Chapter 2

The Internet & the World Wide Web: Exploring Cyberspace

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Brief Chapter Outline

Section 2.1 – Connecting to the Internet: Narrowband, Broadband, & Access Providers

This section discusses both wired and wireless means of connecting to the Internet.

Section 2.2 – How Does the Internet Work?

This section covers the basic structure of the Internet and who controls it.

Section 2.3 – The World Wide Web

This section discusses the various components of the web and how they work.

Section 2.4 – Email & Other Ways of Communicating over the Net

This section focuses on email & webmail, as well as instant messaging, FTP, newsgroups, and other ways of communication over the Internet.

Section 2.5 – The Online Gold Mine: Telephony, Multimedia, Webcasting, Blogs, E-Commerce, & Social Networking

This section discusses many of the activities and services offered by the Internet and the web.

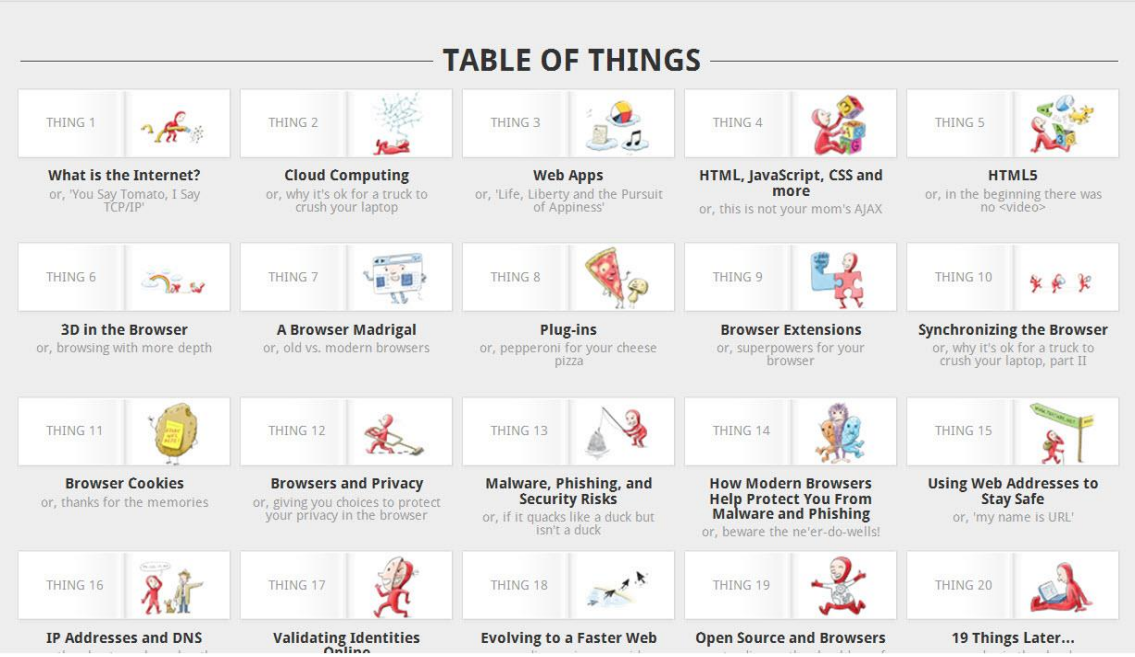
Section 2.6 - The Intrusive Internet: Snooping, Spamming, Spoofing, Phishing, Pharming, Cookies, & Spyware

This section covers the problems and dangers associated with using the Internet and the web.

Teaching Tip: Ask Students for Questions & Concerns & Make Lists

Ask students for questions and concerns about the Internet and the web at the beginning of the class and compile a list of these questions to refer to. Answer all the questions during the class and check them off the list once they have been answered. Make a new list at the beginning of each new chapter.

Also, for many topics in this chapter, check out Google Chrome's *Table of Things*, www.20thingsilearned.com/en-US/table-of-things



Lecture Outline

2.1. CONNECTING TO THE INTERNET: NARROWBAND, BROADBAND, & ACCESS PROVIDERS

***Key Question*:** What are the means of connecting to the Internet, and how fast are they? What are three kinds of Internet provider?

