Chapter Two

The Internet and World Wide Web
Objectives

After completing this chapter, you will be able to:

1. Discuss the evolution of the Internet
2. Identify and briefly describe various broadband Internet connections and state differences between broadband Internet connections and dial-up connections
3. Describe the types of Internet access providers: Internet service providers, online service providers, wireless Internet service providers
4. Describe the purpose of an IP address and its relationship to a domain name
5. Explain the purpose of a Web browser and identify the components of a Web address
6. Describe how to use a search engine to search for information on the Web and differentiate between a search engine and a subject directory
7. Describe the types of Web sites: portal, news, informational, business/marketing, blog, wiki, online social network, educational, entertainment, advocacy, Web application, content aggregator, and personal
8. Explain how Web pages use graphics, animation, audio, video, virtual reality, and plug-ins
9. Identify and briefly describe the steps required for Web publishing
10. Describe the types of e-commerce: business-to-consumer, consumer-to-consumer, and business-to-business
11. Explain how e-mail, mailing lists, instant messaging, chat rooms, VoIP, newsgroups and message boards, and FTP work
12. Identify the rules of netiquette
Chapter 2  The Internet and World Wide Web

The Internet

One of the major reasons business, home, and other users purchase computers is for Internet access. The Internet is a widely used research tool, providing society with access to global information and instant communications. Further, access to the Internet can occur anytime from a computer anywhere: at home, at work, at school, in a restaurant, on an airplane, and at a park.

The Internet, also called the Net, is a worldwide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals. Each of the networks on the Internet provides resources that add to the abundance of goods, services, and information accessible via the Internet.

Today, more than one billion home and business users around the world access a variety of services on the Internet, some of which are shown in Figure 2-1. The World Wide Web, or simply the Web, and e-mail are two of the more widely used Internet services. Other services include chat rooms, instant messaging, and VoIP (Voice over Internet Protocol). To enhance your understanding of these Internet services, the chapter begins by discussing the history of the Internet and how the Internet works and then explains each of these services.

Figure 2-1  People around the world use a variety of Internet services in daily activities. Internet services allow home and business users to access the Web for activities such as conducting research, reading blogs, or sharing videos; to send e-mail messages; or to converse with others using chat rooms, instant messaging, or VoIP.
Evolution of the Internet

The Internet has its roots in a networking project started by the Pentagon’s Advanced Research Projects Agency (ARPA), an agency of the U.S. Department of Defense. ARPA’s goal was to build a network that (1) allowed scientists at different physical locations to share information and work together on military and scientific projects and (2) could function even if part of the network were disabled or destroyed by a disaster such as a nuclear attack. That network, called ARPANET, became functional in September 1969, linking scientific and academic researchers across the United States.

The original ARPANET consisted of four main computers, one each located at the University of California at Los Angeles, the University of California at Santa Barbara, the Stanford Research Institute, and the University of Utah. Each of these computers served as a host on the network. A host, more commonly known today as a server, is any computer that provides services and connections to other computers on a network. Hosts often use high-speed communications to transfer data and messages over a network.

As researchers and others realized the great benefit of using ARPANET to share data and information, ARPANET underwent phenomenal growth. By 1984, ARPANET had more than 1,000 individual computers linked as hosts. Today, more than 550 million hosts connect to the Internet.

Some organizations connected entire networks to ARPANET to take advantage of its high-speed communications. In 1986, the National Science Foundation (NSF) connected its huge network of five supercomputer centers, called NSFnet, to ARPANET. This configuration of complex networks and hosts became known as the Internet.
Until 1995, NSFnet handled the bulk of the communications activity, or traffic, on the Internet. In 1995, NSFnet terminated its network on the Internet and resumed its status as a research network.

Today, the Internet consists of many local, regional, national, and international networks. Numerous corporations, commercial firms, and other companies such as IBM provide networks to handle Internet traffic. Both public and private organizations own networks on the Internet. These networks, along with telephone companies such as Verizon and AT&T, cable and satellite companies, and the government, all contribute toward the internal structure of the Internet.

Each organization on the Internet is responsible only for maintaining its own network. No single person, company, institution, or government agency controls or owns the Internet. The World Wide Web Consortium (W3C), however, oversees research and sets standards and guidelines for many areas of the Internet. The mission of the W3C is to contribute to the growth of the Web. More than 350 organizations from around the world are members of the W3C, advising, defining standards, and addressing other issues.

Internet2

Internet2 is a not-for-profit research and development project that connects more than 200 universities and 115 companies via a high-speed private network. Founded in 1996, the goal of Internet2 is to develop and test advanced network technologies that will benefit Internet users in the short-term future. These technologies require an extremely high-speed network that exceeds the capabilities of today’s Internet and networks. Examples of previous Internet2 projects that are now mainstream include telemedicine, digital libraries (online books, magazines, music, movies, speeches, etc.), and faster Internet services. Current Internet2 projects include interactive high-definition video and enhanced detection and resolution of network problems.

Connecting to the Internet

Many home and small business users connect to the Internet via high-speed broadband Internet service. With broadband Internet service, your computer or mobile device usually is connected to the Internet the entire time it is powered on. Examples of broadband Internet service include cable, DSL, fiber, radio signals, and satellite.

- **Cable Internet service** provides high-speed Internet access through the cable television network via a cable modem.

- **DSL** (digital subscriber line) provides high-speed Internet connections using regular copper telephone lines.

- **Fiber to the Premises (FTTP)** uses fiber-optic cable to provide high-speed Internet access to home and business users.

- **Fixed wireless** provides high-speed Internet connections using a dish-shaped antenna on your house or business to communicate with a tower location via radio signals.

- A **cellular radio network** offers high-speed Internet connections to devices with built-in compatible technology or computers with wireless modems.

- A **Wi-Fi** (wireless fidelity) network uses radio signals to provide high-speed Internet connections to compatible or properly equipped wireless computers and devices.

- **Satellite Internet service** provides high-speed Internet connections via satellite to a satellite dish that communicates with a satellite modem.

Employees and students typically connect their computers to the Internet through a business or school network. The business or school network connects to a high-speed broadband Internet service.

Many home users set up a Wi-Fi network, which sends signals to a communications device that is connected to a high-speed Internet service such as cable or DSL. Instead of using broadband Internet service, however, some home users connect to the Internet via dial-up access, which is a slower-speed technology. **Dial-up access** takes place when the modem in your computer connects to the Internet via a standard telephone line that transmits data and information using an analog (continuous wave pattern) signal. Users may opt for dial-up access because of its lower price or because broadband access is not available in their area.

Mobile users access the Internet using a variety of Internet services. Most hotels and airports provide wired or wireless Internet connections as a service to travelers. Wireless Internet services, such as Wi-Fi networks, allow mobile users to connect easily to the Internet with notebook computers, smart phones, and other mobile devices while away from a telephone, cable, or other wired connection. Many public locations, such as airports, hotels, schools, shopping malls, and coffee shops, are **hot spots** that provide Wi-Fi Internet connections to users with mobile computers or devices. At public locations, you may be required to agree to terms of service, obtain a password (for example, from the hotel's front desk), or perform some other action in order to connect to the Internet. Some cities provide free Wi-Fi Internet connections to all residents.
Access Providers

An access provider is a business that provides individuals and organizations access to the Internet free or for a fee. For example, some

Wi-Fi networks provide free access while others charge a per use fee. Other access providers often charge a fixed amount for an Internet connection, offering faster speeds or more services for higher rates. Typical monthly rates range from about $5 to $24 per month for dial-up, $13 to $70 for DSL, $20 to $75 for cable, $40 to $150 for FTTP, $30 to $80 for fixed wireless, $60 to $80 for cellular networks, and $50 to $120 for satellite. Many Internet access providers offer services such as news, weather, financial data, games, travel guides, e-mail, photo communities, and online storage to hold digital photos and other files. (A file is a named unit of storage.)

Access providers are categorized as regional or national ISPs, online service providers, and wireless Internet service providers (Figure 2-2).

FAQ 2-1

How popular is broadband?

According to a study performed by Pew Internet & American Life Project, 63 percent of American adults have broadband Internet connections at home. Adoption of broadband connections increases during good economic times, while some may hesitate to make the switch during an economic downturn. It is believed that once the price of a broadband connection decreases, and broadband is available in more rural areas, its popularity will increase further.

For more information, visit scsite.com/dc2011/ch2/faq and then click Broadband.

Figure 2-2

Common ways to access the Internet are through a regional or national Internet service provider, an online service provider, or a wireless Internet service provider.
An ISP (Internet service provider) is a regional or national access provider. A regional ISP usually provides Internet access to a specific geographic area. A national ISP is a business that provides Internet access in cities and towns nationwide. For dial-up access, some national ISPs provide both local and toll-free telephone numbers. Due to their larger size, national ISPs usually offer more services and have a larger technical support staff than regional ISPs. Examples of national ISPs are AT&T and EarthLink.

In addition to providing Internet access, an online service provider (OSP) also has many members-only features such as instant messaging or their own customized version of a Web browser. The two more popular OSPs are AOL (America Online) and MSN (Microsoft Network). AOL differs from many OSPs in that it provides gateway functionality to the Internet, meaning it regulates the Internet services to which members have access. AOL also provides free access to its services to any user with a broadband Internet connection.

When selecting an ISP or OSP for dial-up access, ensure it provides at least one local telephone number. Otherwise, long-distance telephone charges will apply for the time you connect to the Internet.

A wireless Internet service provider, sometimes called a wireless data provider, is a company that provides wireless Internet access to desktop and notebook computers and mobile devices, such as smart phones and portable media players, with built-in wireless capability (such as Wi-Fi) or to computers using wireless modems or wireless access devices. Wireless modems, which usually are in the form of a USB flash drive or a card that inserts in a slot in a computer or mobile device, generally dial a telephone number to establish a connection with the wireless Internet service provider. An antenna on or built into the computer or device, wireless modem, or wireless access device typically sends signals through the airwaves to communicate with a wireless Internet service provider. Some examples of wireless Internet service providers include AT&T, Boingo Wireless, Sprint Broadband Direct, T-Mobile, and Verizon Wireless.

How Data and Information Travel the Internet

Computers connected to the Internet work together to transfer data and information around the world using servers and clients and various wired and wireless transmission media. On the Internet, your computer is a client that can access data, information, and services on a variety of servers.

The inner structure of the Internet works much like a transportation system. Just as interstate highways connect major cities and carry the bulk of the automotive traffic across the country, several main transmission media carry the heaviest amount of traffic on the Internet. These major carriers of network traffic are known collectively as the Internet backbone.

In the United States, the transmission media that make up the Internet backbone exchange data and information at several different major cities across the country. That is, they transfer data and information from one network to another until reaching the final destination (Figure 2-3).
The Internet relies on an addressing system much like the postal service to send data and information to a computer at a specific destination. An **IP address**, short for Internet Protocol address, is a number that uniquely identifies each computer or device connected to the Internet. The IP address usually consists of four groups of numbers, each separated by a period. The number in each group is between 0 and 255. For example, the numbers 72.14.207.99 are an IP address. In general, the first portion of each IP address identifies the network and the last portion identifies the specific computer.

These all-numeric IP addresses are difficult to remember and use. Thus, the Internet supports the use of a text name that represents one or more IP addresses. A **domain name** is the text version of an IP address. Figure 2-4 shows an IP address and its associated domain name. As with an IP address, the components of a domain name are separated by periods.

The text in the domain name up to the first period identifies the type of Internet server. In Figure 2-4, for example, the www indicates a Web server.

**Internet Addresses**

**Figure 2-4** The IP address and domain name for the Google Web site.
Every domain name contains a *top-level domain* (TLD), which is the last section of the domain name. A generic TLD (gTLD), such as the com in Figure 2-4 on the previous page, identifies the type of organization associated with the domain. The Internet server and gTLD portions of a domain name often are not required.

The organization that assigns and controls top-level domains is the Internet Corporation for Assigned Names and Numbers (ICANN pronounced EYE-can). Figure 2-5 lists some gTLDs. For TLDs such as biz, com, info, name, net, and org, you register for a domain name from a registrar, which is an organization that sells and manages domain names.

For international Web sites outside the United States, the domain name also includes a country code TLD (ccTLD), which is a two-letter country code, such as au for Australia. For example, www.philips.com.au is the domain name for Philips Australia. Some smaller countries have granted use of their ccTLDs for commercial purposes, such as tv (Tuvalu) for the television/entertainment industry.

The domain name system (DNS) is the method that the Internet uses to store domain names and their corresponding IP addresses. When you specify a domain name, a DNS server translates the domain name to its associated IP address so that data and information can be routed to the correct computer. A DNS server is an Internet server that usually is associated with an Internet access provider. For a more technical discussion about DNS servers, read the High-Tech Talk article on page 382.

The growth of the Internet has led to a shortage of IP addresses. Thus, a new IP addressing scheme, called IPv6, may increase the number of available IP addresses. For a more technical discussion about Internet addresses and IPv6, read the High-Tech Talk article on page 110.

### The World Wide Web

Although many people use the terms World Wide Web and Internet interchangeably, the World Wide Web actually is a service of the Internet. While the Internet was developed in the late 1960s, the World Wide Web emerged in the early 1990s. Since then, it has grown phenomenally to become one of the more widely used Internet services.

The *World Wide Web* (WWW), or Web, consists of a worldwide collection of electronic documents. Each electronic document on the Web is called a *Web page*, which can contain text, graphics, animation, audio, and video. Additionally, Web pages usually have built-in connections to other documents.
Some Web pages are static (fixed); others are dynamic (changing). Visitors to a static Web page all see the same content. With a dynamic Web page, by contrast, visitors can customize some or all of the viewed content such as desired stock quotes, weather for a region, or ticket availability for flights.

A Web site is a collection of related Web pages and associated items, such as documents and pictures, stored on a Web server. A Web server is a computer that delivers requested Web pages to your computer. The same Web server can store multiple Web sites. Some industry experts use the term Web 2.0 to refer to Web sites that provide a means for users to share personal information (such as social networking Web sites), allow users to modify Web site content (such as wikis, which are discussed later in this chapter), and have application software built into the site for visitors to use (such as e-mail and word processing programs). Read Looking Ahead 2-1 for a look at Web 3.0.

