

Chapter 1: Getting Acquainted with the Internet

In This Chapter

- ✓ Introducing the Internet
- ✓ Getting a crash course in how the Internet works
- ✓ Peeking behind the scenes of a Web page

This chapter is devoted to people who aren't sure what the Internet is and people who are sure what it is but don't know how it works. How does a Web page that was created by someone on the other side of the planet take only a second or two to arrive on your computer screen? What is a Web address, anyway? How are Web pages constructed? These and other inscrutable mysteries are unscrewed in this chapter.

What Is the Internet?

The Internet is many things to many people. Erik-Lars Nelson, a *New York Daily News* columnist, famously called it “. . . a vanity press for the demented, the conspiratorial or the merely self-important.” A newspaperman, Nelson lamented the fact that information presented on the Internet does not have to undergo a rigorous examination as to its accuracy. Whereas newspapers hold themselves to standards of truth and employ editors and fact-checkers to make sure what they print is accurate, fools can say whatever they want on the Internet — and they do so with complete confidence that somebody, somewhere will believe them.

In contrast to Nelson's dim view of the Internet, others describe the Internet in utopian terms. To these people, the Internet is a vast town meeting in which everyone can participate and everyone's voice is heard. The utopians see the Internet as a valuable tool for democracy and knowledge, a sort of international conversation for the greater good.

So what is the Internet? By the time you finish reading this book, you will decide for yourself. Meanwhile, here are some activities you can do on the Internet:

- ◆ **Research a topic:** If you know how to conduct a meaningful search, you can nearly always find the information you need on the Internet. Book II explains researching on the Internet. Figure 1-1 shows the home page of Alta Vista, a search engine.
- ◆ **Get the mail:** *E-mail*, or *electronic mail*, travels much faster than conventional mail. An e-mail message you send this instant can take as little as three seconds to reach its recipient, although you can't enclose a lock of hair or scent your e-mail message with evocative perfume. Book III explains e-mailing.
- ◆ **Connect to other researchers:** By joining newsgroups, mailing lists, and Yahoo! groups, you can get information about many different topics from other Internet researchers. Book IV looks into this subject.
- ◆ **Trade instant messages:** If you have teenagers, I bet you already know about instant messaging. Instant messaging permits a dozen or more people to gossip with one another while exercising their fingers on the keyboard. Book IV, Chapter 1 looks into instant messaging.

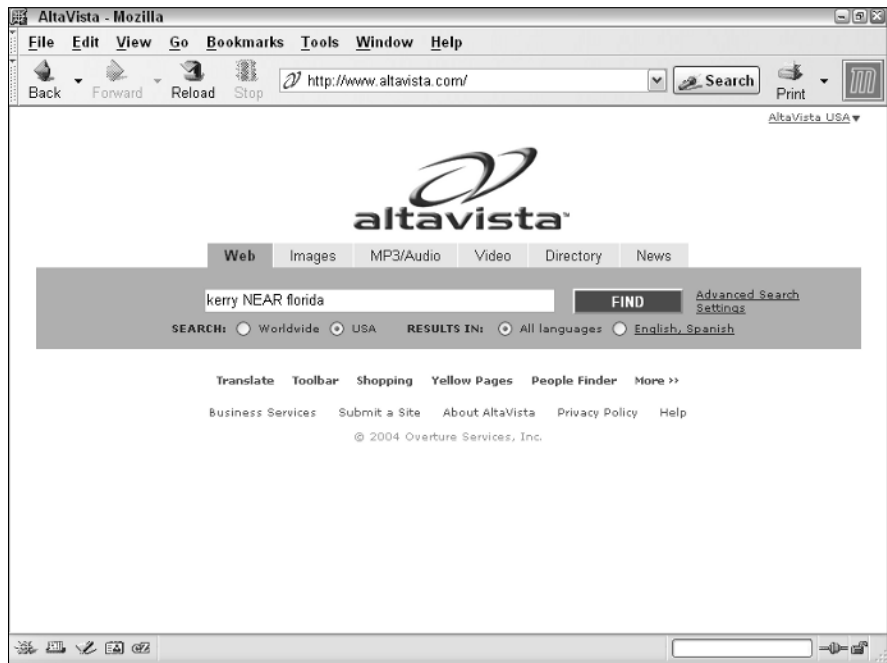


Figure 1-1:
The home
page of Alta
Vista, a
search
engine.