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Introductory Information

- A Short History of the Internet

The basis for the Internet began in 1969 as ARPANET for the Advanced Research Projects Agency (ARPA) for the U.S. Department of Defense. It started with four linked-

together computers. From there, the network expanded to 62 (hosts) computers in 1974, 500 computers in 1983, and 100,000 in 1989. Now there are hundreds of millions.

In the early 1990s the World Wide Web was developed, which made multimedia possible on the Internet.

- What's Needed to Connect to the Internet

To connect to the Internet, you need three things:

1. An access device: An example of an access device is a computer with a modem.
2. A means of connection: Examples of connections are telephone line, cable hookup, or wireless capability.
3. An Internet access provider: Examples of Internet access providers are Internet service provider (ISP), a commercial online service provider, or a wireless Internet service provider.

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- Definitions of Bandwidth

  Connections to the Internet are expressed in terms of bandwidth.

  —Bandwidth: ***Bandwidth***, or *channel capacity*, is an expression of how much data—text, voice, video, and so on—can be sent through a communications channel in a given amount of time.

  —Baseband: ***Baseband transmission*** is a slow type of connection, allowing only one signal at a time to be transmitted.

  —Broadband: ***Broadband transmissions*** are very high-speed connections that carry more than one signal at a time (as through coaxial or fiber-optic cable).

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- The Physical Connection: Wired or Wireless?

  The principal wired or wireless means of connecting to the Internet:

1. Telephone (dial-up) modem (used mostly in rural areas)
2. High-speed phone lines—DSL or T1/T3
3. Cable modem
4. Satellite and other wireless links

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- Data Transmission Speeds

  Data is transmitted in characters or collections of bits. A ***bit*** is the smallest unit of data/information used by computers.

  Today's data transmission speeds usually are measured in bits, kilobits, megabits, and gigabits per second.

  —bps: ***bps*** stands for ***bits per second***. (8 bits equals 1 character, such as A, 3, or !) A computer with an old modem might have a speed of 28,800 bps per second.

  —Kbps: ***Kbps*** stands for ***kilobits per second***, or 1,000 bits per second. The speed of a modem that is 56,000 bps might be expressed as 56 Kbps.

  —Mbps: ***Mbps*** stands for ***megabits per second***—1 million bits per second.

  —Gbps: ***Gbps*** stands for ***gigabits per second***—1 billion bits per second.

- Uploading & Downloading

  The number of bits per second affects how fast you can upload and download data from a remote computer.

  —Upload: ***Upload*** means to transmit data from a local computer to a remote computer.

  —Download: ***Download*** means to transmit data from a remote computer to a local computer.

  Most people use the term *upload* when they are sending a file over the Internet and *download* when they are receiving a file over the Internet.

Additional Information: What Is "Sideloading"?

The act of transferring a file from one web server to another, while technically a simultaneous download and upload, is often called *sideloading*.

Web Exercise: Find Different Ways to Access the Internet

These websites give information on different methods to access the Internet:

www.gibson.vero-beach.fl.us/classes/Internet/access.html
www.conniq.com/InternetAccess_others.htm

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A. Narrowband (Dial-Up Modem): Low Speed but Inexpensive

The telephone line is still the cheapest and most widely available means of Internet connection. Unlike broadband connections (coaxial and fiber-optic cables), the telephone line is a ***narrowband,*** or low-bandwidth, connection. This technology mainly consists of ***dial-up connections***—use of telephone modems to connect computers to the Internet. (One cannot talk on the phone and transmit data at the same time, on a dial-up modem.)

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- Connecting the Modem: A ***modem*** is a device that sends and receives data over communication lines to and from computers. Most modems are internal (inside the computer), but there are also external modems. The dial-up modem is attached to the telephone wall outlet. Standard telephone (dial-up) modems have a maximum speed of 56 Kbps.

Additional Information: What's an "Analog Modem"?

Telephone modems are often called *analog modems* to differentiate them from high-speed DSL and cable modems. Essentially, analog modems speeds are limited to 56 Kbps because of the nature of telephone lines and the "noise" that occurs on them. Users' modems work with the modems of their Internet access provider, the regional, national, or wireless organization or business that connects them to the Internet.