Browsing the Web

A Web browser, or browser, is application software that allows users to access and view Web pages or access Web 2.0 programs. To browse the Web, you need a computer or mobile device that is connected to the Internet and has a Web browser. The more widely used Web browsers for personal computers are Internet Explorer, Firefox, Opera, Safari, and Google Chrome.

With an Internet connection established, you start a Web browser. The browser retrieves and displays a starting Web page, sometimes called the browser’s home page (Figure 2-6). The initial home

### How a Web Browser Displays a Home Page

#### Step 1
Start the Web browser software by clicking the Web browser icon on the taskbar or typing the Web browser name in the search box on the Start menu.

#### Step 2
Behind the scenes, the Web browser looks up its home page setting. For illustration purposes only, the screen on the right shows the home page setting is msn.com.

#### Step 3
The Web browser communicates with a server maintained by your Internet access provider. The server translates the domain name of the home page to an IP address and then sends the IP address to your computer.

#### Step 4
The Web browser uses the IP address to contact the Web server associated with the home page and then requests the home page from the server. The Web server sends the home page to the Web browser, which formats the page for display on your screen.

Figure 2-6 This figure shows how a Web browser displays a home page.
page that is displayed is one selected by your Web browser. You can change your browser’s home page at anytime.

Another use of the term, home page, refers to the first page that a Web site displays. Similar to a book cover or a table of contents for a Web site, the home page provides information about the Web site’s purpose and content. Many Web sites, such as iGoogle, allow you to personalize the home page so that it contains areas of interest to you. The home page usually contains links to other documents, Web pages, or Web sites. A link, short for hyperlink, is a built-in connection to another related Web page or part of a Web page.

Internet-enabled mobile devices such as smart phones use a special type of browser, called a microbrowser, which is designed for their small screens and limited computing power. Many Web sites design Web pages specifically for display on a microbrowser (Figure 2-7).

For a computer or mobile device to display a Web page, the page must be downloaded. Downloading is the process of a computer or device receiving information, such as a Web page, from a server on the Internet. While a browser downloads a Web page, it typically displays an animated logo or icon in the browser window. The animation stops when the download is complete. The time required to download a Web page varies depending on the speed of your Internet connection and the amount of graphics involved.

FAQ 2-3

Which Web browser currently has the highest market share?

Windows Internet Explorer (IE) currently is the most popular browser, with approximately 68 percent of the market share. The chart below illustrates the market share of the more popular Web browsers.

![Market Share Chart]

For more information, visit scsite.com/dc2011/ch2/faq and then click Browser Market Share.

Web Addresses

A Web page has a unique address, called a URL (Uniform Resource Locator) or Web address. For example, the home page for the United States National Park Service Web site has http://www.nps.gov as its Web address. A Web browser retrieves a Web page using its Web address.

If you know the Web address of a Web page, you can type it in the Address bar at the top of the browser window. For example, if you type the Web address http://www.nps.gov/grsm/planyourvisit/wildlifeviewing.htm in the Address bar and then press the ENTER key, the browser downloads and displays the Web page shown in Figure 2-8.

A Web address consists of a protocol, domain name, and sometimes the path to a specific Web page or location on a Web page. Many Web page addresses begin with http://. The http, which stands for Hypertext Transfer Protocol, is a set of rules that defines how pages transfer on the Internet.

To help minimize errors, many browsers and Web sites do not require you enter the http:// and www portions of the Web address in the Address bar. If you enter an incorrect Web address, the browser may display a list of similar addresses or related Web sites from which you can select.
When you enter the Web address, http://www.nps.gov/grsm/planyourvisit/wildlifeviewing.htm in the Web browser, it sends a request to the Web server that contains the nps.gov Web site. The server then retrieves the Web page named wildlifeviewing.htm that is located in the grsm/planyourvisit path and delivers it to your browser, which then displays the Web page on the screen.

To save time, many users create bookmarks for their frequently visited Web pages. A bookmark, or favorite, is a saved Web address that you access by clicking its name in a list. That is, instead of entering a Web address to display a Web page, you can click a previously saved bookmark.

When you enter a Web address in a browser, you request, or pull, information from a Web server. Some Web servers also can push content to your computer at regular intervals or whenever updates are made to the site. For example, some Web servers provide the capability of displaying current sporting event scores or weather reports on your computer screen.

For information about useful Web sites and their associated Web addresses, read the Making Use of the Web feature that follows this chapter.

**Navigating Web Pages**

Most Web pages contain hypertext or hypermedia links. Hypertext refers to links in text-based documents, whereas hypermedia combines text-based links with graphic, audio, and video links. Links allow you to obtain information in a nonlinear way. That is, instead of accessing topics in a specified order, you move directly to a topic of interest. Branching from one related topic to another in a nonlinear fashion is what makes links so powerful. Some people use the phrase, surfing the Web, to refer to the activity of using links to explore the Web.

![Diagram of a URL structure](http://www.nps.gov/grsm/planyourvisit/wildlifeviewing.htm)

**Figure 2-8** After entering http://www.nps.gov/grsm/planyourvisit/wildlifeviewing.htm as the Web address in the Address bar, this Web page at the United States National Park Service Web site is displayed.
A link can be text or an image. Text links may be underlined and/or displayed in a color different from other text on the Web page. Pointing to, or positioning the pointer on, a link on the screen typically changes the shape of the pointer to a small hand with a pointing index finger. Pointing to a link also sometimes causes the link to change in appearance or play a sound. For example, an underline may disappear, the text may change color, the image may change, etc. The Web page shown in Figure 2-9 contains a variety of link types, with the pointer on one of the links.

Each link on a Web page corresponds to a Web address or a document. To activate a link, you click it, that is, point to the link and then press the left mouse button. Clicking a link causes the Web page or document associated with the link to be displayed on the screen. The linked object might be on the same Web page, a different Web page at the same Web site, or a separate Web page at a different Web site in another city or country. To remind you visually that you have clicked a link, a text link often changes color after you click it.

Most current Web browsers support tabbed browsing, where the top of the browser displays a tab (similar to a file folder tab) for each Web page you open (shown in Figure 2-9). To move from one open Web page to another, you click the tab in the Web browser. Tabbed browsing allows users to have multiple home pages that automatically open when the browser starts. You also can organize tabs in a group, called a tab group, and save the group as a favorite, so that at any time you can display all tabs at once.

Because some Web sites attempt to track your browsing habits or gather personal information, some current Web browsers include a feature that allows you to disable and/or more tightly control the dissemination of your browsing habits and personal information. Read Ethics & Issues 2-1 for a related discussion.

**ETHICS & ISSUES 2-1**

Should the Government Allow You to Sign Up for a Do-Not-Track List?

When you visit a Web site that includes an advertisement, someone probably is recording the fact that you visited that Web site and viewed the advertisement with your browser. Over time, companies that specialize in tracking who views which online advertisements can amass an enormous amount of information about your online Web surfing habits. Through tracking the Web sites a user visits, the products they buy, and the articles they read, a company may attempt to profile the visitor’s beliefs, associations, and habits. Although a user may think he or she is anonymous while navigating the Web, the company can attempt through various means to link the user’s true identity with the user’s online profile. The company can sell online profiles, with or without the user’s true identity, to other advertisers or organizations. Some privacy groups have called for the government to allow consumers to sign up for a do-not-track list modeled after the popular do-not-call list.

Should organizations be allowed to track your Web surfing habits? Why or why not? Should organizations be allowed to associate your real identity with your online identity and profit from the information? Should the government force companies to give you the option of not being tracked? Why or why not? What are the benefits and dangers of online tracking?
The Web is a worldwide resource of information. A primary reason that people use the Web is to search for specific information, including text, pictures, music, and video.

The first step in successful searching is to identify the main idea or concept in the topic about which you are seeking information. Determine any synonyms, alternate spellings, or variant word forms for the topic. Then, use a search tool to locate the information.

Two types of search tools are search engines and subject directories. A search engine is a program that finds Web sites, Web pages, images, videos, news, maps, and other information related to a specific topic. A subject directory classifies Web pages in an organized set of categories, such as sports or shopping, and related subcategories.

Some Web sites offer the functionality of both a search engine and a subject directory. The table in Figure 2-10 lists the Web addresses of several popular general-purpose search engines and subject directories.

<table>
<thead>
<tr>
<th>Search Tool</th>
<th>Web Address</th>
<th>Search Engine</th>
<th>Subject Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>A9</td>
<td>a9.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>AlltheWeb</td>
<td>alltheweb.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>AltaVista</td>
<td>altavista.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>AOL Search</td>
<td>search.aol.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Ask</td>
<td>ask.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bing</td>
<td>bing.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cuil (pronounced cool)</td>
<td>cuil.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dogpile</td>
<td>dogpile.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Excite</td>
<td>excite.com</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Gigablast</td>
<td>gigablast.com</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Google</td>
<td>google.com</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lycos</td>
<td>lycos.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MSN</td>
<td>msn.com</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Open Directory Project</td>
<td>dmoz.org</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WebCrawler</td>
<td>webcrawler.com</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Yahoo!</td>
<td>yahoo.com</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Figure 2-10 Popular search engines and subject directories.

Search Engines A search engine is helpful in locating information for which you do not know an exact Web address or are not seeking a particular Web site. Thousands of search engines are available. Some search through Web pages for all types of information. Other search engines can restrict their searches to a specific type of information, such as the following items:

- Images — pictures, diagrams, and drawings.
- Videos — home videos, music videos, television programs, and movie clips.
- Audio — music, songs, recordings, and sounds.
- Publications — news articles, journals, and books.
- Maps — maps of a business or address, or driving directions to a destination.
- People or Businesses — addresses and telephone numbers.
- Blogs — specific opinions and ideas of others.

Search engines require that you enter a word or phrase, called search text or search query, that describes the item you want to find. Each word in the search text is known as a keyword. Your search text can be broad, such as spring break destinations, or more specific, such as Walt Disney World. Search engines often respond with thousands of results, whose content varies depending on the type of information you are seeking. Some results are links to Web pages or articles; other results are media, such as images or videos. You may find that many items that appear in the search results have little or no bearing on the item you are seeking. You can eliminate the superfluous items in your search results by carefully crafting search text that limits the search.

If you misspell search text, many search engines identify alternative search text. Some also provide suggested keywords, links, and/or images as you begin typing your search text.
Figure 2-11 shows one way to use the Google search engine to search for the text, Aspen Colorado ski resorts. The results of the search, called hits, shown in Step 3 include nearly 150,000 links to Web pages that reference Aspen Colorado ski resorts. Each hit in the list has a link that, when clicked, displays an associated Web site or Web page. Most search engines sequence the hits based on how close the words in the search text are to one another in the titles and descriptions of the hits. Thus, the first few links probably contain more relevant information. Read Ethics & Issues 2-2 for a related discussion.

How to Use a Search Engine

Step 1
Type the search engine’s Web address (in this case, google.com) in the Address bar in the Web browser.

Step 2
Press the ENTER key. When the Google home page is displayed, type Aspen Colorado ski resorts as the search text and then point to the Google Search button.

Step 3
Click the Google Search button. When the results of the search are displayed, scroll through the links and read the descriptions. Point to the Aspen Snowmass link.

Step 4
Click the Aspen Snowmass link to display a Web page with a description and links to skiing in Aspen.
Some Web browsers contain an Instant Search box that, when filled in, uses a predefined or default search engine to perform searches (Figure 2-12). Using the Instant Search box eliminates the steps of displaying the search engine’s Web page prior to entering the search text.

If you enter a phrase with spaces between the words in the search text, most search engines display results (hits) that include all of the words, except for common words (e.g., to, the, and). The table in Figure 2-13 lists some operators you can include in your search text to refine your search. Instead of using operators to refine your search text, many search engines have an Advanced Search feature that displays a form that assists with refining your search.

**ETHICS & ISSUES 2-2**

**Is It Ethical to Manipulate Search Engine Results?**

Search engines attempt to present the most relevant and popular results to users when they perform searches. Search engines use special software to create indexes of topics from as many Web sites as possible. One key piece of information used by search engines to determine the relevance and popularity of a Web site is to examine how many other Web pages link to the Web site. Some individuals and groups take advantage of that fact and attempt to skew search results by creating hundreds or thousands of Web sites that link to a Web site that is the target of the effort. The practice of attempting to skew search engine results is known as **Google bombing**. One example of this is political activists Google bombing their opponents. When a person searches for a particular word or phrase with a negative connotation, the search results become skewed to return results about a political opponent of the Google bomber. A Google bomb can promote a product or service, or disparage a competing product or service. Google bombing often is used in a humorous manner. Comedians and television personalities sometimes request that their audience engage in some particular Google bomb. Opponents of Google bombing state that the practice lessens the public’s trust in search engines and causes the search engines to be less accurate.

Is Google bombing ethical? Why or why not? How should Google bombers be handled? Why? Can Google bombing be stopped? Why or why not? Is there an ethical difference between Google bombs that attack a rival and those that are self-promoting? Why?

**Search Engine Operators**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
<th>Examples</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space or +</td>
<td>Display hits that include specific words.</td>
<td>art + music art music</td>
<td>Results have both words art and music — in any order.</td>
</tr>
<tr>
<td>OR</td>
<td>Display hits that include only one word from a list.</td>
<td>dog OR puppy dog OR puppy OR canine</td>
<td>Results have either the word dog or puppy. Results have the word dog or puppy or canine.</td>
</tr>
<tr>
<td>( )</td>
<td>Combine hits that include specific words with those that include only one word from a list.</td>
<td>Kalamazoo Michigan (pizza OR subs)</td>
<td>Results have both words Kalamazoo Michigan and either the word, pizza, or the word, subs.</td>
</tr>
<tr>
<td>-</td>
<td>Exclude a search results.</td>
<td>automobile -convertible</td>
<td>Results include automobile but do not include convertible.</td>
</tr>
<tr>
<td>“ ”</td>
<td>Search for an exact phrase in a certain order.</td>
<td>“19th century literature”</td>
<td>Results have the exact phrase, 19th century literature.</td>
</tr>
<tr>
<td>*</td>
<td>Substitute characters in place of the asterisk.</td>
<td>writer*</td>
<td>Results include any word that begins with writer (e.g., writer, writers, writer’s).</td>
</tr>
</tbody>
</table>

**Figure 2-13** Use search engine operators to help refine a search.
Other techniques you can use to improve your searches include the following:

- Use specific nouns.
- Put the most important terms first in the search text.
- List all possible spellings, for example, email, e-mail.
- Before using a search engine, read its Help information.
- If the search is unsuccessful with one search engine, try another.