- ◆ **Turn your PC into a telephone:** Besides trading text messages, you can trade voice messages, and you can do it in real time such that your computer behaves like a telephone. Book IV, Chapter 9 shows how a PC can be made to act like a telephone.
- ◆ **Share your thoughts in a blog or online diary:** A *blog*, or Web log, is a journal, sometimes written anonymously, that anyone exploring the Internet can find and read. Book IV, Chapter 2 explains blogs, the latest Internet fad.
- ◆ **Join a social networking group:** You can make friends and connections online with people who share your passions and interests. Book IV, Chapter 8 explores this topic.
- ◆ **Improve your financial picture:** The Internet offers a thousand different ways to research financial opportunities, and you can also track your finances and bank online, as Book V explains.
- ◆ **Go shopping:** On the Internet, you can shop till you drop without leaving your own home. The Internet offers discount houses, auction houses, and better yet, Web sites where you can compare prices and find out whether an item is really worth buying. Book VI looks into shopping on the Internet.
- ◆ **Hold a rummage sale:** You can be a seller as well as a buyer. Selling your treasures and trinkets over the Internet is easier than you think, as you find out in Book VII.
- ◆ **Play games:** You can always find a card game on the Internet, not to mention a chess game and a poker game. Book VIII, Chapter 1 tells how to find a game for you.
- ◆ **Plan your next vacation:** For the sake of mental health, everyone needs to look forward to his or her next vacation. Book VIII, Chapter 2 explains how to plan and book ahead for your next trip to an exotic place.
- ◆ **Watch a movie:** Now that computers have more storage capacity and downloading files over the Internet is faster, you can watch movies on your computer. Just make sure that the boss doesn't see you do it. Book VIII, Chapter 3 shows how to temporarily turn your computer into a movie theater.
- ◆ **Turn your computer into a jukebox:** Downloading songs from the Internet is easier than ever, as Book VIII, Chapter 5 explains.
- ◆ **Trace your genealogy:** You can find many online databases with information about the dead, and many of them are free to explore. See Book VIII, Chapter 6.

How the Internet Works

In my experience, there are two kinds of people: the curious, who look under the hood of the car to figure out how the car runs, and the others, whose blind faith in machinery makes them indifferent. Even if you fall in the second category, knowing a little about the workings of the Internet is worthwhile. Someday you may decide to create a Web site. Or, you may wonder why your Internet connection isn't working. In times like those, it pays to know something about the Internet.

These pages explain in simple terms how the Internet works. And to help you understand the workings of the Internet, I start with a history lesson.

A mercifully brief history of the Internet

Most historians trace the beginning of the Internet to Sputnik, the first satellite to successfully orbit the earth. After Russia launched Sputnik in 1957, the United States embarked on an ambitious national project to bridge what was called the “technology gap” and catch up to the Russians in science and technology. As part of that effort, the Department of Defense established the Advanced Research Projects Agency, or ARPA, in 1958. The agency's job was to oversee the research and development of new technology for military use.

ARPA employed scientists and engineers in universities and laboratories throughout the United States. These scientists and engineers needed a way to exchange information and collaborate with one another. To this end, ARPA developed the first computer network, called ARPANET, in 1969. The network permitted researchers throughout the United States to dial in to and access four host computers — three in California and one in Utah — over the telephone lines.



To speed the transmission of data, ARPANET employed a novel means of sending information over the telephone lines called *packet switching*. Instead of data being sent in a continuous stream, it was divided into smaller units called *packets* and sent all at once over available telephone lines. Arriving at their destination, the packets were recompiled — in other words, the data were reassembled so that it could be read or interpreted. Like ARPANET, the Internet is a packet-switching network. Packet switching makes it possible for data to travel very quickly, because the packets can arrive out of order, withstand delays in transmission, and travel by many different routes to their destination. By the strictest definition, the Internet is simply a packet-delivery system. It can deliver information packets anywhere in the world in less than a second.