NOTE: Conversion from analog to digital—and the definitions of these terms—are covered in Chapter 6.

B. High-Speed Phone Lines: More Expensive but Available in Most Cities

The regular phone system is called ***POTS***, for "plain old telephone system." Faster but more expensive connections are available in most cities. Among the choices are DSL, cable, and T1/T3.

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- DSL Line: ***DSL*** (for *digital subscriber line*) uses regular phone lines, a DSL modem, and special technology to transmit data in megabits per second. DSL receives and sends data at different rates. It receives data at 1.5 to 10 Mbps, but it sends data at only 128 Kbps to 1.5 Mbps. (You can talk on the phone and send data at the same time.)

  One drawback is you have to live within 4.5 miles of a phone company central switching office, because the access speed and reliability degrade with distance. (DSL is not available in many rural areas.)

- T1 Line: A ***T1 line*** is a traditional trunk line that carries 24 normal telephone circuits. T1 lines have a transmission rate of 1.5–6 Mbps. (T2 and T3 lines are even faster.) Such lines are very expensive and so are normally used by businesses connecting to the Internet as well as Internet access providers.

C. The "Last Mile"

www.webopedia.com/TERM/L/last_mile.html
www.translation-please.com/dictionarymeaning.cfm?dictionaryid=214

D. Cable Modem: Close Competitor to DSL

A cable modem connects a personal computer to a cable-TV system that offers an Internet connection. Cable modems can send outgoing data at up to 1.4 Mbps and receive incoming data at up to 30 Mbps.

- "Always On": Like a DSL connection, a cable-modem connection is ***always on.*** Unlike DSL, you don't need to live near a phone company switching station.

- Approximate Comparison of Connection Speeds

  One way to get a sense of the general speeds of these connections is to consider how long each takes to download a 6-minute video:

  —A 28.8 Kbps telephone modem takes 4¾ hours to download a 6-minute video

  —DSL line—11 minutes

  —Cable modem—2 minutes

  —T1 line—instantaneously

Additional Information: More about "Always On" Connections

For more information about always-on connections, go to:

http://forums.techsoup.org/cs/community/f/14/t/43.aspx

Group Exercise: What Services & Products Does the Internet Provide Us with Today?

Ask students to list all the services and products they can think of that are available today because of the Internet. Examples:

Email
Automated bill payment
Chat rooms
E-commerce
Online shopping
Downloaded music and movies
Books online
Education courses online
Newspapers online
Magazines online
Phone calls via Internet
Stock purchasing/investing

Games
Auctions
????

Group Exercise: What Are Common Applications of T1/T3 Lines?

Ask students to search the web and find information on how T1, T2, and T3 lines are used.

Additional Information: More about Speeding Up Modem Connections

Get information about speeding up modem connections at the following websites:

www.cbs-soft.com/speedconnect.htm
www.sharewareconnection.com/modem-optimizer.htm

The following website discusses "tweaking" your computer system for broadband connections:

www.dslreports.com/tweaks

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E. Satellite Wireless Connections

A ***communications satellite*** is a space station that transmits radio waves called *microwaves* from earth-based stations. With a pizza-size satellite dish on the roof or side of your house, you can send data at around 200–512 Kbps and receive data at about 1–2 Mbps. (A satellite Internet connection is always on.)

This kind of connection requires you get an Internet access provider that provides two-way satellite transmission.(Because of satellite transmission's signal delay [*latency* or *lag time*] of 500–900 milliseconds, it is generally unsuitable for real-time applications, such as games, and can make some phone conversations difficult.) (A dial-up connection involves about only 150–200 ms latency.)

F. Other Wireless Connections: Wi-Fi, 3G, & 4G

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Cellphone users and others access the Internet through ***wireless networks***, which use radio waves to transmit data.

- Wi-Fi: ***Wi-Fi***, which stands for ***Wireless Fidelity***, is the name given to any of several standards—so-called 802.11 standards—set by the Institute of Electrical and Electronic Engineers (IEEE) for wireless transmission.