Some search engines that work with navigation devices are location based, meaning they display results related to the device’s current geographical position. For example, your mobile device can display all gas stations within a certain distance of your current location.

Many search engines use a program called a spider to build and maintain lists of words found on Web sites. When you enter search text, the search engine scans this prebuilt list for hits. The more sophisticated the search engine combined with precise search criteria, the more rapid the response and effective the search.

To learn more about searching for information, complete the Learn How To 2 activity on pages 120 and 121.

Subject Directories

A subject directory provides categorized lists of links arranged by subject (Figure 2-14). Using this search tool, you locate a particular topic by clicking links through different levels, moving from the general to the specific. Each time you click a category link, the subject directory displays a list of subcategory links, from which you again choose. You continue in this fashion until the search tool displays a list of Web pages about the desired topic.

The major disadvantage with a subject directory is that users have difficulty deciding which categories to choose as they work through the menus of links presented.

Types of Web Sites

Thirteen types of Web sites are portal, news, informational, business/marketing, blog, wiki, online social network, educational, entertainment, advocacy, Web application, content aggregator, and personal (Figure 2-15). Many Web sites fall in more than one of these categories.
Portal  A portal is a Web site that offers a variety of Internet services from a single, convenient location (Figure 2-15a). Most portals offer these free services: search engine; news; sports and weather; Web publishing; reference tools such as yellow pages, stock quotes, and maps; shopping; and e-mail and other communications services.

Many portals have online communities. An online community is a Web site that joins a specific group of people with similar interests or relationships. These communities may offer online photo albums, chat rooms, and other services to facilitate communications among members.

Popular portals include AltaVista, AOL, Excite, GO.com, iGoogle, Lycos, MSN, and Yahoo!. A wireless portal is a portal designed for Internet-enabled mobile devices.

News  A news Web site contains newsworthy material including stories and articles relating to current events, life, money, sports, and the weather (Figure 2-15b). Many magazines and newspapers sponsor Web sites that provide summaries of printed articles, as well as articles not included in the printed versions. Newspapers and television and radio stations are some of the media that maintain news Web sites.

Informational  An informational Web site contains factual information (Figure 2-15c). Many United States government agencies have informational Web sites providing information such as census data, tax codes, and the congressional budget. Other organizations provide information such as public transportation schedules and published research findings.

Business/Marketing  A business/marketing Web site contains content that promotes or sells products or services (Figure 2-15d). Nearly every enterprise has a business/marketing Web site. Allstate Insurance Company, Dell Inc., General Motors Corporation, Kraft Foods Inc., and Walt Disney Company all have business/marketing Web sites. Many of these enterprises also allow you to purchase their products or services online.
A blog, short for Weblog, is an informal Web site consisting of time-stamped articles, or posts, in a diary or journal format, usually listed in reverse chronological order (Figure 2-15e). A blog that contains video clips is called a video blog, or vlog. A microblog allows users to publish short messages, usually between 100 and 200 characters, for others to read. Twitter is a popular microblog. The term blogosphere refers to the worldwide collection of blogs, and the vlogosphere refers to all vlogs worldwide.

Blogs reflect the interests, opinions, and personalities of the author, called the blogger or vlogger (for vlog author), and sometimes site visitors. Blogs have become an important means of worldwide communications. Businesses create blogs to communicate with employees, customers, and vendors. Teachers create blogs to collaborate with other teachers and students. Home users create blogs to share aspects of their personal life with family, friends, and others.

A wiki is a collaborative Web site that allows users to create, add to, modify, or delete the Web site content via their Web browser. Many wikis are open to modification by the general public. Wikis usually collect recent edits on a Web page so that someone can review them for accuracy. The difference between a wiki and a blog is that users cannot modify original posts made by the blogger. A popular wiki is Wikipedia, a free Web encyclopedia (Figure 2-15f). Read Ethics & Issues 2-3 for a related discussion.

An online social network, also called a social networking Web site, is a Web site that encourages members in its online community to share their interests, ideas, stories, photos, music, and videos with other registered users (Figure 2-15g). Most include chat rooms, newsgroups, and other communications services.

**ETHICS & ISSUES 2-3**

**Should You Trust a Wiki for Academic Research?**

As wikis have grown in number, size, and popularity, some educators and librarians have shunned the sites as valid sources of research. While many wikis are tightly controlled with a limited number of contributors and expert editors, these usually focus on narrowly-defined, specialized topics. Most large online wikis, such as Wikipedia, often involve thousands of editors, many of whom remain anonymous. Recently, television station reporters purposefully vandalized entries on Wikipedia for John Lennon and Elvis Presley in an attempt either to discredit Wikipedia or to test how quickly corrections are made. Editors quickly corrected the information. In other situations, rival political factions falsified or embellished wiki entries in an attempt to give their candidate an advantage. Some wiki supporters argue that most wikis provide adequate controls to correct false or misleading content quickly and to punish those who submit it. One popular wiki now requires an experienced editor to verify changes made to certain types of articles. Some propose that wikis should be used as a starting point for researching a fact, but that the fact should be verified using traditional sources.

Should wikis be allowed as valid sources for academic research? Why or why not? Would you submit a paper to your instructor that cites a wiki as a source? An encyclopedia? Why or why not? What policies could wikis enforce that could garner more confidence from the public? If a wiki provided verification of the credentials of the author, would you trust the wiki more? Why or why not?
Popular social networking Web sites include MySpace and Facebook, with Facebook alone boasting more than 300 million active users. In some social networking Web sites, such as Second Life, users assume an imaginary identity and interact with other users in a role-playing type of environment.

A media sharing Web site is a specific type of online social network that enables members to share media such as photos, music, and videos. Flickr, Fotki, and Webshots are popular photo sharing communities; PixelFish and YouTube are popular video sharing communities.

**Educational** An educational Web site offers exciting, challenging avenues for formal and informal teaching and learning (Figure 2-15h). On the Web, you can learn how airplanes fly or how to cook a meal. For a more structured learning experience, companies provide online training to employees; and colleges offer online classes and degrees. Instructors often use the Web to enhance classroom teaching by publishing course materials, grades, and other pertinent class information.

**Entertainment** An entertainment Web site offers an interactive and engaging environment (Figure 2-15i). Popular entertainment Web sites offer music, videos, sports, games, ongoing Web episodes, sweepstakes, chat rooms, and more. Sophisticated entertainment Web sites often partner with other technologies. For example, you can cast your vote about a topic on a television show.

**Advocacy** An advocacy Web site contains content that describes a cause, opinion, or idea (Figure 2-15j). These Web sites usually present views of a particular group or association. Sponsors of advocacy Web sites include the Democratic National Committee, the Republican National Committee, the Society for the Prevention of Cruelty to Animals, and the Society to Protect Human Rights.

**Web Application** A Web application, or Web app, is a Web site that allows users to access and interact with software through a Web browser on any computer or device that is connected to the Internet. Some Web applications provide free access to their software (Figure 2-15k). Others offer part of their software free and charge for access to more comprehensive features or when a particular action is requested. Examples of Web applications include Google Docs (word processing, spreadsheets, presentations), TurboTax Online (tax preparation), and Windows Live Hotmail (e-mail).
Content Aggregator  A content aggregator is a business that gathers and organizes Web content and then distributes, or feeds, the content to subscribers for free or a fee (Figure 2-15l). Examples of distributed content include news, music, video, and pictures. Subscribers select content in which they are interested. Whenever the selected content changes, it is downloaded automatically (pushed) to the subscriber’s computer or mobile device.

RSS 2.0, which stands for Really Simple Syndication, is a specification that some content aggregators use to distribute content to subscribers. Atom is another specification sometimes used by content aggregators to distribute content. Some current browsers include a feature, such as Internet Explorer's WebSlices, that enables content aggregators to mark sections of their Web pages as feeds to which users can subscribe.

Personal  A private individual or family not usually associated with any organization may maintain a personal Web site or just a single Web page (Figure 2-15m). People publish personal Web pages for a variety of reasons. Some are job hunting. Others simply want to share life experiences with the world.

Evaluating a Web Site  Do not assume that information presented on the Web is correct or accurate. Any person, company, or organization can publish a Web page on the Internet. No one oversees the content of these Web pages. Figure 2-16 lists guidelines for assessing the value of a Web site or Web page before relying on its content.

### Criteria for Evaluating a Web Site's Content

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Reliable Web Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliation</td>
<td>A reputable institution should support the Web site without bias in the information.</td>
</tr>
<tr>
<td>Audience</td>
<td>The Web site should be written at an appropriate level.</td>
</tr>
<tr>
<td>Authority</td>
<td>The Web site should list the author and the appropriate credentials.</td>
</tr>
<tr>
<td>Content</td>
<td>The Web site should be well organized and the links should work.</td>
</tr>
<tr>
<td>Currency</td>
<td>The information on the Web page should be current.</td>
</tr>
<tr>
<td>Design</td>
<td>The pages at the Web site should download quickly, be visually pleasing, and easy to navigate.</td>
</tr>
<tr>
<td>Objectivity</td>
<td>The Web site should contain little advertising and be free of preconceptions.</td>
</tr>
</tbody>
</table>

### Multimedia on the Web

Most Web pages include more than just formatted text and links. The more exciting Web pages use multimedia. Multimedia refers to any application that combines text with graphics, animation, audio, video, and/or virtual reality. Multimedia brings a Web page to life, increases the types of information available on the Web, expands the Web’s potential uses, and makes the Internet a more entertaining place to explore. Multimedia Web pages often require specific hardware and software and take more time to download because they contain large graphics files and video or audio clips. Many Web sites have an option that allows visitors to disable multimedia, for example, if they have a slower-speed Internet connection.

The sections that follow discuss how the Web uses graphics, animation, audio, video, and virtual reality.
Graphics  A graphic, or graphical image, is a digital representation of non-text information such as a drawing, chart, or photo. Today, many Web pages use colorful graphical designs and images to convey messages (Figure 2-17).

The Web contains countless images about a variety of subjects. You can download many of these images at no cost and use them for noncommercial purposes. Recall that downloading is the process of transferring an object from the Web to your computer. For example, you can insert images into greeting cards, announcements, and other documents. Read Innovative Computing 2-1 to find out how astronomers share graphics of the universe.

Of the graphics formats that exist on the Web (Figure 2-18), the two more common are JPEG and GIF formats.

**JPEG** (pronounced JAY-peg) is a format that compresses graphics to reduce their file size, which means the file takes up less storage space. Smaller file sizes result in faster downloading of Web pages because small files transmit faster than large files. The more compressed the file, the smaller the image and the lower the quality. The goal with JPEG graphics is to reach a balance between image quality and file size. Digital photos often use the JPEG format.

**GIF** (pronounced jiff) graphics also use compression techniques to reduce file sizes. The GIF format works best for images that have only a few distinct colors, such as company logos. The newer **PNG** (pronounced ping) graphics format improves upon the GIF format, and thus may eventually replace the GIF format.

The BMP and TIFF formats listed in Figure 2-18 may require special viewer software, and they have larger file sizes. Thus, these formats are not used on the Web as frequently as JPEG, GIF, and PNG formats.

---

**Table: Graphics Formats Used on the Web**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP</td>
<td>Bitmap</td>
<td>Desktop background, scanned images</td>
</tr>
<tr>
<td>GIF</td>
<td>Graphics Interchange Format</td>
<td>Simple diagrams, shapes, images with few colors</td>
</tr>
<tr>
<td>JPEG</td>
<td>Joint Photographic Experts Group</td>
<td>Digital camera photos</td>
</tr>
<tr>
<td>PNG</td>
<td>Portable Network Graphics</td>
<td>Web graphics</td>
</tr>
<tr>
<td>TIFF</td>
<td>Tagged Image File Format</td>
<td>Photos used by printing industry</td>
</tr>
</tbody>
</table>

---

**Figure 2-17**  This Web page uses colorful graphical designs and images to convey its messages.

**INNOVATIVE COMPUTING 2-1**

**View the Wonders of Space through the WorldWide Telescope**

The phrase, reach for the stars, takes on a new meaning when using Microsoft’s WorldWide Telescope. Users can access the Telescope from a Web browser or download free software. They then can view a variety of multimedia, including high-resolution graphics from telescopes located on Earth and in space, with Web 2.0 services to allow people to explore the final frontier from their computers.

Users can pan and zoom around the night sky by looking through a specific telescope, such as the Hubble Space Telescope, and view the universe in the past, present, or future. In addition, they can browse graphics of a specific planet, the Milky Way Galaxy, black holes, and other celestial bodies in our solar system, galaxy, and beyond. They also can select different wavelengths, such as X-ray or visible light, to search for objects. Astronomers and educators also have created narrated tours of the sky to help interpret the images.

For more information, visit scsite.com/dc2011/ch2/innovative and then click WorldWide Telescope.
Some Web sites use thumbnails on their pages because graphics can be time-consuming to display. A **thumbnail** is a small version of a larger graphic. You usually can click a thumbnail to display a larger image (Figure 2-19).

**Animation** Many Web pages use **animation**, which is the appearance of motion created by displaying a series of still images in sequence. Animation can make Web pages more visually interesting or draw attention to important information or links. For example, text that animates by scrolling across the screen can serve as a ticker to display stock updates, news, sports scores, weather, or other information. Web-based games often use animation.

