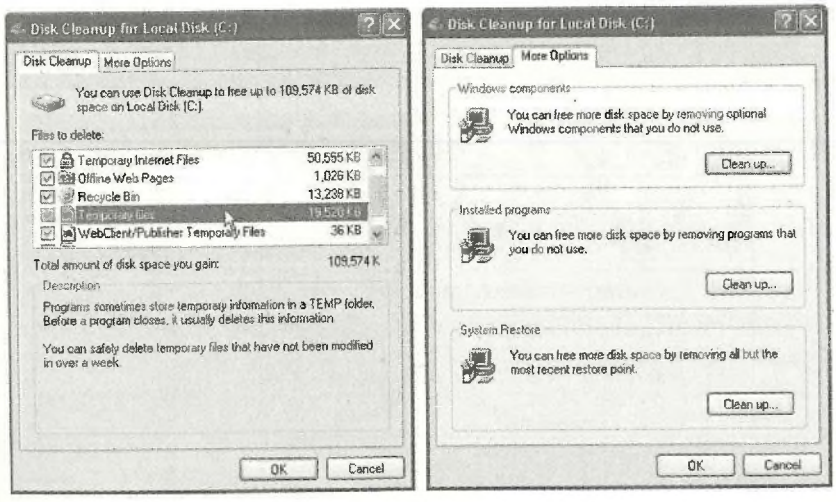


Figure 16-3: *Left: Disk Cleanup announces how much free space you stand to gain. Click View Files to see the individual file icons in their native folders, for more selective deletion.*

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

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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 16-3 (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 16-3, 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.

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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 473) 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 499), 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 470), Zip disks, DVDs, and so on. Page 440 has details.

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 16-4).

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.

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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.

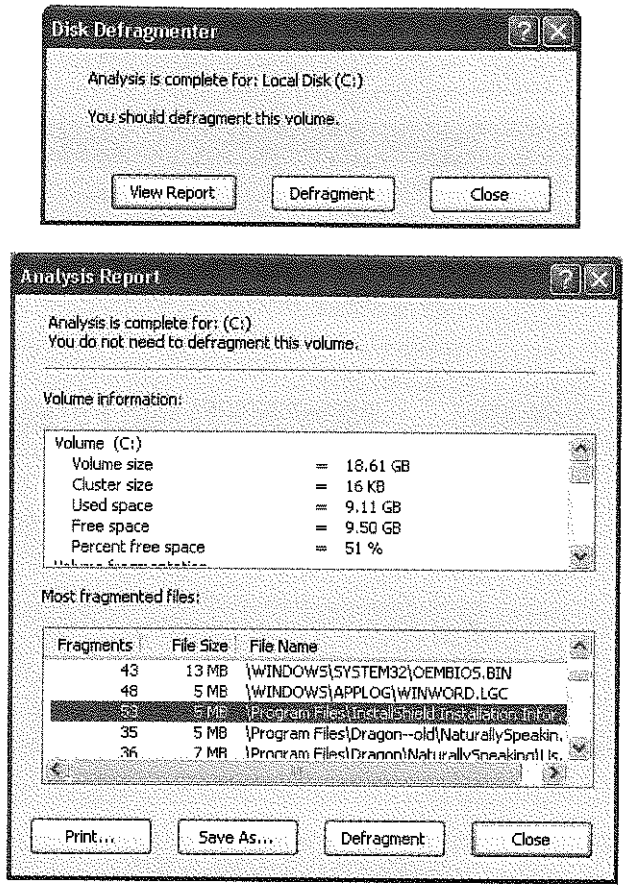


Figure 16-4:
Windows lets you know whether or not you'll gain anything by defragmenting your hard drive (top). If you're terminally curious, click View Report. A dialog box then appears (like the one here at bottom), listing each individual file on your hard drive and revealing the extent of its fragmentation.

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 16-5).

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.

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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.