Comparison of Wi-Fi 802.11 Standards: ***802.11a, 802.11b, 802.11g, 802.11n***

http://compnetworking.about.com/cs/wireless80211/a/aa80211standard.htm

—Access point or hotspot: An ***access point***, or ***hotspot***, is a station that sends and receives data to and from a Wi-Fi network. Many airports, hotels, libraries, convention centers, and fast-food facilities offer hotspots, public access to Wi-Fi networks. The hotspot can get its Internet access from DSL, cable modem, T1 local area network, dial-up phone service, or any other method. It can then broadcast data wirelessly—for example, to a laptop computer equipped with Wi-Fi hardware (for 300–500 feet).

- 3G Wireless: ***3G,*** which stands for *third generation*, is loosely defined as high-speed wireless technology that does not need access points because it uses the existing cellphone system. This technology, which is found in many tablet PCs, smartphones (Internet-enabled cellphones that run applications, or apps), and PDAs that are capable of delivering downloadable video clips and high-resolution games, is being provided by AT&T, Sprint, Verizon, T-Mobile, and others.
- 4G Wireless: ***4G***, which stands for *fourth generation*, is a successor to 3G and 2G standards, with the aim to provide a wide range of data rates up to ultra-broadband (gigabit-speed) Internet access to mobile as well as stationary users. Neither standards bodies nor service carriers have yet concretely defined or agreed on what exactly 4G will be.

More Information on 4G:

www.cnn.com/2010/TECH/03/23/cnet.4g.wireless.clearwire/index.html
http://money.cnn.com/2010/12/01/technology/4g_myth/index.htm
http://searchmobilecomputing.techtarget.com/definition/4G
www.networkworld.com/news/2007/052107-special-focus-4g.html

G. Internet Access Providers: Three Kinds

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Besides having an access device and means of connection, to get on the Internet you need to go through an Internet access provider. There are three such types:

- Internet Service Providers: An ***Internet service provider*** (***ISP***) is a local, regional, or national organization that provides access to the Internet for a fee.
- Commercial Online Services: A ***commercial online service*** is a members-only company (such as AOL and MSN) that provides not only Internet access but other specialized content as well, such as news, games, and financial data.
- Wireless Internet Service Providers: A ***wireless Internet service provider*** (***WISP***)—such as Cingular, Sprint, T-Mobile, and Verizon—enables users with computers containing wireless modems (mostly laptops/notebooks/tablets) and web-enabled smartphones to gain access to the Internet.

2.2 HOW DOES THE INTERNET WORK?

 ***Key Question:*** What is the basic structure of the Internet, and who controls it?

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The Internet consists of hundreds of thousands of smaller networks connected around the globe. Central to this arrangement is the ***client/server network***.

- A ***client*** computer is a computer requesting data or services.
- A ***server***, or host computer, is a central computer supplying data or services requested of it.

A. Internet Connections: POPs, IXPs, Backbone, & Internet2

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The first step in connecting to the Internet starts with your computer's or wireless device's modem (the client computer) connecting to your Internet service provider's (ISP's) server, which may be located almost anywhere.

- Point of Presence: To avoid making its customers pay long-distance phone charges to connect, the ISP provides each customer with a ***point of presence***, a local gateway to the ISP's network (collections of modems and other equipment in a local area called a *point-of-presence* [*POP*]. The POP acts as a local gateway to the ISP's network.
- Internet Exchange Point: The ISP in turn connects to an ***Internet Exchange Point*** (***IXP***), a routing computer at a point on the Internet where several connections come together.

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- Internet Backbone: IXPs are connected by the equivalent of interstate highways known collectively as the ***Internet backbone***. The Internet backbone consists of high-speed, high-capacity transmission lines. There are a number of major Internet backbone providers, including AT&T, Sprint, and Verizon.
- Internet2: ***Internet2*** is a cooperative university/business education and research project that enables high-end users to quickly and reliably move huge amounts of data over high-speed networks. In effect, Internet2 adds "toll lanes" to the older Internet to speed things up. The purpose is to advance videoconferencing, research, and collaboration—to enable a kind of "virtual university."

B. Internet Communications: Protocols, Packets, & Addresses

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What happens when your modem connects to a modem at your ISP's POP location?