ARPANET was the forerunner of the Internet. In ARPANET, data did not pass through a central hub; instead, all the host computers were connected to all the other host computers. This revolutionary decentralized design permitted data to take many different routes from one computer to another because the computers were interconnected. And if one part of the network failed, the network's interconnectedness made it possible for other parts to pick up the slack and continue transmitting data by a different route. Moreover, the decentralized structure of ARPANET made it easier to add computers to the network.

In the beginning, only four host computers — computers that other computers can connect to, similar to what we call Web servers — were available on ARPANET, but universities and research centers soon understood the value of being able to collaborate over a network, and more host computers were added. By 1971, there were 23 host computers on ARPANET. In 1972, e-mail was invented so that researchers could quickly exchange messages, and network traffic increased dramatically. In 1977, ARPANET featured 111 host computers. By 1989, ARPANET had become a “network of networks,” with some 100,000 host computers.

ARPANET had turned into the Gargantua that we call the Internet. ARPANET's designers envisioned an interconnected network with no central authority to which new networks could be added. ARPANET succeeded beyond its designers' wildest dreams. Estimates of how many people worldwide use the Internet range from 600 to 730 million. In 2001, for the first time, the number of hours that Americans watch television shrank because the Internet had become an alternative to television watching. Today, no single organization controls the Internet. Each organization with a host computer is responsible for maintaining its part of the Internet so that data packets can speed merrily along to their destinations.



The Open Directory Project, a Web directory maintained by volunteers, offers a Web page with links where you can get statistics about Internet use. The Web page is located at this address: http://dmoz.org/Computers/Internet/Statistics_and_Demographics.

The World Wide Web

The early Internet was strictly for academics and researchers. To retrieve documents, you had to know advanced programming commands. You had to remember arcane numerical Internet addresses. Each host computer had a different command set for accessing files.



Starting in the late 1980s, however, innovations in computer science made the Internet available to everyone. In 1989, a protocol called *http*, or *hypertext transfer protocol*, made it easy to transfer files over the Internet. In computer terminology, a *protocol* is set of rules by which computers communicate with one another. You no longer had to learn a different set of commands to transfer a file from a host computer to your computer because each host computer stuck to the *http* standard. The letters *http* at the start of Web addresses refer to the hypertext transfer protocol (see Figure 1-2).

The late 1980s also saw the invention of the World Wide Web, also known simply as “the Web.” The letters *www* in Web addresses stand for World Wide Web (refer to Figure 1-2). The man who coined this term, a computer scientist named Tim Berners-Lee, called the Web “the universe of network-accessible information, an embodiment of human knowledge.” Berners-Lee was one of those utopians I mention at the start of this chapter. In prosaic terms, the World Wide Web is just the sum of all the files — the Web pages, audio files, movie files, and computer programs — that you can bring into your computer from the Internet by way of the hypertext transfer protocol.