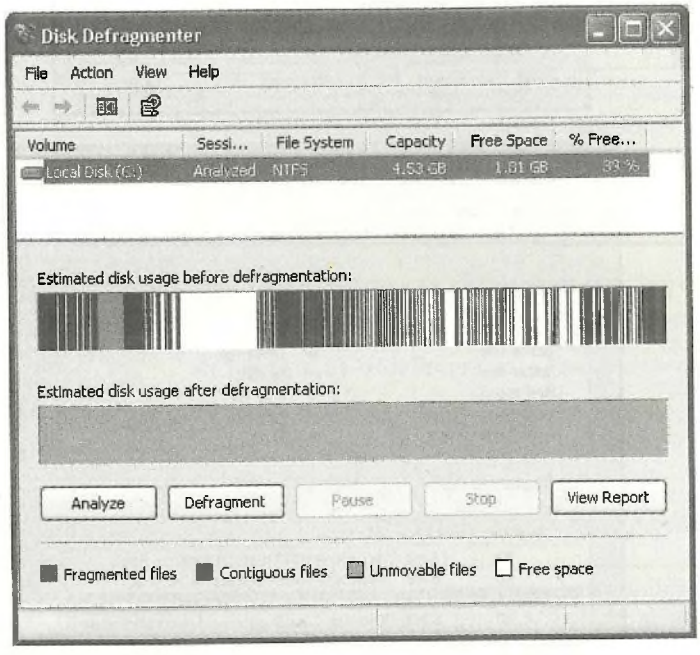


Figure 16-5:
A detailed view of the defragmentation process helps you understand what Disk Defragmenter is doing. The color of each little square shows what's going on, as the program juggles software files, system files, and data files to put each file in the best possible place. At that point of perfection, 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

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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 16-6, 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 16-6, 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 16-6. 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.

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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 618, 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.

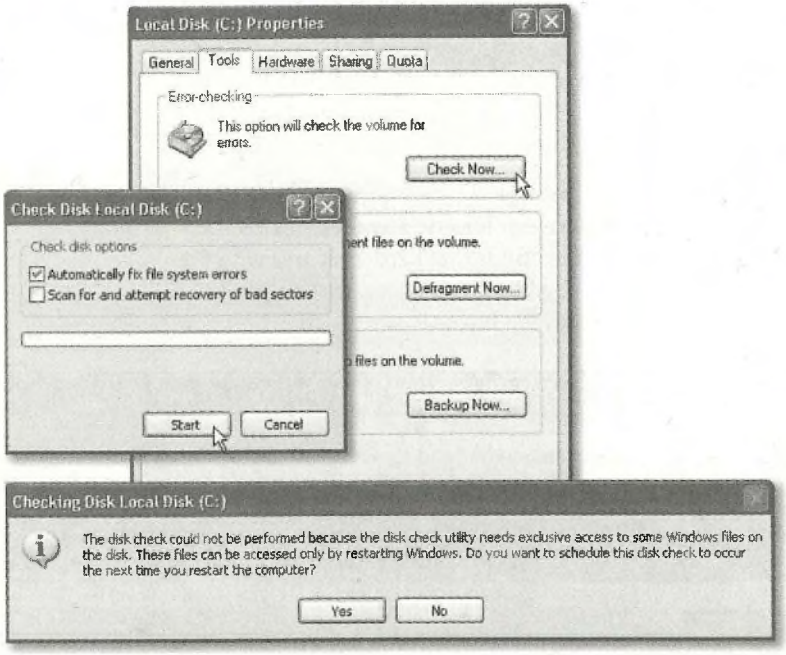


Figure 16-6:
Top: Click Check Now in the Properties dialog box for your hard drive.

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:

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- 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 16-7. 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. In truth, the Disk Management window is a software toolkit that lets you *operate* on these drives, too. For example, Chapter 15 describes in detail how you can use this window to slice and dice the free space on your drives into new, combined "virtual disks" (volumes).

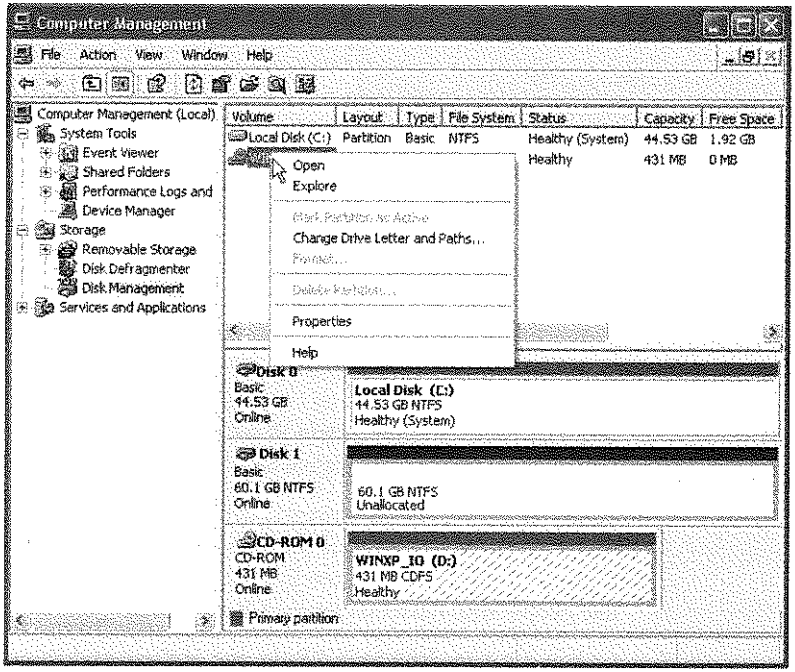


Figure 16-7: *The Drive Management window is part of the much bigger, much more technical entity known as the Computer Management console. You access it by clicking Disk Management (in the left-side pane). Then you can operate on your drives by right-clicking them. Don't miss the View menu, by the way, 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.