Web page developers add animation to Web pages using a variety of techniques. Web page authoring programs, such as Adobe Flash and Microsoft Expression Web, enable Web site developers to combine animation and interactivity in Web pages. Developers unfamiliar with Web page authoring programs can create an **animated GIF**, which combines several GIF images in a single GIF file.

**Audio** On the Web, you can listen to audio clips and live audio. **Audio** includes music, speech, or any other sound. Simple applications consist of individual audio files available for download to a computer or device. Once downloaded, you can play (listen to) the contents of these files. Some common Web audio file formats are listed in Figure 2-20. Audio files are compressed to reduce their file sizes. For example, the **MP3** format reduces an audio file to about one-tenth its original size, while preserving much of the original quality of the sound.

Some music publishers have Web sites that allow users to download sample tracks free to persuade them to buy all the songs contained on the CD. Others allow a user to purchase and download an entire CD (Figure 2-21). It is legal to download copyrighted music only if the song’s copyright holder has granted permission for users to download and play the song.

To listen to an audio file on your computer, you need special software called a **player**. Most current operating systems contain a player, for example, Windows Media Player. Some audio files, however, might require you to download a player. Players available for download include iTunes and RealPlayer. You can download the players free from the Web; some are plug-ins, which are discussed later in this chapter.

Some applications on the Web use streaming audio. **Streaming** is the process of transferring data in a continuous and even flow. Streaming allows users to access and use a file while it is transmitting. For example, streaming audio enables you to listen to music as it downloads to your computer. Many radio and television stations use streaming audio to broadcast music, interviews, talk shows, sporting events, music videos, news, live concerts, and other segments.

Podcasting is another popular method of distributing audio. A **podcast** is recorded audio, usually an MP3 file, stored on a Web site that can be downloaded to a computer or a portable media player such as an iPod. Examples of podcasts include music, radio shows, news stories, classroom lectures, political messages, and television commentaries. Podcasters register their podcasts with content aggregators. Subscribers select podcast feeds they want to be downloaded automatically whenever they connect. Most smart phone users who subscribe to a wireless Internet service provider can listen to streaming audio and podcasts.
Audio Web File Formats

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC</td>
<td>Advanced Audio Coding</td>
<td>WAV</td>
<td>Windows waveform</td>
</tr>
<tr>
<td>AIFF</td>
<td>Audio Interchange File Format</td>
<td>WMA</td>
<td>Windows Media Audio (part of Windows Media framework)</td>
</tr>
<tr>
<td>ASF</td>
<td>Advanced Streaming (or Systems) Format (part of Windows Media framework)</td>
<td>RA</td>
<td>RealAudio sound file (supported by RealPlayer)</td>
</tr>
<tr>
<td>MP3</td>
<td>Moving Pictures Experts Group Audio Layer 3 (MPEG-3)</td>
<td>QT</td>
<td>QuickTime audio, video, or 3-D animation</td>
</tr>
<tr>
<td>Ogg</td>
<td>Free, unpatented audio and video format</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2-20  Popular Web audio file formats.

How to Purchase and Download Music Using iTunes

Step 1  Display the iTunes program on the screen. Search for, select, and pay for the music you want to purchase from the iTunes Music Store, which is integrated in the iTunes program.

Step 2  Download the music from the iTunes Music Store server to your computer’s hard disk.

Step 3a  Listen to the music from your computer’s hard disk.

Step 3b  Download music from your computer’s hard disk to a portable media player. Listen to the music through earbuds attached to the portable media player.

Figure 2-21  This figure shows how to purchase and download music using iTunes.
Video On the Web, you can view video clips or watch live video. Video consists of images displayed in motion. Most video also has accompanying audio. You can use the Internet to watch live and/or prerecorded coverage of your favorite television programs or enjoy a live performance of your favorite vocalist. You can upload, share, or view video clips at a video sharing Web site such as YouTube (Figure 2-22). Educators, politicians, and businesses are using video blogs and video podcasts to engage students, voters, and consumers.

Simple video applications on the Web consist of individual video files, such as movie or television clips, that you must download completely before you can play them on the computer. Video files often are compressed because they are quite large in size. These clips also are short in length, usually less than 10 minutes, because they can take a long time to download. The Moving Pictures Experts Group (MPEG) defines a popular video compression standard, a widely used one called MPEG-4 or MP4. Another popular video format is Adobe Flash.

As with streaming audio, streaming video allows you to view longer or live video images as they download to your computer. Widely used standards supported by most Web browsers for transmitting streaming video data on the Internet are AVI (Audio Video Interleaved), QuickTime, Windows Media Format, and RealVideo. Like RealAudio, RealVideo is supported by RealPlayer.

Virtual Reality Virtual reality (VR) is the use of computers to simulate a real or imagined environment that appears as a three-dimensional (3-D) space. VR involves the display of 3-D images that users explore and manipulate interactively.

Using special VR software, a Web developer creates an entire 3-D environment that contains infinite space and depth, called a VR world. A VR world, for example, might show a house for sale. Potential buyers walk through rooms in the VR house by moving an input device forward, backward, or to the side.

FAQ 2-5

How are social networking Web sites and Internet video affecting Internet traffic?

A report from Cisco Systems states that Internet traffic will double every two years until 2012. The volume of Internet traffic is increasing mostly because of Internet videos and social networking. In addition, the increased use of video conferencing by business users also accounts for the increase in traffic.

For more information, visit scsite.com/dc2011/ch2/faq and then click Internet Traffic.
Games and simulations on optical disc or on the Web often use VR (Figure 2-23). Many practical applications of VR also exist. Science educators create VR models of molecules, organisms, and other structures for students to examine. Companies use VR to showcase products or create advertisements. Architects create VR models of buildings and rooms so that clients can see how a completed construction project will look before it is built.

**Plug-ins** Most Web browsers have the capability of displaying basic multimedia elements on a Web page. Sometimes, a browser might need an additional program, called a plug-in. A plug-in, or add-on, is a program that extends the capability of a browser. You can download many plug-ins at no cost from various Web sites (Figure 2-24). Some plug-ins run on all sizes of personal computers and mobile devices. Others have special versions for mobile devices.

**Web Publishing** Before the World Wide Web, the means to share opinions and ideas with others easily and inexpensively was limited to the media, classroom, work, or social environments. Generating an advertisement or publication that could reach a massive audience required much expense. Today, businesses and individuals convey information to millions of people by creating their own Web pages. The content of the Web pages ranges from news stories to product information to blogs.

**Popular Plug-Ins**

<table>
<thead>
<tr>
<th>Plug-In Application</th>
<th>Description</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrobat Reader</td>
<td>View, navigate, and print Portable Document Format (PDF) files — documents formatted to look just as they look in print</td>
<td>adobe.com</td>
</tr>
<tr>
<td>Flash Player</td>
<td>View dazzling graphics and animation, hear outstanding sound and music, display Web pages across an entire screen</td>
<td>adobe.com</td>
</tr>
<tr>
<td>Java</td>
<td>Enable Web browser to run programs written in Java, which add interactivity to Web pages</td>
<td>java.com</td>
</tr>
<tr>
<td>QuickTime</td>
<td>View animation, music, audio, video, and VR panoramas and objects directly on a Web page</td>
<td>apple.com</td>
</tr>
<tr>
<td>RealPlayer</td>
<td>Listen to live and on-demand near-CD-quality audio and news cast-quality video, stream audio and video content for faster viewing, play MP3 files, create music CDs</td>
<td>real.com</td>
</tr>
<tr>
<td>Shockwave Player</td>
<td>Experience dynamic interactive multimedia, 3-D graphics, and streaming audio</td>
<td>adobe.com</td>
</tr>
<tr>
<td>Silverlight</td>
<td>Experience high-definition video, high-resolution interactive multimedia, and streaming audio and video</td>
<td>microsoft.com</td>
</tr>
<tr>
<td>Windows Media Player</td>
<td>Listen to live and on-demand audio, play or edit WMA and MP3 files, burn CDs, and watch DVD movies</td>
<td>microsoft.com</td>
</tr>
</tbody>
</table>

**Figure 2-23** Residents (users) of the Second Life online social network interact with other online residents (users) in a VR world.

**Figure 2-24** Most plug-ins can be downloaded free from the Web.
Web publishing is the development and maintenance of Web pages. To develop a Web page, you do not have to be a computer programmer. For the small business or home user, Web publishing is fairly easy as long as you have the proper tools. To learn more about how to publish a document on the Web, complete the Learn How To 3 activity on page 121.

The five major steps in Web publishing are as follows:

1. **Plan a Web site.**
   Think about issues that could affect the design of the Web site. Identify the purpose of the Web site and the characteristics of the people whom you want to visit the Web site. Determine ways to differentiate your Web site from other similar ones.

2. **Analyze and design a Web site.**
   Design the layout of elements of the Web site such as links, text, graphics, animation, audio, video, and virtual reality. Required hardware may include a digital camera, Web cam, scanner, sound card, and microphone.

3. **Create a Web site.**
   Use a word processing program to create basic Web pages that contain text and graphics. Use Web page authoring software to create more sophisticated Web sites that include text, graphics, animation, audio, video, and special effects. For advanced features such as managing users, passwords, chat rooms, and e-mail, you may need to purchase specialized Web site management software.

4. **Deploy a Web site.**
   Transfer the Web pages from your computer to a Web server. Many Internet access providers offer their customers storage space on a Web server. Another option is a Web hosting service, which provides storage space on a Web server for a reasonable monthly fee. To help others locate your Web page, register your Web address with various search engines to ensure your site will appear in the hit lists for searches for certain keywords.

5. **Maintain a Web site.**
   Visit the Web site regularly to ensure the Web site contents are current and all links work properly.

### E-Commerce

**E-commerce**, short for *electronic commerce*, is a business transaction that occurs over an electronic network such as the Internet. Anyone with access to a computer or mobile device, an Internet connection, and a means to pay for purchased goods or services can participate in e-commerce. Some people use the term **m-commerce** (mobile commerce) to identify e-commerce that takes place using mobile devices.

Popular uses of e-commerce by consumers include retail, finance, travel, entertainment, and health. Users can purchase just about anything on the Web, including groceries, flowers, books, computers, music, movies, cars, airline tickets, and concert tickets. They also can pay bills, invest in stocks, make airline reservations, reserve a hotel or car, and fill prescriptions.

Three types of e-commerce are business-to-consumer, consumer-to-consumer, and business-to-business. **Business-to-consumer (B2C)** e-commerce consists of the sale of goods and services to the general public. For example,
Apple has a B2C Web site. Instead of visiting a retail store to purchase an iPod, customers can order one directly from Apple's Web site.

A customer (consumer) visits an online business through an electronic storefront, which contains product descriptions, images, and a shopping cart. The shopping cart allows the customer to collect purchases. When ready to complete the sale, the customer enters personal data and the method of payment, which should be through a secure Internet connection. E-retail, short for electronic retail, occurs when businesses use the Web to sell products (Figure 2-25).

### FAQ 2-6

**Is it safe to shop online?**

Not always. Although 78 percent of shoppers find online shopping convenient, about 75 percent of surveyed individuals are hesitant to enter their personal or credit card information online. It always is best to conduct online transactions with well-established companies. If possible, research these companies and read about others’ online shopping experiences before making a purchase. If you never have heard of a particular online business, do not entrust them with your credit card information.

For more information, visit scsite.com/dc2011/ch2/faq and then click Online Shopping.
Consumer-to-consumer (C2C) e-commerce occurs when one consumer sells directly to another, such as in an online auction. With an **online auction**, users bid on an item being sold by someone else. The highest bidder at the end of the bidding period purchases the item. eBay is one of the more popular online auction Web sites.

As an alternative to entering credit card, bank account, or other financial information online, some shopping and auction Web sites allow consumers to use an online payment service such as PayPal or Google Checkout. To use an online payment service, you create an account that is linked to your credit card or funds at a financial institution. When you make a purchase, you use your online payment service account, which transfers money for you without revealing your financial information. Read Innovative Computing 2-2 to find out how shoppers can experience 3-D online stores.

Most e-commerce, though, actually takes place between businesses, which is called **business-to-business (B2B) e-commerce**. Businesses often provide goods and services to other businesses, such as online advertising, recruiting, credit, sales, market research, technical support, and training. For example, some MasterCard and Visa credit card companies provide corporations with Web-based purchasing, tracking, and transaction downloading capabilities.

**Other Internet Services**

The Web is only one of the many services on the Internet. The Web and other Internet services have changed the way we communicate. We use computers and mobile devices to send e-mail messages to the president, have a discussion with experts about the stock market, chat with someone in another country about genealogy, and talk about homework assignments with classmates via instant messages. Many times, these communications take place completely in writing — without the parties ever meeting each other. Read Ethics & Issues 2-4 for a related discussion.

The following pages discuss these Internet services: e-mail, mailing lists, instant messaging, chat rooms, VoIP (Voice over IP), newsgroups and message boards, and FTP (File Transfer Protocol).

**ETHICS & ISSUES 2-4**

Should You Be Judged by Your Internet Communications?

Internet features, such as e-mail, instant messages, and chat, have become some of today’s most popular methods of communications. Millions of people around the world send and receive various forms of Internet messages. The Internet links the geographically distanced, connects the economically separated, enables the physically challenged, and encourages the publicly timid. Almost all office workers are prolific users of Internet communications because their job depends on a great deal of collaboration with co-workers, management, vendors, and other departments.

Because of the ease of use of such forms of communications, people are writing more than ever before — but is it good writing? The carefully crafted letters of an era gone by, handwritten in beautiful penmanship, have been replaced by messages stylistically equivalent to notes on the refrigerator. The immediacy of the Internet often results in messages that are ill conceived, casually spelled, poorly worded, grammatically flawed, and tritely expressed. Despite experts suggesting that users always should proofread messages carefully before sending them, communications often are misinterpreted or come across as being rude.