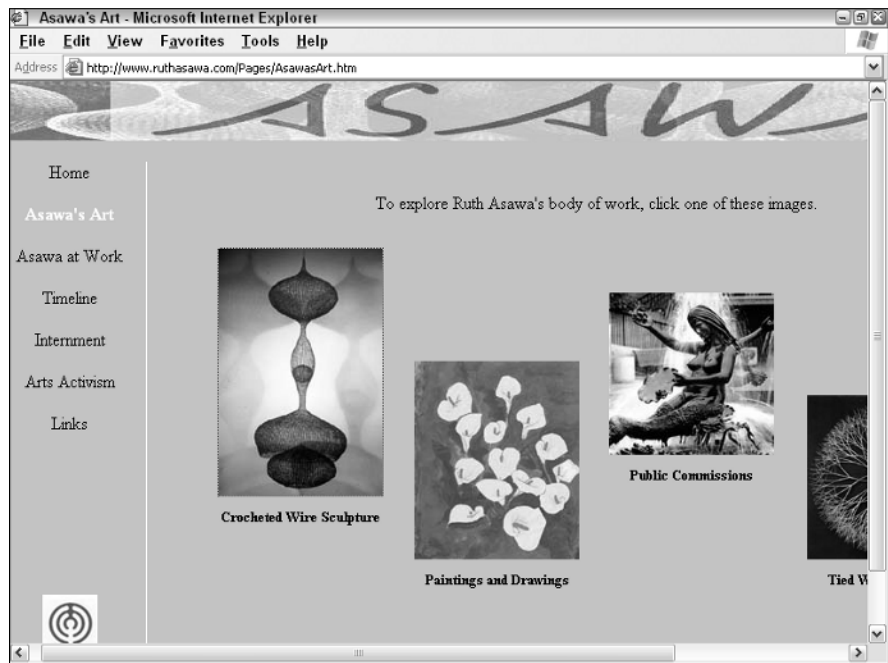


Figure 1-2:
Ever wondered what a Web address is all about?

Web addresses

Besides inventing the term *World Wide Web*, Tim Berners-Lee invented the addressing system for locating files on the Web. Previous to this system, you had to enter a hard-to-remember IP address number to visit a Web site, but the system replaced numbers with descriptive domain names. In the system, file addresses are designated by a domain name and then by a folder name within the domain. To see how Web addresses work, consider the address of the Web page shown in Figure 1-2:

`http://www.ruthasawa.com/Pages/AsawasArt.htm`

A computer reads this address like so:

- ◆ `http://`: The file at this address can be transferred using the hypertext transfer protocol.
- ◆ `www`: The file is located on the World Wide Web.
- ◆ `ruthasawa.com`: The domain name of the Web site to connect to is `ruthasawa.com`. The next section in this chapter explains what domain names are and how computers use them to locate computers on the Internet. The `.com` ending on the domain name tells you that the site is commercial (for-profit) in nature.
- ◆ `/Pages`: Within the `ruthasawa.com` Web site, the file is found in a folder called `Pages`. Files on Web sites are stored in folders, just as files are stored in folders on your computer.
- ◆ `/AsawasArt.htm`: The file to be transferred is called `AsawasArt.htm`. The `.htm` file extension means that the file is written in hypertext markup language.

The addressing convention that Tim Berners-Lee invented made it possible for computers to quickly locate and download files from the World Wide Web. His addressing convention also made the Web more weblike. Now that everyone agreed on how to address Web pages, linking Web pages became much easier. Hyperlinks began appearing on Web pages. For the first time, you could point to and click a hyperlink on one Web page and go straight to another page. (By the way, Berners-Lee called Web addresses *uniform resource locators*, or URLs, a term that is thankfully falling out of favor. I only mention URLs here in case someone mentions them to you and you want to nod your head wisely because you know what URLs are. In this book, I refer to URLs as Web addresses.)

More computer science innovations brought the Internet even closer to home. Faster modems decreased the amount of time you had to wait for Web pages to arrive on your computer. In the early 1990s, the first Web browser, Mosaic, appeared. Now a program made especially for exploring the Internet was available. Also in the mid-1990s, the Java computer language made it possible to incorporate video and sound on Web pages. And don't forget the mouse! All hail the mouse! Where would we be without it? You can explore the Internet for hours at a time without touching the keyboard thanks to this furry little animal. And it's amazing that the mouse didn't become a computer apparatus on Macs until 1986 and on PCs until 1987.

IP addresses

Every computer that's connected to the Internet has an *Internet Protocol address*, better known as an *IP address*. Computers use these addresses to locate data and to send data over the Internet.

Want to know your computer's IP address?