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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 16-8.

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.

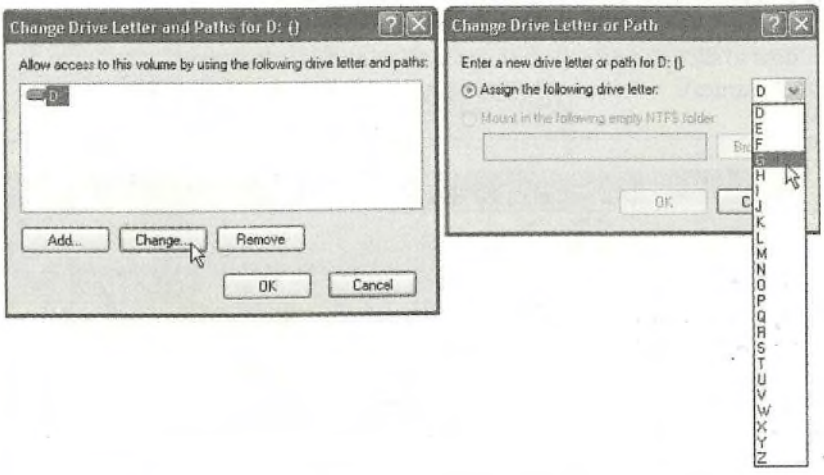


Figure 16-8: *Right-click a drive icon as shown in Figure 15-7. From the shortcut menu, choose Change Drive Letter and Paths.*

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 617.)
- 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.
- 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 616)

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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 16-7, 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 16-7); 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 618).

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.

Note: Partitioning and disk management can go even farther. You can resize your disk volumes, combine the space from multiple disks into one large volume, and perform other advanced stunts, as described in Chapter 15.

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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 16-9 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 618).

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 16-9.) 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.

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- 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.

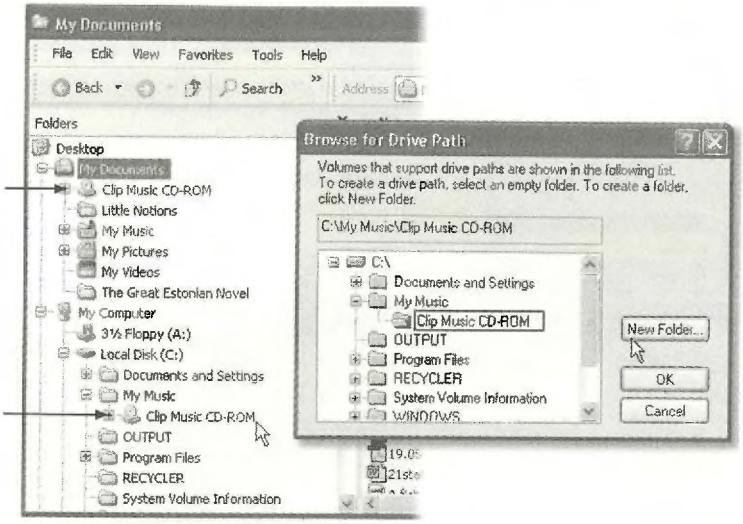


Figure 16-9:
Left: Man, how many CD drives does this guy have? Just one. But through the miracle of mounted volumes, it's appearing in as many different folders as the owner likes. You could do the same thing with a hard drive–make it appear as a folder icon on any other drive.

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 494 offers more information about switches.

To open the Task Scheduler (see Figure 16-10), 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 16-10, 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.

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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 16-10, bottom right).