Should employers require that employees adhere to e-mail authoring policies? In general, has e-mail’s impact on communications been positive or negative? Why? Would you judge somebody by the quality of his or her e-mail message? Why or why not? Could someone’s professional reputation be enhanced or hindered by the quality and effectiveness of his or her Internet communications?
E-Mail

E-mail (short for electronic mail) is the transmission of messages and files via a computer network. E-mail was one of the original services on the Internet, enabling scientists and researchers working on government-sponsored projects to communicate with colleagues at other locations. Today, e-mail is a primary communications method for both personal and business use.

You use an e-mail program to create, send, receive, forward, store, print, and delete e-mail messages. Outlook and Windows Live Mail are two popular desktop e-mail programs; Gmail and Windows Live Hotmail are two popular free e-mail Web applications. The steps in Figure 2-26 illustrate how to send an e-mail message using Outlook.

How to Send an E-Mail Message Using Outlook

Step 1
Start an e-mail program and point to the New Mail Message button.

Step 2
Click the New Mail Message button to display the Message window.

Step 3
Enter the recipient’s e-mail address, the subject, and the message in the Message window.

Step 4
Click the Attach File button on the Message tab to attach a JPEG file containing a photo to the message. Click the Send button to send the message.

Step 5
When Dale receives the e-mail message, she opens the JPEG file to view the photo.

Figure 2-26 This figure shows how to send an e-mail message using Outlook.
The message can be simple text or can include an attachment such as a word processing document, a graphic, an audio clip, or a video clip. To learn more about how to attach a file to an e-mail message, complete the Learn How To 1 activity on page 120.

Just as you address a letter when using the postal system, you address an e-mail message with the e-mail address of your intended recipient. Likewise, when someone sends you a message, he or she must have your e-mail address. An **e-mail address** is a combination of a user name and a domain name that identifies a user so that he or she can receive Internet e-mail.

A **user name** is a unique combination of characters, such as letters of the alphabet and/or numbers, that identifies a specific user. Your user name must be different from the other user names in the same domain. For example, a user named Kiley Barnhill whose server has a domain name of scsite.com might want to select kbarnhill as her user name. If scsite.com already has a kbarnhill (for Ken Barnhill), Kiley will have to select a different user name, such as kileybarnhill or k_barnhill.

Sometimes, organizations decide user names for new users. In many cases, however, users select their own user names, often selecting a nickname or any other combination of characters for their user name. Many users select a combination of their first and last names so that others can remember it easily.

In an Internet e-mail address, an @ (pronounced at) symbol separates the user name from the domain name. Your service provider supplies the domain name. A possible e-mail address for Kiley Barnhill would be kbarnhill@scsite.com, which would be read as follows: K Barnhill at s c i t e dot com. Most e-mail programs allow you to create an **address book**, or contacts folder, which contains a list of names and e-mail addresses.

Figure 2-27 illustrates how an e-mail message may travel from a sender to a receiver using a desktop e-mail program. When you send an...
e-mail message, an outgoing mail server that is operated by your Internet access provider determines how to route the message through the Internet and then sends the message. SMTP (simple mail transfer protocol) is a communications protocol used by some outgoing mail servers.

As you receive e-mail messages, an incoming mail server — also operated by your Internet access provider — holds the messages in your mailbox until you use your e-mail program to retrieve them. POP3, the latest version of POP (Post Office Protocol), is a communications protocol used by some incoming mail servers. Most e-mail programs have a mail notification alert that informs you via a message and/or sound when you receive new mail.

**Mailing Lists**

A **mailing list**, also called an e-mail list or distribution list, is a group of e-mail names and addresses given a single name. When a message is sent to a mailing list, every person on the list receives a copy of the message in his or her mailbox. For example, your credit card company may add you to its mailing list in order to send you special offers. To add your e-mail name and address to a mailing list, you **subscribe** to it (Figure 2-28). To remove your name, you **unsubscribe** from the mailing list.

Thousands of mailing lists exist about a variety of topics in areas of entertainment, business, computers, society, culture, health, recreation, and education. Many vendors use mailing lists to communicate with their customer base.

**FAQ 2-7**

**Can my computer get a virus through e-mail?**

Yes. A **virus** is a computer program that can damage files and the operating system. One way that virus authors attempt to spread a virus is by sending virus-infected e-mail attachments. If you receive an e-mail attachment, you should use an antivirus program to verify that it is virus free.

For more information, read the High-Tech Talk article on page 178, the section about viruses and antivirus programs in Chapter 8, and visit scsite.com/dc2011/ch2/faq and then click Viruses.

Figure 2-28  When you join a mailing list, you and all others on the mailing list receive e-mail messages from the Web site.
Instant Messaging

Instant messaging (IM) is a real-time Internet communications service that notifies you when one or more people are online and then allows you to exchange messages or files or join a private chat room with them. Real time means that you and the people with whom you are conversing are online at the same time. Some IM services support voice and video conversations (Figure 2-29). Many IM services also can alert you to information such as calendar appointments, stock quotes, weather, or sports scores. They also allow you to send photos

An Example of Instant Messaging

Step 1
Log in to the IM server.

Step 2
The server determines if any of your established friends, family, or coworkers, called buddies, are online.

Step 3
You send instant messages, voice, and/or video communications to an online buddy.

Step 4
Your instant message, voice, and/or video travels through a messaging server and then to the online buddy’s computer.

Step 5
Your online buddy replies.

Figure 2-29  This figure shows an example of instant messaging.
or other documents to a recipient, listen to streaming music, and play games with another online party. For IM to work, both parties must be online at the same time. Also, the receiver of a message must be willing to accept messages.

To use IM, you may have to install instant messenger software on the computer or mobile device, such as a smart phone, you plan to use. Some operating systems, such as Windows, include an instant messenger. Popular IM software includes AIM (AOL Instant Messenger), Google Talk, MySpace IM, Windows Live Messenger, and Yahoo! Messenger.

Few IM programs follow IM standards. To ensure successful communications, all individuals on the contact list need to use the same or a compatible instant messenger.

**FAQ 2-8**

How popular are various online communications methods?

A research study conducted by Ipsos revealed that e-mail is expected to remain the preferred method of online communications during the next several years, at least. Methods of online communications expected to become more popular in the future include (listed from most popular to least popular) video conferencing, instant messaging, and text messaging.

For more information, visit scsite.com/dc2011/ch2/faq and then click Online Communications.

Chat Rooms

A chat is a real-time typed conversation that takes place on a computer. A chat room is a location on an Internet server that permits users to chat with each other. Anyone in the chat room can participate in the conversation, which usually is specific to a particular topic.

As you type on your keyboard, a line of characters and symbols is displayed on the computer screen. Others connected to the same chat room server also see what you have typed (Figure 2-30). Some chat rooms support voice chats and video chats, in which people hear or see each other as they chat.

To start a chat session, you connect to a chat server through a program called a chat client. Today’s browsers usually include a chat client. If yours does not, you can download a chat client from the Web. Some Web sites allow users to conduct chats without a chat client.

Once you have installed a chat client, you can create or join a conversation on the chat server to which you are connected. The chat room should indicate the discussion topic. The person who creates a chat room acts as the operator and has responsibility for monitoring the conversation and disconnecting anyone who becomes disruptive. Operator status can be shared or transferred to someone else.

Figure 2-30  As you type, the words and symbols you enter are displayed on the computer screens of other people in the same chat room. To save time many chat and IM users type abbreviations and acronyms for phrases, such as ‘r u there?’, which stands for ‘Are you there?’.
VoIP

VoIP, (Voice over IP, or Internet Protocol) also called Internet telephony, enables users to speak to other users over the Internet. That is, VoIP uses the Internet (instead of the public switched telephone network) to connect a calling party to one or more local or long-distance called parties.

To place an Internet telephone call, you need a high-speed Internet connection (such as a DSL or cable modem); Internet telephone service; a microphone or telephone, depending on the Internet telephone service; and Internet telephone software or a VoIP router, or a telephone adapter, depending on the Internet telephone service. VoIP services also are available on some mobile devices that have wireless Internet service. Calls to other parties with the same Internet telephone service often are free, while calls that connect to the telephone network typically cost about $15 to $35 per month.

As you speak in a microphone connected to your computer or a telephone connected to the VoIP router or telephone adapter, the Internet telephone software and the computer’s sound card or the VoIP router or telephone adapter convert your spoken words (analog signals) to digital signals and then transmit the digitized audio over the Internet to the called parties. Software and equipment at the receiving end reverse the process so that the receiving parties can hear what you have said. Figure 2-31 illustrates one possible configuration for VoIP.

Figure 2-31 One type of equipment configuration for a user making a call via VoIP.
Newsgroups and Message Boards

A **newsgroup** is an online area in which users have written discussions about a particular subject (Figure 2-32). To participate in a discussion, a user posts a message, called an article, to the newsgroup, and other users in the newsgroup read and reply to the message. A **thread** or **threaded discussion** consists of the original article and all subsequent related replies.

A computer that stores and distributes newsgroup messages is called a news server. Some newsgroups require you to enter a user name and password to participate in the discussion. For example, a newsgroup for students taking a college course may require a user name and password to access the newsgroup. This ensures that only students in the course participate in the discussion.

To participate in a newsgroup, typically you use a program called a **newsreader**. Windows Live Mail includes a newsreader. Some Web sites, such as Google Groups, that sponsor newsgroups have a built-in newsreader.

A popular Web-based type of discussion group that does not require a newsreader is a **message board**. Many Web sites use message boards instead of newsgroups because they are easier to use.

FTP

FTP (File Transfer Protocol) is an Internet standard that permits file uploading and downloading with other computers on the Internet. Uploading is the opposite of downloading; that is, **uploading** is the process of transferring documents, graphics, and other objects from your computer to a server on the Internet. Web page authors, for example, often use FTP to upload their Web pages to a Web server.

Many operating systems include FTP capabilities. If yours does not, you can download FTP programs from the Web, usually for a small fee.

An **FTP server** is a computer that allows users to upload and/or download files using FTP. An FTP site is a collection of files including text, graphics, audio clips, video clips, and program files that reside on an FTP server. Many FTP sites have **anonymous FTP**, whereby anyone can transfer some, if not all, available files. Some FTP sites restrict file transfers to those who have authorized accounts (user names and passwords) on the FTP server.

Large files on FTP sites often are compressed to reduce storage space and download time. Before you can use a compressed (zipped) file, you must uncompress (unzip) it. Chapter 8 discusses utilities that zip and unzip files.

Figure 2-32  Users in a newsgroup read and reply to other users’ messages.
Netiquette

Netiquette, which is short for Internet etiquette, is the code of acceptable behaviors users should follow while on the Internet; that is, it is the conduct expected of individuals while online. Netiquette includes rules for all aspects of the Internet, including the World Wide Web, e-mail, instant messaging, chat rooms, FTP, and newsgroups and message boards. Figure 2-33 outlines some of the rules of netiquette. Read Ethics & Issues 2-5 for a related discussion.

NETIQUETTE — Golden Rule: Treat others as you would like them to treat you.

1. In e-mail, chat rooms, and newsgroups:
   - Keep messages brief. Use proper grammar, spelling, and punctuation.
   - Be careful when using sarcasm and humor, as it might be misinterpreted.
   - Be polite. Avoid offensive language.
   - Read the message before you send it.
   - Use meaningful subject lines.
   - Avoid sending or posting flame wars, which are exchanges of flames.
   - Avoid sending spam, which is the Internet's version of junk mail. Spam is an unsolicited e-mail message or newsgroup posting sent to many recipients or newsgroups at once.
   - Do not use all capital letters, which is the equivalent of SHOUTING!
   - Use emoticons to express emotion. Popular emoticons include:
     - :)  Smile
     - :|  Indifference
     - :o  Surprised
     - :(  Frown
     - :
     - Undecided
   - Use abbreviations and acronyms for phrases:
     - btw  by the way
     - imho  in my humble opinion
     - fyi  for your information
     - ttfn  ta ta for now
     - fwiw  for what it's worth
     - tyvm  thank you very much
   - Clearly identify a spoiler, which is a message that reveals a solution to a game or ending to a movie or program.

2. Read the FAQ (frequently asked questions), if one exists. Many newsgroups and Web pages have an FAQ.

3. Do not assume material is accurate or up-to-date. Be forgiving of other's mistakes.

4. Never read someone's private e-mail.

Figure 2-33 Some of the rules of netiquette.

ETHICS & ISSUES 2-5

Would Banning Anonymous Comments Reduce Cyberbullying?

Recently, several high-profile cases highlighted the issue of cyberbullying. Cyberbullying is the harassment of computer users, often teens and pre-teens, through various forms of Internet communications. The behavior typically occurs via e-mail, instant messaging, and chat rooms, and can result in a traumatic experience for the recipient. The bullying may be in the form of threats, spreading of rumors, or humiliation. Usually, the perpetrators of cyberbullying remain anonymous. Many people believe that the anonymous nature of the Internet directly leads to this unscrupulous behavior. Some government officials and advocacy groups have asked for laws that would ban anonymous comments in chat rooms and require that Internet access providers verify and record the true identity of all users. Others have proposed that it be illegal to sign up for an e-mail account or instant messaging account with a fake screen name. Opponents of such plans claim that anonymity and privacy are too important to give up. They state, for example, that the right to be critical of the government in an anonymous forum is a basic right. The rights of everyone should not be infringed upon due to bad behavior of a small group of people.

Would banning anonymous comments reduce cyberbullying? Why or why not? What are the positive and negative aspects of the freedom to remain anonymous on the Internet? What other measures can be taken to reduce cyberbullying? What role can parents play in reducing cyberbullying?
Chapter Summary

This chapter presented the history and structure of the Internet. It discussed the World Wide Web at length, including topics such as browsing, navigating, searching, Web publishing, and e-commerce. It also introduced other services available on the Internet, such as e-mail, mailing lists, instant messaging, chat rooms, VoIP, newsgroups and message boards, and FTP. Finally, the chapter listed rules of netiquette.