- Handshaking: The two modems go through a process called ***handshaking***, whereby the fastest available transmission speed is established.
- Authentication: Then ***authentication*** occurs—your use of the correct password and user name (which you established when you set up the ISP account) tell the ISP you are who you say you are.

How the Internet communicates your messages:

1. Protocols: How do computers understand the data being transmitted? The key lies in data following the same protocol. ***Protocols*** are sets of rules that computers must follow to transmit data electronically. The protocol that enables all computers to use data transmitted on the Internet is called ***TCP/IP***, for ***Transmission Control Protocol/Internet Protocol***.

   TCP/IP was developed in 1978 by ARPA and is used for all Internet transactions, from sending email to downloading pictures. TCP/IP indicates when the sending device has finished sending a message. It also indicates when the receiving device has received the message.

Additional Information: What Protocols Do

Most protocols specify one or more of these:

- Detection of the underlying physical connection (wired or wireless), or the existence of the other endpoint or node
- Handshaking (signals transmitted back and forth over a communications network that establish a valid connection between two stations)
- Negotiation of various connection characteristics
- How to start and end a message
- How to format a message
- What to do with corrupted or improperly formatted messages (error correction)
- How to detect unexpected loss of the connection, and what to do next
- Termination of the session or connection

Also:
http://searchunifiedcommunications.techtarget.com/definition/Internet-Protocol
http://computer.howstuffworks.com/internet/basics/internet-infrastructure5.htm

2. Packets: TCP/IP breaks the data in a message into separate packets. ***Packets*** are fixed-length blocks of data for transmission. This allows a message to be split up and its parts to be sent by separate routes, yet they still all wind up in the same place.

   IP is used to send the packets across the Internet to their final destination. TCP is used to reassemble the packets in the correct order.

   Packets do not have to follows the same network routes to reach their destination because all the packets have the same IP address.

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3. IP Addresses: Every device connected to the Internet has an address. An ***Internet Protocol*** (***IP***) ***address*** uniquely identifies every computer and device connected to the Internet. An address consists of four sets of numbers between 0 and 255 separated by periods. An example of an IP address would be: 95.160.10.240.
    - Dynamic IP address: Each time you connect to your Internet access provider, it assigns your computer a new IP address, called a ***dynamic IP address***, for your online session. When you're finished and disconnect, the provider assigns the IP address to another user.
    - Static IP address: Unlike a dynamic IP address, a ***static IP address*** remains constant each time you log on to the Internet. Established organizational websites, such as your ISP's, have static IP addresses, as do many companies.

Additional Information: Finding Your IP Address While Online

Want to find out what your IP address is while you're online? Go to:

www.formyip.com

C. ICANN: Who Runs the Internet?

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1. ISOC: No one owns the Internet, but everyone on the net adheres to standards overseen by the board of trustees of ***ISOC***, short for the ***Internet Society***. ISOC is a professional, nonprofit society with more than 100 organizational and 44,000 individual members in more than 80 chapters around the world. The organizations include companies, governments, and foundations.
2. ICANN: The ***Internet Corporation for Assigned Names and Num***bers (***ICANN***) was established in 1998 to regulate human-friendly Internet domain names. Domain names include addresses, such as those ending with .com, .org, and .net, that overlie IP addresses and identify the website type.

    ICANN is global, private-sector, nonprofit corporation that has no statutory authority and imposes policies through contracts with its world members.

Additional Information: The Internet Traffic Report

The Internet Traffic Report monitors the flow of data around the world. It displays values between 0 and 100 for many networks. Higher values indicate faster and more reliable connections. Check out your area at:

www.Internettrafficreport.com/main.htm

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2.3 THE WORLD WIDE WEB

***Key Question*:** How do these work: websites, web pages, browsers, URLs, web portals, search tools, and search engines? What are HTML and hyperlinks?

A. The Face of the Web: Browsers, Websites, & Web Pages

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The Internet and the World Wide Web are not the same. The World Wide Web is the multimedia part of the Internet. It began in 1989 when British computer scientist Tim Berners-Lee developed the underlying software. Later he designed and built the first browser.

Three important aspects of the Web are browsers, websites, and web pages.