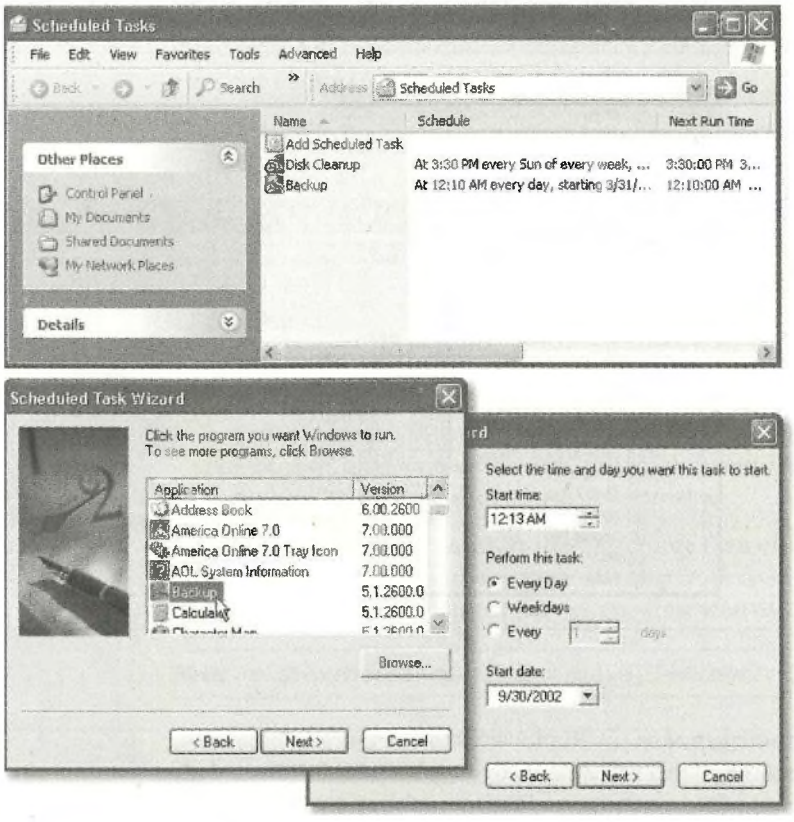


Figure 16-10:
Top: The Task Scheduler keeps a calendar for Windows XP. Tasks appear in the schedule when you enter them manually, or when other programs (such as the Maintenance Wizard) set them up. You can use the Task Scheduler window to add, modify, or remove tasks. (Make sure your computer is turned 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 16-11), where you can make several kinds of changes:

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- **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 16-11). 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.

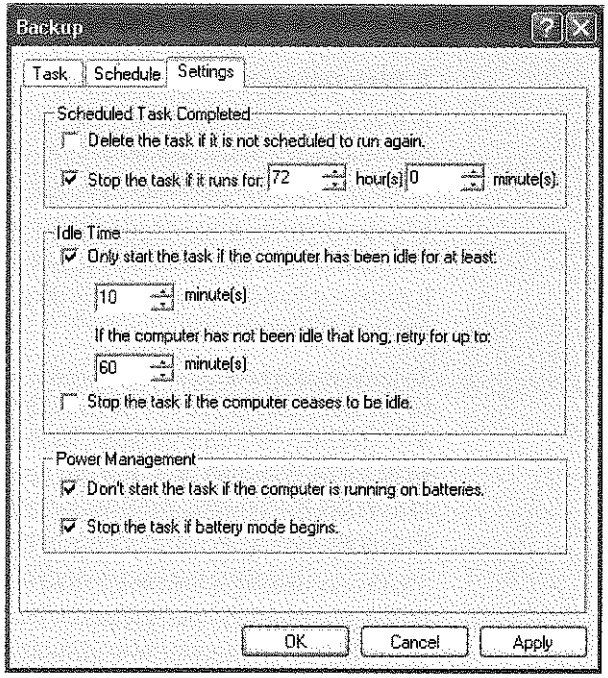


Figure 16-11:
Some of the factory settings for scheduled tasks are a bit ridiculous. For example, it's probably a good idea to stop a task if it runs longer than 4 or 5 hours, not 72 hours. In fact, except for defragging the hard drive, most scheduled tasks should take less than an hour. The bottom section 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.)

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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,

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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 519.)

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

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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 16-12. Click OK.

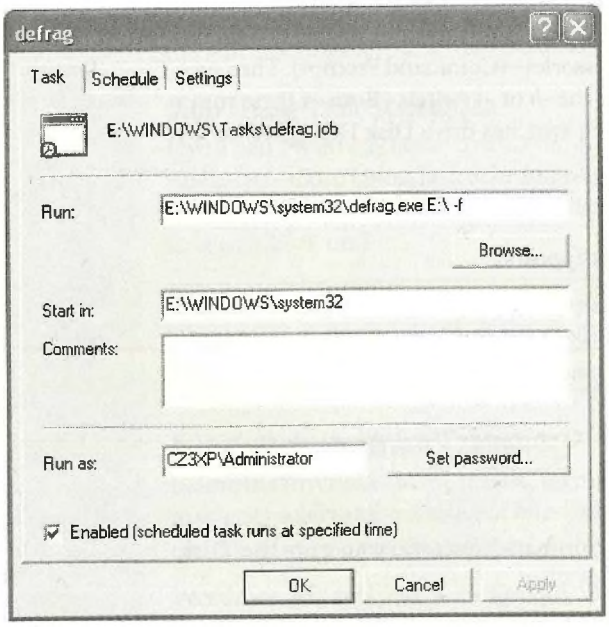


Figure 16-12:
Disk Defragmenter is ready to roll. You've just told Disk Defragmenter to defrag the E: drive, and–thanks to the "-f" switch–to run whether it thinks you need it or not.