Computer Usage @ Work

Entertainment

Do you wonder how music on the radio sounds so perfectly in tune, how animated motion pictures are created, or how one controls lighting during a concert? Not only does the entertainment industry rely on computers to advertise and sell their services on the Internet, computers also assist in other aspects, including audio and video composition, lighting control, computerized animation, and computer gaming.

As mentioned in this chapter, entertainment Web sites provide music and movies you can purchase and download to your computer or mobile device; live news broadcasts, performances, and sporting events; games you can play with other online users; and much more.

As early as 1951, computers were used to record and play music. Today, computers play a much larger role in the music industry. For example, if you are listening to a song on the radio and notice that not one note is out of tune, it is possible that software was used to change individual notes without altering the rest of the song.

Many years ago, creating cartoons or animated motion pictures was an extremely time-consuming task because artists were responsible for sketching thousands of drawings by hand. Currently, artists use computers to create these drawings in a fraction of the time, which significantly can reduce the time and cost of development.

Computers also are used in the game industry. While some game developers create games from scratch, others might use game engines that simplify the development process. For example, LucasArts created the GrimE game engine, which is designed to create adventure games.

During a concert, lighting technicians use computer programs to turn lights off and on, change color, or change location at specified intervals. In fact, once a performance begins, the technicians often merely are standing by, monitoring the computer as it performs most of the work. A significant amount of time and effort, however, is required to program the computer to perform its required tasks during a live show.

The next time you listen to a song, watch a movie, play a game, or attend a concert, think about the role computers play in contributing to your entertainment.

Quiz Yourself Online: To further check your knowledge of pages 98 through 108, visit scsite.com/dc2011/ch2/quiz and then click Objectives 10 – 12.
Every computer on the Internet has a unique address, called an IP address, that distinguishes it from other computers on the Internet. Currently, two versions of IP addresses exist: IPv4 (Internet Protocol Version 4) and IPv6 (Internet Protocol Version 6). An IPv4 address has two parts that identify a specific computer: one part to identify the network where that computer resides and a second part to pinpoint the specific computer or host within that network. An IPv6 address has three parts: a global prefix to identify the network, a subnet to identify the location within the network, and the interface ID to identify the specific computer or host (Figure 2-34).

Today, IPv4 addresses are more commonly used. For this reason, the terms IP address and IPv4 address are used interchangeably. A typical IPv4 address — such as 72.14.207.99 — has four groups of numbers that range from 0 through 255. This form of the IP address sometimes is called a dotted decimal number or dotted quad.

The four groups of numbers in the dotted quad are called octets, because they each have 8 bits when viewed in binary form for a total of 32 bits in the IP address. For instance, the binary form of 72.14.207.99 is 01001000.00001110.11001111.01100011. More information about how the binary system works, see Appendix C.

Because each of the 8 bits can be 1 or 0, the total possible combinations per octet are 2^8, or 256. Combining the four octets of an IP address provides a possible 2^32 or 4,294,967,296 unique values. The actual number of available addresses is about 3 billion, because some values are reserved for special use and are, therefore, off limits.

IP addresses, which are assigned by InterNIC (The Internet’s Network Information Center), belong to one of three network classes: A, B, or C. In a Class A network, the first octet of the IPv4 address is assigned a number between 1 and 127. Large enterprises typically are assigned a Class A network, which can contain more than 16 million hosts; this allows network administrators to assign a value of their choice to the remaining three octets. Class B networks contain a number between 128 and 191 in the first octet. The second octet also is fixed, but the organization can assign values of its choice to the third and fourth octets. Class B networks have more than 65,000 hosts.

Class C networks begin with a value between 192 and 233 and allow only the fourth octet to be customized. Class C networks can have only 254 hosts. Class D and E networks also exist, although they rarely are used.

To request data such as a Web page from a computer on the Internet, you need only an IP address. For instance, if you type the IPv4 address 72.14.207.99 in your Web browser’s Address bar, the browser will display the home page on the machine hosting the Google Web site. Remembering an IP address is difficult at best — so you probably would just type the domain name, www.google.com, in the browser. The browser then contacts a domain name server (DNS) to resolve the human-readable domain name into a machine-readable IP address. Each domain name server houses a simple database that maps domain names to IP addresses. The DNS would resolve the human-readable domain name, www.google.com, into a machine-readable IP address, 72.14.207.99.

Domain names are helpful because they are easier for people to remember than IP addresses. You can learn more about a domain using the whois form at the Network Solutions Web site (www.netsol.com) and then click the WHOIS link. If you type a domain name, such as google.com, the form displays the registration information for that domain, including its IP address.

Like all other computers, your computer must have an IP address to connect to the Internet or another computer that has an IP address. Servers generally have static IP addresses, because they usually are connected to the Internet and their IP addresses do not change often. When you connect to the Internet using your home computer, you most likely are using a temporary or dynamic IP address. Your access provider uses the Dynamic Host Configuration Protocol (DHCP) to assign your computer a temporary dynamic IP address from a pool of IP addresses. The dynamic IP address is unique only for that session. Once you disconnect, the DHCP server releases that IP address back in the IP address pool so that it can assign it to the next requesting computer. Even if you immediately reconnect, the DHCP server might not assign you the same IP address. Using DHCP and dynamic IP addresses means an Internet access provider needs only one IP address for each modem it supports, rather than one for each of its millions of customers.

Billions of IP addresses sounds like a lot. But, because so many computers and other devices connected to the Internet need unique IP addresses, a growing shortage of IP addresses exists. The newer IP addressing scheme is IPv6, also called IPng (IP Next Generation, which) will lengthen IP addresses from 32 bits to 128 bits and increase the number of available IP addresses to a whopping 3.4 x 10^38, or 340,000,000,000,000,000,000,000,000,000,000,000,000,000,000. Software is available that will install IPv6 on most current computers, although many networks and Internet service providers do not yet require its use. In fact, it could be many years before IPv6 completely replaces IPv4.

Do you want to know the IP address currently assigned to your computer? Click the Start button on the Windows taskbar and then click Control Panel. Click Network and Internet and then click View Network Status and Tasks. Finally, click View Status and then click Details.

For more information, visit scsite.com/dc2011/ch2/tech and then click IP Addresses.
Millions of products are traded daily on eBay auctions, whether it is across town or across the globe. The more than 88 million registered worldwide shoppers generate at least $1.8 billion in annual revenue through purchases on the main Web site, eBay, along with items on Shopping.com, tickets on StubHub, classifieds on Kijiji, and other e-commerce venues.

The shoppers likely pay for their merchandise using PayPal, another eBay service. This merchant service allows buyers to transfer money from savings accounts or use their credit card without having to expose the account number to the seller. Other eBay companies are Rent.com, which offers listings for apartments and houses, and Shopping.com, which allows consumers to find and compare products. In 2009, eBay introduced a program to more easily identify its top-rated sellers. It also invited buyers and sellers to become members of the eBay Green Team, which encourages and promotes environmentally friendly business practices.

Being the creator of the World Wide Web is an impressive item on any resume, and it certainly helped Tim Berners-Lee become the 3Com Founders Professor of Engineering at the Massachusetts Institute of Technology in 2008. As a professor in the electrical engineering and computer science departments, he researches social and technical collaboration on the Internet.

Berners-Lee’s interest in sharing information via Web servers, browsers, and Web addresses developed in 1989 while working at CERN, the European Organization for Nuclear Research, in Geneva, Switzerland. He continued to improve his design of a program that tracked random associations for several years and then became the director of the World Wide Web Consortium (W3C), a forum to develop Web standards, in 1994.

Queen Elizabeth bestowed the Order of Merit—the highest civilian honor—upon the British-born Berners-Lee in 2007.

Technology Trailblazers

TIM BERNERS-LEE  Creator of the World Wide Web

As one of the youngest self-made billionaires in history, Mark Zuckerberg could have chosen his top performer of the finest things in life. Instead, he lives very modestly and walks to Facebook’s Palo Alto headquarters.

Both Microsoft and AOL had recruited Zuckerberg during his senior year in high school in New Hampshire. He declined their job offers and decided to attend Harvard. In college, he and some friends developed several projects, laying the foundation that led Facebook’s eventual start. Harvard administrators claimed these Web sites violated students’ privacy. He, however, had instant success launching Facebook from his dorm room, and the Web site’s popularity quickly spread to other Ivy League and Boston-area colleges and then worldwide. He left his studies at Harvard University in 2004 and moved to California.

Today, Zuckerberg says he spends the majority of his time running the $15 billion company on very little sleep.
Chapter Review

1. How Did the Internet Evolve? The Internet, also called the Net, is a worldwide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals. The Internet has its roots in ARPANET, a network started in 1969 to link scientific and academic researchers across the United States. In 1986, the National Science Foundation connected its huge network, called NSFnet, to ARPANET, creating a configuration of complex networks and hosts that became known as the Internet. Today, more than 550 million host computers connect to the Internet.

2. What Are the Various Types of Internet Connections, and What Are the Differences between Broadband and Dial-Up Connections? Many home and small business users opt to connect to the Internet via high-speed broadband Internet connections. DSL (digital subscriber line) provides Internet connections using regular copper telephone lines. Cable Internet service provides high-speed Internet access through the cable television network via a cable modem. Fiber to the Premises (FTTP) uses fiber-optic cable to provide high-speed Internet access. Fixed wireless provides high-speed Internet connections using a dish-shaped antenna to communicate via radio signals. A cellular radio network offers high-speed Internet connections to devices with built-in compatible technology or computers with wireless modems. A Wi-Fi network uses radio signals. Satellite Internet service provides high-speed Internet connections via satellite. Some homes and small businesses connect to the Internet with dial-up access. Dial-up access, which is slower-speed technology, takes place when the modem in your computer connects to the Internet via a standard telephone line that transmits data and information using an analog (continuous wave) pattern.

3. What Are the Types of Internet Access Providers? An access provider is a business that provides access to the Internet free or for a fee. An ISP (Internet service provider) is a regional or national access provider. An online service provider (OSP) provides Internet access in addition to members-only features. A wireless Internet service provider provides wireless Internet access to desktop and notebook computers and mobile devices with built-in wireless capabilities (such as Wi-Fi) or to computers using wireless modems or wireless access devices.

4. What Is the Purpose of an IP Address, and What Is Its Relationship to a Domain Name? An IP address (Internet Protocol address) is a number that uniquely identifies each computer or device connected to the Internet. The Internet relies on IP addresses to send data to computers at specific locations. The IP address usually consists of four groups of numbers, each separated by a period. A domain name is the text version of an IP address.

5. What Is the Purpose of a Web Browser, and What Are the Components of a Web Address? A Web browser, or browser, is application software that allows users to access and view Web pages or access Web 2.0 programs. With an Internet connection established, you start a Web browser, which then retrieves and displays a starting Web page, sometimes called a home page. The home page usually contains links to other Web pages. A link, short for hyperlink, is a built-in connection to another related Web page or part of a Web page. A Web page has a unique address called a URL (Uniform Resource Locator), or Web address. A Web address consists of a protocol, a domain name, and sometimes the path to a specific Web page or location on a Web page.

6. How Do You Use a Search Engine to Search for Information on the Web, and What Is the Difference between a Search Engine and a Subject Directory? A search engine is a program that finds Web sites, Web pages, images, videos, news, maps, and other information related to a specific topic. To use a search engine, you enter a word or phrase, called search text or a search query, that describes the item you want to find. Each word in the search text is known as a keyword. The search engine displays a list of hits. When clicked, each hit displays an associated Web site or Web page. A subject directory classifies Web pages in an organized set of categories and related subcategories. By clicking links, you move through levels to display a list of Web pages about a desired topic.
7. What Are the Types of Web Sites? A portal is a Web site that offers a variety of Internet services from a single location. A news Web site contains newsworthy material. An information Web site contains factual information. A business/marketing Web site promotes or sells products or services. A blog, short for Weblog, is an informal Web site consisting of time-stamped articles, or posts, in a diary or journal format, usually listed in reverse chronological order. A wiki is a collaborative Web site that allows users to create, add to, modify, or delete the Web site content via their Web browser. An online social network, or social networking Web site, encourages members to share their interests, ideas, stories, photos, music, and videos with other registered users. An educational Web site offers avenues for teaching and learning. An entertainment Web site provides an interactive and engaging environment. An advocacy Web site describes a cause, opinion, or idea. A Web application, or Web app, is a Web site that allows users to access and interact with software through a Web browser or any computer or device connected to the Internet. A content aggregator is a business that gathers and organizes Web content and then distributes, or feeds, the content to subscribers for free or a fee. A personal Web site is maintained by a private individual or family.

8. How Do Web Pages Use Graphics, Animation, Audio, Video, Virtual Reality, and Plug-Ins? Some Web pages use multimedia, which combines text with graphics, animation, audio, video, and/or virtual reality. A graphic is a digital representation of nontext information such as a drawing, chart, or photo. Animation is the appearance of motion created by displaying a series of still images in sequence. Audio includes music, speech, or any other sound. Video consists of full-motion images played back at various speeds. Virtual reality (VR) is the use of computers to simulate an environment that appears as three-dimensional space. A plug-in, or add-on, is a program that extends a browser’s capability to display multimedia elements.

9. What Are the Steps Required for Web Publishing? Web publishing is the development and maintenance of Web pages. The five major steps to Web publishing are: (1) plan a Web site, (2) analyze and design a Web site, (3) create a Web site, (4) deploy a Web site, and (5) maintain a Web site.

10. What Are the Types of E-Commerce? E-commerce, short for electronic commerce, is a business transaction that occurs over an electronic network such as the Internet. Business-to-consumer (B2C) e-commerce consists of the sale of goods and services to the general public. Consumer-to-consumer (C2C) e-commerce occurs when one consumer sells directly to another, such as in an online auction. Business-to-business (B2B) e-commerce takes place between businesses that exchange goods and services.