Follow these steps to find out your computer's IP address:

- 1. Choose Start→Programs→Accessories→Command Prompt (choose MS-DOS instead of Command Prompt if you are running Windows 98 or Windows Me).**

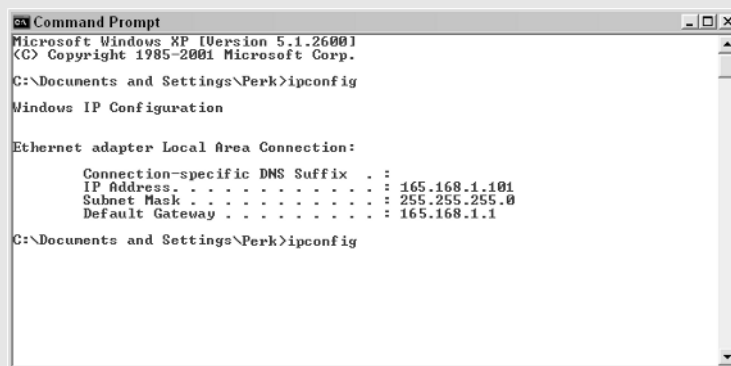
The Command Prompt window opens.

- 2. Enter ipconfig and press Enter.**

The window shows you information about your computer, including its IP address.

Here's an even faster way to find out your IP address. Open your Web browser, enter this address in the Address bar, and press Enter:

www.whatismyip.com



```
ex Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\Perk>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address . . . . . : 165.168.1.101
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 165.168.1.1

C:\Documents and Settings\Perk>ipconfig
```


If yours is a DSL Internet connection or cable modem connection, your IP address is permanent and unchanging. If yours is a dialup Internet connection, your Internet provider assigns you a new IP address each time you connect to the Internet.

An IP address is a 32-bit (4-byte) binary number, which needn't concern you very much. The point is that the number identifies a computer on the Internet. Here is an example of an IP address:

216.239.39.99

Each domain name — `google.com`, `yahoo.com`, and `microsoft.com`, for example — is assigned an IP address. The IP address just listed, for example, belongs to the domain name `google.com`. When you enter a Web address in your browser to view a Web page, your computer takes note of the domain name part of the address (`google.com`, `yahoo.com`, or `microsoft.com`, for example) and sends a query to a *domain name server* asking for the IP address that's assigned to the domain name. The domain name server, in turn, sends the IP address of the domain name back to your computer. Your computer then sends a request for Web-page files from the IP address in question, and in less than a second, if you have a fast Internet connection, a Web page appears on your computer screen.

Something similar happens when you send an e-mail message. Your computer sends a query asking for the IP address of the domain name, the part of the e-mail address after the at (@) symbol. When the IP number is returned, the e-mail message is sent.

To see how IP addresses work, try this simple exercise:

1. Open your Web browser.

2. In the Address bar, type `www.google.com` and press Enter.

Your browser opens to the Google home page, as shown at the top of Figure 1-3.

3. Delete the `www.google.com` in the Address bar and enter the following:

216.239.39.99

4. Press Enter.

You see the Google home page again, as shown at the bottom of Figure 1-3, because the number you entered in Step 3 is the IP address of `google.com`.