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.

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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.

Now, if you use XP Pro in a corporation—a distinct possibility, considering its target audience—you probably don't even have to think about backing up your stuff. A network administrator generally does the backing up for you and your co-workers. (You're probably instructed to save your files on a network server PC instead of your own, so that the administrator can back up all of the employees' files in one swift move.) In that case, you can flip to more interesting sections of this chapter.

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.

Backup Hardware

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).

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.

Here's a rundown of popular removable backup disks:

- **Floppy disks.** Forget it. Unless you work with nothing more than a few text files, your stuff will never fit onto floppies.
- **Zip, Jaz, Peerless.** When it comes to removable cartridge drives like these from Iomega, consider capacity and expense. The older Zip cartridges, which hold 100 or 250 MB, may be too small for most backup purposes. The newer 750 MB drives are a better bet.

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Jaz and Peerless cartridges can hold a lot more, but they're expensive. Divide the number of megabytes by the cartridge price to figure out which is the most cost-effective.

- **Recordable CD.** Burning your backups onto blank CD-R and CD-RW (or even blank DVD) disks is another viable alternative—especially since blanks are dirt cheap. Unfortunately—and incredibly—the Windows XP Backup program doesn't recognize CD-ROM or DVD-ROM drives as backup devices.

  Many other backup programs do, however. Your CD/DVD burner may even have come with one. As long as you don't have many gigabytes of files to back up, this system can work well.

- **Tape cartridges.** Magnetic tapes are economical, retain their data for years, and offer huge capacity in a compact package. Better yet, Microsoft's Backup program works with them. Tape drives are available in either external USB versions or internal units that you install yourself.

  The main drawback of a tape system is that you can't use it for anything *other* than backups. You can't get to a file at the end of the tape without fast forwarding through all of the data that precedes it, so you wouldn't want to use these as everyday disks.

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 16-13, 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

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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 16-13, 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* (page 661) 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.

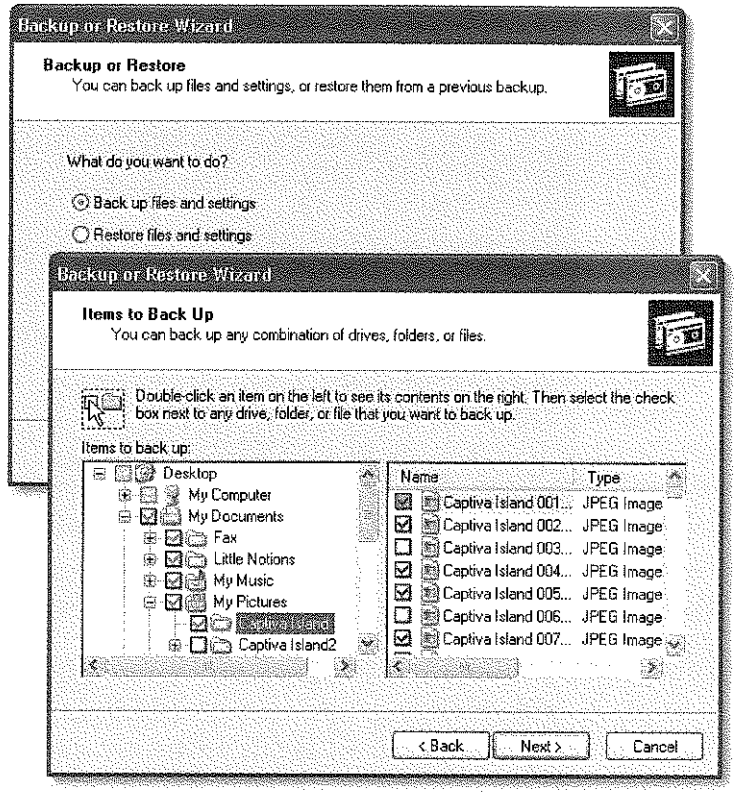


Figure 16-13:
Top left: Microsoft Backup lets you either back up or restore your files.

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.

Select the backup medium

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

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