11. How Do E-Mail, Mailing Lists, Instant Messaging, Chat Rooms, VoIP, Newsgroups and Message Boards, and FTP Work? E-mail (short for electronic mail) is the transmission of messages and files via a computer network. A mailing list is a group of e-mail names and addresses given a single name, so that everyone on the list receives a message sent to the list. Instant messaging (IM) is a real-time Internet communications service that notifies you when one or more people are online. A chat room is an online area in which users have written discussions about a particular subject. A message board is a Web-based type of discussion group that is easier to use than a newsgroup. FTP (File Transfer Protocol) is an Internet standard that permits file uploading and downloading with other computers on the Internet.

12. What Are the Rules of Netiquette? Netiquette, which is short for Internet etiquette, is the code of acceptable behaviors users should follow while on the Internet. Netiquette rules include: keep messages short, be polite, avoid sending flames or spam, use emoticons and acronyms, clearly identify a spoiler, read the FAQ, do not assume material is accurate or up-to-date, and never read someone’s private e-mail.
# Key Terms

You should know the Primary Terms and be familiar with the Secondary Terms. The list below helps focus your study.

To see an example of and a definition for each term, and to access current and additional information from the Web, visit scsite.com/dc2011/ch2/terms.

## Primary Terms
(shown in bold-black characters in the chapter)

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## Secondary Terms
(shown in italic characters in the chapter)

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Checkpoint

The Checkpoint exercises test your knowledge of the chapter concepts. The page number containing the answer appears in parentheses after each exercise. The Beyond the Book exercises will help broaden your understanding of the concepts presented in this chapter.

To complete the Checkpoint exercises interactively, visit scsite.com/dc2011/ch2/check.

True/False  Mark T for True and F for False.

1. A single government agency owns and controls the Internet. (76)  
2. DSL provides high-speed Internet connections through the cable television network. (76)  
3. In general, the first portion of each IP address identifies the network and the last portion identifies the specific computer. (79)  
4. A Web 2.0 Web site can never allow users to modify Web site content. (81)  
5. A Web page has a unique address, called a URL or Web address. (82)  
6. Hypertext combines text-based links with graphic, audio, and video links. (83)  
7. The major disadvantage with a subject directory is that users have difficulty deciding which categories to choose as they work through the menus of links presented. (88)  
8. Most social networking Web sites include chat rooms, newsgroups, and other communications services. (90)  
9. Streaming disallows users from accessing and using a file while it is transmitting. (94)  
10. A plug-in is a program that extends the capability of an add-on. (97)  
11. Most e-commerce actually takes place between consumers, which is called consumer-to-consumer e-commerce. (100)  
12. Flames are abusive or insulting messages. (108)

Multiple Choice  Select the best answer.

1. _____ offers high-speed Internet connections to devices with built-in compatible technology or computers with wireless modems. (76)  
   a. Cable Internet service  
   b. A digital subscriber line  
   c. A cellular radio network  
   d. Fiber to the Premises (FTTP)  
2. As with an IP address, the components of a domain name are separated by _____. (79)  
   a. commas  
   b. periods  
   c. colons  
   d. semicolons  
3. _____ combines text-based links with graphic, audio, and video links. (83)  
   a. Hypertext  
   b. Multi-linking  
   c. Hypermedia  
   d. Tabbed browsing  
4. All of the following techniques can be used to improve Web searches except _____. (88)  
   a. put the most important terms last  
   b. read a search engine's Help information  
   c. list all possible spellings  
   d. if a search is unsuccessful, try another search engine
5. A _____ is a Web site that allows users to post short text updates, usually between 100 and 200 characters. (90)  
   a. microblog  
   b. wiki  
   c. portal  
   d. podcast  
6. A(n) _____ is a small version of a larger graphic. (94)  
   a. thumbnail  
   b. MP3  
   c. wiki  
   d. portal  
7. ____ is the process of transferring documents, graphics, and other objects from your computer to a server on the Internet. (107)  
   a. Downloading  
   b. Social networking  
   c. Uploading  
   d. Blogging  
8. ____ is the code of acceptable behaviors users should follow while on the Internet. (108)  
   a. Post Office Protocol  
   b. The Golden Rule  
   c. Netiquette  
   d. An FAQ
Chapter 2  The Internet and World Wide Web

Checkpoint  Match the terms with their definitions.

_____ 1. gTLD (80)  a. built-in connection to another related Web page or part of a Web page
_____ 2. ccTLD (80)  b. a two-letter country code for international Web sites outside the
_____ 3. DNS Server (80)  United States
_____ 4. IPv6 (80)  c. enables users to speak to other users over the Internet
_____ 5. link (82)  d. format that reduces an audio file to about one-tenth its original size
_____ 6. search engine (85)  e. new IP addressing scheme that may increase the number of available IP
_____ 7. MP3 (94)  addresses
_____ 8. player (94)  f. translates the domain name to its associated IP address
_____ 9. video (96)  g. software used to listen to an audio file on a computer
_____ 10. VoIP (106)  h. identifies the type of organization associated with a domain

i. program that finds Web sites, Web pages, images, videos, news, maps, and
other information related to a specific topic
j. full-motion images that are played back at various speeds

Short Answer  Write a brief answer to each of the following questions.

1. Describe three different types of broadband Internet services. __________ What is the difference between a
regional ISP and a national ISP? __________
2. How is a static Web page different from a dynamic Web page? __________ What is a Web site? __________
3. What is a Web application? __________ What are some features and examples of Web applications? __________
4. What are three types of specifications used by content aggregators to distribute content? __________ How might
you evaluate the accuracy of a Web site? __________
5. What is Web publishing? __________ What are the five major steps in Web publishing? __________

Beyond the Book  Follow the book element instructions below; then present your findings (brief report, presentation, discussion, or other means).

1. Ethics & Issues — Select an Ethics & Issues in this chapter (84, 87, 90, 100, 108), find a recent newspaper/
magazine article that supports one point of view presented, and then evaluate the article.
2. Computer Usage @ Work — Use the Web or a recent newspaper/magazine to locate three additional unique
usages of computer technology in the entertainment industry (109). What makes the use of these
technologies unique to the entertainment industry?
3. Companies on the Cutting Edge and Technology Trailblazers — Use the Web or a recent business
newspaper/magazine to locate an interesting fact about Google, eBay, Tim Berners-Lee, or Mark Zuckerberg
that was not presented in the chapter (111).
4. High-Tech Talk — Locate a recent newspaper/magazine article that discusses topics related to A Computer’s
Internet Protocol (IP) Address (110). Would you recommend the article you found? Why or why not?
5. FAQs and Web Links — Use the Web or a recent newspaper/magazine to locate three additional facts
about an FAQ (77, 78, 82, 88, 96, 99, 103, 105) and Web Link (76, 78, 82, 84, 96, 100, 103, 105, 107, 108) that were not presented in the chapter.
6. Looking Ahead — Use the Web or a recent newspaper/magazine to discover additional uses of the
technology presented in Web 3.0 to Reinvent the Virtual World (81).
7. Innovative Computing — Use the Web or a recent newspaper/magazine to locate two additional
interesting facts about View the Wonders of Space through the WorldWide Telescope (93) and Shopping
Becomes a Virtual Experience (100).
8. Making Use of the Web — Visit three of the Research Web Sites (126) and outline the information on each
Web site and the possible uses for each Web site.
**Learn It Online**

The Learn It Online exercises are interactive Web exercises designed to reinforce and expand your understanding of the chapter concepts. The descriptions below briefly summarize each exercise.

- **To access the Learn It Online exercises and for specific exercise instructions, visit scsite.com/dc2011/ch2/learn.**

1. **At the Movies — Tell Your Stories via Vlog**
   Watch a movie to learn about how to post your thoughts to a vlog and then answer questions about the movie.

2. **Video and Audio: You Review It — VoIP**
   Search for, choose, and write a review of a video, podcast, or vodcast that discusses Voice over IP.

3. **Student Edition Labs — Connecting to the Internet, Getting the Most out of the Internet, and E-mail**
   Enhance your understanding and knowledge about the Internet and e-mail by completing the Connecting to the Internet, Getting the Most out of the Internet, and E-mail Labs.

4. **Practice Test**
   Take a multiple choice test that checks your knowledge of the chapter concepts and review the resulting study guide.

5. **Who Wants To Be a Computer Genius 2?**
   Play the Shelly Cashman Series version of this popular game by answering questions to find out if you are a computer genius. Panic buttons are available to provide assistance during game play.

6. **Wheel of Terms**
   Identify important key terms presented in this chapter by playing the Shelly Cashman Series version of this popular game.

7. **DC Track and Field**
   Practice or compete against other students in three track and field events by answering multiple choice, true/false, and short answer questions related to concepts discussed in this chapter.

8. **You’re Hired!**
   Embark on the path to a career in computers by answering questions and solving puzzles related to concepts discussed in this chapter.

9. **Crossword Puzzle Challenge**
   Complete an interactive crossword puzzle to reinforce concepts presented in this chapter.

10. **Windows Exercises**
    Step through the Windows 7 exercises to learn about Internet properties, dial-up networking connections, and using Help to understand the Internet.

11. **Exploring Computer Careers**
    Read about a career as a Web developer, search for related employment advertisements, and then answer related questions.

12. **Web Apps — Windows Live Hotmail**
    Learn how to sign up for a free e-mail account, add a contact to your address book, and send an e-mail message.
Problem Solving @ Home

The Problem Solving @ Home exercises extend your knowledge of the chapter concepts by seeking solutions to practical computer problems that you may encounter at home or school. The Collaboration exercise should be completed with a team.

To discuss the Problem Solving @ Home exercises with other students, visit scsite.com/dc2011/ch2/forum and post your thoughts or questions.

In the real world, practical problems often can be solved in multiple ways. Provide one solution to each of the following problems using available resources, such as articles on the Web or in print, blogs, podcasts, videos, television, user guides, other individuals, and electronics and computer stores. You may need to use multiple resources to obtain an answer. Present your solutions in the form requested by your instructor (brief report, presentation, discussion, or other means).

1. **Page Not Displayed**  When you type the Web address of your favorite news Web site in the Address bar of the Web browser, you immediately see an error message stating that the Web page cannot be displayed. You did not have problems accessing the Internet yesterday. Before calling technical support, how will you attempt to troubleshoot the problem?

2. **Slow Internet Connection**  You just installed VoIP telephone service in your house. Each time you are on the telephone, however, you notice that your Internet connection slows down significantly. What could be causing this?

3. **No Wireless Connection**  When you return home to visit your parents and turn on your new notebook computer, it does not connect automatically to their wireless network. What is your next step?

4. **Eliminating Pop-Ups**  Each time you attempt to visit a Web site, many pop-up windows open on your computer. In fact, you sometimes close up to 10 windows that automatically appear. You used to browse the Web without this nuisance, but it is worsening by the day. What steps will you take to eliminate these pop-up windows?

5. **Incorrect Home Page**  After starting your Web browser, you notice that your home page has changed. You display the Internet Options dialog box to change your home page back to its previous setting, close your browser, and then start the browser again. Surprisingly, your Web browser still navigates to a Web site other than the one you chose. What is your next step?

6. **Images Not Being Displayed**  When you navigate to a Web page, you notice that no images are displaying. You successfully have viewed Web pages with images in the past and are not sure why images suddenly are not displayed. What steps will you take to view the images?

7. **Incorrect Search Engine**  A class project requires that you conduct research on the Web. After typing the Web address for Google’s home page and pressing the ENTER key, your Web browser redirects you to a different search engine. What could be wrong?

8. **Unsolicited Friend Requests**  You recently signed up for an account on the MySpace social networking Web site. When you log in periodically, you find that people you do not know are requesting to be your friend. How should you respond?

9. **New Browser Windows**  While browsing the Web, each time you click a link, the link’s destination opens in a new browser window. You prefer to have each link open in a new tab so that your taskbar does not become cluttered. How will you resolve this?

**Collaboration**

10. **Finding Trustworthy Sources**  Your history professor asked all of the students in her class to write a five-page paper about the Boston Tea Party. Instead of using books, you decide to find all of the relevant information you need on the Internet. After reading this chapter, you realize that not all Internet sources may be trustworthy, and that you must search the Internet for accurate Web sites. Form a team of three people and use various search engines to search for Web sites that discuss the Boston Tea Party. One team member should use the Google search engine, one team member should use the Yahoo! search engine, and one team member should use the Bing search engine. Which search engine displayed the most results overall? Which search engine returned the most relevant, trustworthy results? What search text did everyone use to narrow the search results to the most relevant Web sites? Did any of the search engines recommend alternate search text that might help to find relevant information?
Problem Solving @ Work

The Problem Solving @ Work exercises extend your knowledge of the chapter concepts by seeking solutions to practical computer problems that you may encounter at work. The Collaboration exercise should be completed with a team.

To discuss the Problem Solving @ Work exercises with other students, visit scsite.com/dc2011/ch2/forum and post your thoughts or questions.

In the real world, practical problems often can be solved in multiple ways. Provide one solution to each of the following problems using available resources, such as articles on the Web or in print, blogs, podcasts, videos, television, user guides, other individuals, and electronics and computer stores. You may need to use multiple resources to obtain an answer. Present your solutions in the form requested by your instructor (brief report, presentation, discussion, or other means).

1. **Plug-In Required**  Upon viewing a Web page, a message appears stating that you do not have the proper plug-in required to view the page's multimedia content. What is your next step?

2. **Blocked Instant Messenger**  Today, you started a new job. After setting up your new computer, you download your favorite IM (instant messaging) program successfully and without issue. After attempting to enter your user name and password, however, the program does not connect to the IM service. You are certain that your user name and password are correct, so what else might be causing this?

3. **Access Denied**  During your lunch hour, you decide to search the Web for possible vacation destinations. After visiting several airline and hotel Web sites, you attempt to visit the Web site for a Caribbean resort. Much to your surprise, the Web browser informs you that the Web site has been blocked. Why might this happen?

4. **Sporadic E-Mail Message Delivery**  The e-mail program on your computer has been delivering new messages only every hour, on the hour. Historically, new e-mail messages would arrive and be displayed immediately upon being sent by the sender. Furthermore, your coworkers claim that they sometimes do not receive your e-mail messages until hours after they are sent. What might be the problem?