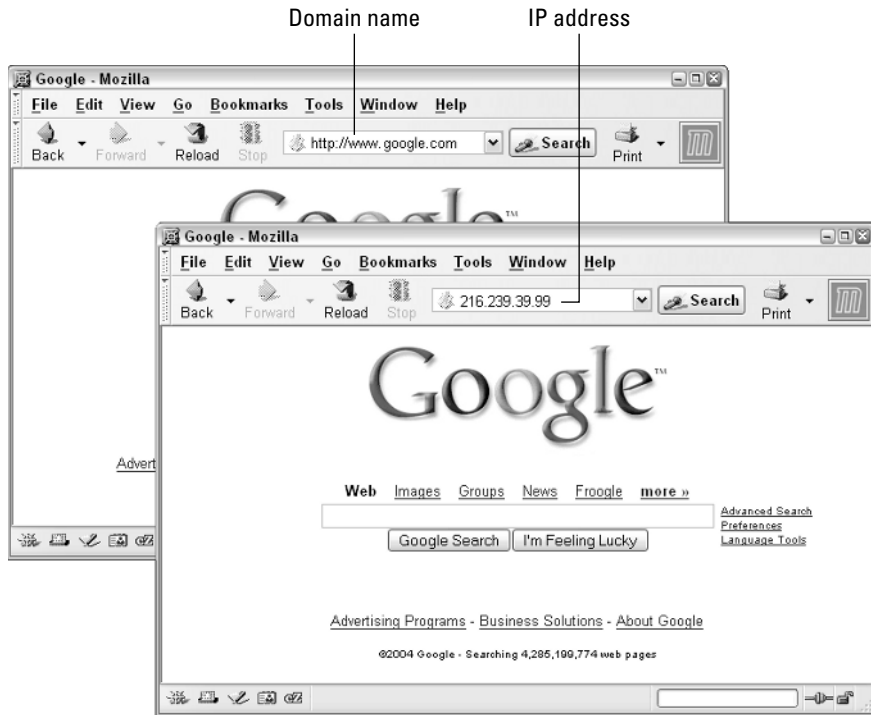


Figure 1-3: Normally, your computer enters the IP address for you.

In the old days, before the domain-name addressing system for locating files on the Web, you had to enter IP addresses. Aren't you glad you don't live in the old days? Entering descriptive Web addresses sure beats entering 32-bit binary numbers.

Finding a Web site's IP address

If you are called on to play Internet detective and find the IP address of a Web site, you can follow these steps to find it:

1. Choose Start→Programs→Accessories→Command Prompt.

If you are running the Windows 98 or Windows Me operating system, choose MS-DOS instead of Command Prompt. You see the Command Prompt window.

2. Enter ping and a blank space.

3. Enter the domain name of the Web site whose IP address you need.

For example, to find the IP address of `google.com`, enter **google.com**, as shown in Figure 1-4.

4. Press Enter.

The Command Prompt window tells you the Web site's IP address (refer to Figure 1-4). Notice the “approximate round trip times in milli-seconds” in the Command Prompt window. It took my computer only 76 milliseconds to ask for and receive the IP address of `google.com`. That's less than a tenth of a second. Information travels fast on the Internet.

```

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Perk>ping google.com

Pinging google.com [216.239.37.99] with 32 bytes of data:

Reply from 216.239.37.99: bytes=32 time=77ms TTL=237
Reply from 216.239.37.99: bytes=32 time=77ms TTL=237
Reply from 216.239.37.99: bytes=32 time=76ms TTL=237

Ping statistics for 216.239.37.99:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 76ms, Maximum = 77ms, Average = 76ms

C:\Documents and Settings\Perk>

```

Figure 1-4:
You can
“ping” to
find IP
addresses
on the
Internet.

How Web Pages Work

If a friend tells you to go to the such-and-such Web page because it is entertaining, thought provoking, or funny, and you go there, you aren't really going anywhere. Really, the Web page is coming to you. The files with which the Web page is composed come to your computer so that you can view them.

All but the simplest Web page consists of many different files — text files, graphic files, and sometimes animation, video, and sound files. To see what I mean, take a look at Figure 1-5, a Web page from `amazon.com`. The top half of the figure shows the Web page without the graphic images; in the bottom half of the figure, you can see where the graphic image files have been plugged into the Web page. This Web page consists of a dozen or more files.

When you bring a Web page like this to your computer, the image files tag along behind the Web page. Hypertext markup language in the Web page tells your Web browser where to plug in each tag-along file, and the result is a full-fledged Web page.