5. **E-Mail Message Formatting**  A friend sent an e-mail message containing a photo to your e-mail account at work. Upon receiving the e-mail message, the photo does not display. You also notice that e-mail messages never display any formatting, such as different fonts, font sizes, and font colors. What might be causing this?

6. **Automatic Response**  When you return from vacation, a colleague informs you that when she sent e-mail messages to your e-mail address, she would not always receive your automatic response stating that you were out of the office. Why might your e-mail program not respond automatically to every e-mail message received?

7. **Suspicious Web Site Visits**  The director of your company's Information Technology department has sent you an e-mail message stating that you have been spending an excessive amount of time viewing Web sites not related to your job. You periodically visit Web sites not related to work, but only on breaks, which the company allows. How does he know your Web browsing habits? How will you respond to this claim?

8. **Wrong Web Site**  When attempting to visit your friend's Web site from your office computer, another Web site displays in its place. What might be wrong? What steps can you take so that you can visit his Web site?

Collaboration

9. **Computers in Entertainment**  The drama department at a local high school is considering developing a movie and has asked for your help. The drama teacher would like to incorporate technology wherever possible, in hopes that it would decrease the costs of the movie's production. Form a team of three people to help determine what technology can be used to assist in the movie's production. One team member should research the type of technology that can be used during the filming process. Another team member should research the types of hardware and software available for editing footage, and the third team member should research the hardware and software requirements for creating the media to distribute the finished product.
Learn How To

The Learn How To activities step you through fundamental technology skills when using a computer. The Learn How To exercises enable you to become more proficient with these skills.

Premium Activity: To relate this Learn How To activity to your everyday life, see a visual demonstration of the activity, and then complete a short assessment, visit scsite.com/dc2011/ch2/howto.

Learn How To 1: Attach a File to an E-Mail Message

When you send an e-mail message, it sometimes is necessary to attach a file to supplement the body of the e-mail message. Most e-mail programs allow you to attach a file to your e-mail messages easily, but many do not allow you to attach files exceeding a specified size limit (which varies by your e-mail service). You can attach a file to an e-mail message by completing the following steps:

1. Start your e-mail program and compose a new e-mail message to your recipient. Make sure that you have a descriptive subject and that you explain in the e-mail message that you are attaching a file.

2. To attach a file, locate and click the Attach File button or link. If you are unable to locate this button, you may find an icon with a picture of a paperclip or a menu command to attach a file. Some e-mail programs also may have a text box in the new message window with an adjacent Browse button. In this case, click the Browse button.

3. Locate and click the file you wish to attach and then click the Open (or Insert or Select) button (Figure 2-35).

4. Verify that your e-mail message contains the attachment and then click the Send button.

When the recipient opens the e-mail message, he or she also will be able to open the attachment.

Exercises

1. Start your e-mail program. Compose a new e-mail message to your instructor, and attach a file containing your current course schedule. Verify that your message has been received and then close your e-mail program.

2. Locate three free e-mail Web applications. How many file attachments do these e-mail programs allow you to attach to one e-mail message? Is a maximum file size specified for an e-mail attachment? Can you pay to upgrade your e-mail account so that these restrictions are lifted? Submit these answers to your instructor.

Learn How To 2: Search the Web for Driving Directions, Addresses, and Telephone Numbers

In addition to searching the Web for information using search engines such as Google and Yahoo!, some Web sites are designed specifically to search for other information such as driving directions, addresses, and telephone numbers.

Search for Driving Directions

1. Start your Web browser, type mapquest.com in the Address bar, press the ENTER key to display the MapQuest home page, and then click the Directions tab.

2. Type the starting address (or intersection), city, state, and ZIP code (if you know it) in the appropriate text boxes in the Starting Location area of the Directions page.

3. Type the ending address (or intersection), city, state, and ZIP code (if you know it) in the appropriate text boxes in the Ending Location area of the Directions page.

4. Click the Get Directions button to display the driving directions.

Search for the Address and Telephone Number of a Business

1. If necessary, start your Web browser. Type yellowpages.com in the Address bar, and then press the ENTER key to display the Yellow Pages Local Directory home page.

2. Type the name of the business in the Find text box, and type the city, state, and ZIP (if you know it) in the Location text box.

3. Click the FIND button to display the search results.

The Internet and World Wide Web

Chapter 2

Learn How To

Exercises

1. If necessary, start Internet Explorer by clicking the Start button, and then click Internet Explorer on the Start menu. Type mapquest.com in the Address bar, and then press the ENTER key. Search for driving directions between your address and the address of a friend or family member. How many miles are between the two addresses? How long would it take you to drive from your address to the other address? Write a paragraph explaining whether you would or would not use MapQuest to retrieve driving directions. Submit this paragraph to your instructor.

2. Use the Web to search for another Web site that provides driving directions. Use the Web site to search for directions between the same two locations from Exercise 1. Are the driving directions the same as the ones that MapQuest provided? If not, why might they be different? Which Web site did you use? Do you prefer this Web site to MapQuest? Why or why not? Write a paragraph with your answers and submit it to your instructor.

3. Think about a company for which you would like to work. In your Web browser, display the Yellow Pages Web page (yellowpages.com) and then search for the address and telephone number of this company. If Yellow Pages does not display the desired information, what other Web sites might you be able to use to search for the address and telephone number for a company?

Learn How To 3: Publish Your Resume on the Web

Publishing your resume on the Web is a great way to distribute your resume to multiple people. To publish your resume on the Web, complete the following steps:

1. Using Microsoft Word, create a new resume or open an existing resume that you wish to publish on the Web. When you have finished creating the resume, click the Office Button and then click Save As on the menu.

2. Click the Desktop button in the Save As dialog box, type resume in the File name text box, click Web page in the ‘Save as type’ list, and then click the Save button.

3. Quit Microsoft Word.

4. Start your Web browser and then type 50Webs.com in the Address bar. When the Web page is displayed, click one of the SIGN UP buttons (Figure 2-36).

5. Select the free Web hosting plan, click the ‘Use a subdomain’ option button, and then click the NEXT button.

6. Type the required information to sign up for the free plan. Make note of the subdomain you choose for your Web site. For example, if you type resume as your subdomain, your Web site address will be http://resume.50webs.com.

7. Click the check box to agree to the Terms and Conditions, and then click the Signup button. 50Webs will send your user name and password to the e-mail address you specified while signing up.

8. Click the Start button and then click Computer on the Start menu. In the Address bar, type \ftp:// subdomain.50webs.com (where subdomain should be replaced with your chosen subdomain from Step 6).

9. Type your user name and password in the Log On As dialog box, and then click the Log On button.

10. In your Web browser, type http:// subdomain.50webs.com/resume.htm (subdomain should be replaced with your chosen subdomain from Step 6).

Exercise

1. Use Microsoft Word to create a Web page that you would like others to see when they visit your new Web site. Include your name, e-mail address, and any other information that you would not object to making public. Save the file as a Web page using the file name, index.htm. Upload the file to the 50Webs.com Web server and then send the Web page address to your instructor.
Web Research

The Web Research exercises broaden your understanding of the chapter concepts by presenting questions that require you to search the Web for answers.

To discuss the Web Research exercises with other students, visit scsite.com/dc2011/ch2/forum and post your thoughts or questions.

1 Search Sleuth

Use one of the search engines listed in Figure 2-10 in Chapter 2 on page 85 or your own favorite search engine to find the answers to the following questions. Copy and paste the Web address from the Web page where you found the answer. Some questions may have more than one answer. If required, submit your answers to your instructor. (1) What were the title, date of publication, and purpose of the Internet Engineering Task Force’s RFC 1 document? (2) What is the mission of the World Wide Web Consortium (W3C)? (3) What topic does the film Adina’s Deck address? (4) What are the current figures on the Reporters Without Borders’ Press Freedom Barometer? (5) What was eBay’s original name, and what was the first item offered for auction? (6) Why did ConnectU sue Facebook in 2008 and 2004? (7) What is the cost to use Google’s 411 service?

2 Green Computing

EcoSearch is a search engine dedicated to supporting the Earth’s natural resources. Visit this Web site (ecosearch.org), use your word processing program to answer the following questions, and then, if required, submit your answers to your instructor. (1) From what company do the search results come? (2) Click the Learn More link on the page. What charities does EcoSearch support? (3) How can you get involved to help EcoSearch? (4) Click the EcoSearch Home link at the bottom of the page to return to the EcoSearch home page. In the text box, type ecosearch donate profits and then click the Search button. Click several of the resulting links and review the information. Write a 50-word summary of the information, including what percent of EcoSearch proceeds is donated to charities and how much money EcoSearch expects to donate each year.

3 Social Networking

MySpace is considered one of the pioneering Web sites that helped popularize the online social networking phenomenon. Calling itself “a place for friends,” it allows the millions of registered members to create profiles for free and then invite friends to join their networks. The growth of this Web site has helped it emerge as one of the more popular search engines. Visit the MySpace site (myspace.com), type the name of your favorite musical artist or group in the search text box, and then click the Search button. How many search results were found? Visit some of these profiles. Which music videos, playlists, and ringtones are featured? How do you create and edit your own playlists and add a song to your profile? Then click the Safety Tips link at the bottom of the page and read the guidelines for posting information and reporting inappropriate content. Summarize the music profiles you viewed and the guidelines. If required, submit your summary to your instructor.

4 Blogs

Many of the best blogs in the blogosphere have received awards for their content and design. For example, loyal blogging fans nominate and vote for their favorite blogs by visiting the Blogger’s Choice Awards Web site (bloggerschoiceawards.com). Visit this Web site, click the Best Blog Design, Best Blog About Blogging, and Best Education Blog links, and view some of the blogs receiving the largest number of votes. Then visit other award sites, including the Interactive Media Awards (interactivemediaawards.com), Bloggies (bloggies.com), and the Best of Blogs (thebestofblogs.com). Which blogs, if any, received multiple awards on the different Web sites? Who casts the votes? What criteria are used to judge these blogs?

5 Ethics in Action

Some Internet access providers have admitted they monitored their users’ Web surfing activities without giving notice of this eavesdropping practice. Embarq and Charter Communications secretly tested advertising technology to gather data about specific Web searches and then display advertisements relating to these searches. Privacy experts claim these Internet access providers’ practices violate federal privacy laws, including the wiretapping statute. Locate news articles discussing the Internet access providers’ Web eavesdropping. Then locate Web sites that oppose this practice. Summarize the views of the advertisers and the privacy proponents. If required, submit your summary to your instructor.
Critical Thinking

The Critical Thinking exercises challenge your assessment and decision-making skills by presenting real-world situations associated with the chapter concepts. The Collaboration exercise should be completed with a team.

To discuss the Critical Thinking exercises with other students, visit scsite.com/dc2011/ch2/forum and post your thoughts or questions.

To evaluate the situations below, use personal experiences and available resources such as articles on the Web or in print, blogs, podcasts, videos, television, user guides, other individuals, and electronics and computer stores. You may need to use multiple resources to form conclusions and make recommendations.

1. **Class Discussion — Browser Comparison**
   Although Internet Explorer may be the most widely used Web browser, it is not the only Web browser in use. Evaluate and compare reviews of other Web browsers such as Google Chrome, Safari, or Firefox with Internet Explorer. Discuss the major differences between the browsers you researched and Internet Explorer. Examples of differences might include the number and types of features, how they display Web pages, and the speed at which they perform. Include in your discussion which browser you would recommend and the reasons for your recommendation.

2. **Class Presentation — Brick-and-Click Businesses**
   Many retailers, such as Best Buy, Barnes and Noble, and Toys R Us, are brick-and-click businesses. That is, they allow customers to conduct complete transactions at a physical location as well as online at a Web site. Choose a local brick-and-click business in which you have shopped at the physical location and then visit the Web site of the same business. Compare the type, availability, and cost (include tax and shipping) of products or services available. Analyze the advantages and disadvantages of dealing with the physical location versus the Web site of a brick-and-click business and then present your recommendation of whether you would rather shop at the physical location or at the Web site. Note the factors that influenced your decision. Next, locate a company that only conducts business online, but sells the same products as the brick-and-click business. How do the prices compare? Would you prefer to shop using this Web site instead?

3. **Research — Acceptable Use Policy**
   Most schools and businesses provide free Internet access to students and employees while they are at school or at work. While the school’s or business’s intention is for the Internet to be used for academic or work-related purposes, employees and students often find it easy to become involved with other activities on the Internet not related to their job or academics, which can degrade Internet access for others, or lead to poor job performance. For these reasons, many schools and businesses create an Acceptable Use Policy that outlines how students and employees should use the Internet. It also may outline consequences for unauthorized Internet use. Locate two Acceptable Use Policies that are published online. Compare these two policies, find two additional Acceptable Use Policies online, and then create a policy you believe would be fair to employees of a small business. Be sure to include guidelines for Internet use during breaks, use of IM programs, and the use of Web sites that are not related to their job.

Collaboration

4. **Web Site Evaluation**
   You are vice president of operations for a major luxury hotel chain. You and three teammates want to start a new chain of discount hotels called Sleepy Hollow. You have made a plan that includes opening hotels initially in Seattle, Kansas City, Nashville, and Dallas. You plan to offer comfortable rooms, wireless Internet access, a business center, and a hot breakfast buffet. Besides offering reservations over the telephone, you want to develop a Web site that will allow customers to negotiate a nightly rate as their check-in time approaches. With your teammates, evaluate existing major hotel Web sites by listing the advantages and disadvantages of each. Assign each member the task of evaluating two of the following hotel chains: Marriott, Hilton, Holiday Inn, Ramada, Super 8, Motel 6, Days Inn, and Radisson. Team members should print the home page of the hotel chain to which they are assigned and evaluate their respective hotels’ Web sites, paying particular attention to the following areas: (1) design of the Web site, (2) ease of use, (3) reservations, (4) awards programs, (5) special offers, (6) online Help, (7) information about the hotel, and (8) contact information for the hotel. Prepare a report and/or presentation summarizing your evaluations and ranking the sites in terms of their effectiveness. Be sure to include brief explanations supporting your rankings.