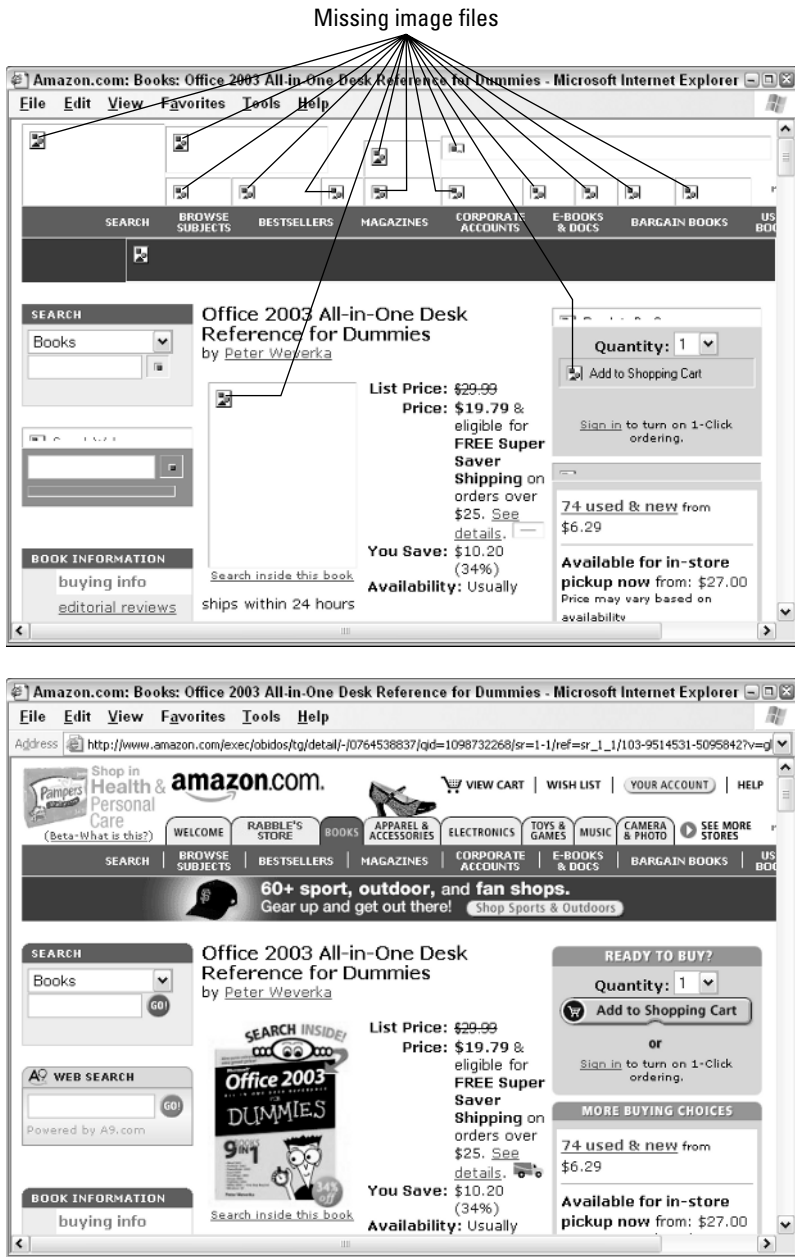


Figure 1-5: Most Web pages consist of many different files.

Web pages are written in *hypertext markup language*, or HTML, the computer language that tells the Web browser how to lay out and construct Web pages from the different files with which they are made. Want to see something scary? In your browser, choose View⇨Source (in Internet Explorer) or View⇨Page Source (in Mozilla) to see the HTML codes with which a Web page is constructed. Figure 1-6 shows some of the HTML code used to construct part of the page shown in Figure 1-5.

These codes are scary, but don't be discouraged if you want to create a Web site of your own. Thanks to the miracle of modern computer science, you can create Web pages and Web sites without having to know or write HTML codes, as Book IV, Chapter 7 explains. Keep your chin up. All is not lost.

Figure 1-6:
HTML
codes for
the Web
page shown
in Figure 1-5.

```

103-9514531-5095842[1]. Notepad
File Edit Format View Help
<a
href=/exec/obidos/subst/home/home.html/ref%3Dtab%25Fb%25Fgw%25F1/103-95145
31-5095842><a
href=/exec/obidos/tg/stores/your/store-home/-/0/ref%3Dpd%25Fy1%25Fb%25Ffr
%25F2/103-9514531-5095842><a
href=/exec/obidos/tg/browse/-/283155/ref%3Dtab%25Fb%25Fb%25F3/103-9514531-
5095842></a></nobr></td><td colspan=2></nobr><a
href=/exec/obidos/tg/browse/-/1036592/ref%3Dtab%25Fb%25Fap%25F4/103-951453
1-5095842><a
href=/exec/obidos/tg/browse/-/172282/ref%3Dtab%25Fb%25Fe%25F5/103-9514531-
5095842><img
src="http://g-inages.amazon.com/inages/G/01/nav/personalized/tabs/elect

```