1. Browsers—Software for Surfing the Web: A ***browser***, or web browser, is software that enables people to find and access the various parts of the web—to surf the Web. *Surf* means to explore the web by using your mouse to move via a series of connected paths, or links, from one location, or website, to another.

   Two well-known browsers are Microsoft Internet Explorer and Mozilla Firefox. Others are Apple's Safari, Google's Chrome, and Microsoft's Bing.
2. Website—The Location on the Computer: A ***website***, or simply ***site***, is a location on a particular computer (server) on the web that has a unique address. An example of a website (called a URL) is www.mcgraw-hill.com.

   The website is the location of a computer somewhere on the Internet, not necessarily in the offices of the organization using it.

Additional Information: Is "Website" a Lowercase Word?

The transition from World Wide Web site to Web site to website has progressed as rapidly as the technology itself. The development of website as a single lowercase word mirrors the development of other technological expressions which have tended to evolve into unhyphenated forms as they become more familiar. Thus email has recently been gaining ground over the forms E-mail and e-mail, especially in texts that are more technologically oriented. Similarly, there has been an increasing preference for closed forms like homepage, online, and printout. [From *Answers.com*]

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3. Web Pages—The Documents on a Website: A ***website*** is composed of a web page or collection of web pages. A web page is a document on the World Wide Web that can include text, pictures, sound, and video. The first page on a website is the ***home page,*** or welcome page, which identifies the website and contains links to other pages on the site.

B. How the Browser Finds Things: URLs

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Browsers use URLs to find particular web pages.

1. URLs: Addresses for Web Pages: The ***URL*** (***Uniform Resource Locator***) is a string of characters that points to a specific piece of information anywhere on the web. A URL consists of the following components:

    - *The web protocol: http://*
      http:// stands for ***HyperText Transfer Protocol***, the communications rules that allow browsers to connect with web servers. (Note that the protocol designation http:// is now often omitted from URLs, because the web protocol is assumed. Do not omit it, however, if www. is not part of the URL or if special security is being used [e.g., https://]).
    - *The domain name (web server name)*
      A ***domain*** is simply a location on the Internet, the particular web server. Domain names tell the location and the type of address.

Example: www.nps.gov (the website for the National Park Service)

Domain-name components are separated by periods, called "dots." The last part of the domain is a three-letter extension that describes the domain type: for example, .gov, .com, .net, .edu, .org, .mil, .int—government, commercial, network, educational, nonprofit, military, or international organization.

Some domain names include country designations, such as .us (USA), .ca (Canada), .de (Germany)

- *The directory name*
  The ***directory name*** is the name of the file on the server from which the browser pulls the file.
  Example: "yose" in www.nps.gov/yose (for Yosemite National Park)
- *The file name (or filename) and extension:*
  File within that directory and extension (planyourvisit/index.htm).
  Example: http://www.nps.gov/yose/planyourvisit/index.htm
  The file name refers to the file sought by the user; the extension identifies the type of file. (Extensions are not always used.)

2. URLs & Email Addresses: Not the Same: *A URL is not the same as an email address.* Email addresses use the @ symbol and identify mailbox locations on a server, not websites.

C. The Nuts & Bolts of the Web: HTML & Hyperlinks

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The basic communications protocol that makes the Internet work, as we described, is TCP/IP. And the communications protocol used to access that part of the Internet called the World Wide Web is called ***HyperText Transfer Protocol*** (***HTTP***).

A hypertext document uses hypertext markup language (HTML), which uses hypertext links, to connect with other documents. The foundations of the Web, then, are HTML and hypertext links.

1. Hypertext Markup Language (HTML): HTML is the language used in writing and publishing web pages. ***Hypertext markup language*** (***HTML***) is the set of special instructions (called "tags" or "markups") that are used to specify document structure, formatting, and links to other multimedia documents on the web.

Extensible hypertext markup language (XHTML) is a successor to HTML.

2. Hypertext Links: ***Hypertext links*** (hyperlinks) are connections to other documents or web pages that contain related information. A word or phrase in one document becomes a connection to a document in a different place. Hyperlinks appear as underlined or colored words or phrases. When clicked on, they link the user to other web pages.

Additional Information: Hypertext and Hypergraphics

The hypertext concept was originally coined by Ted Nelson in the mid-1960s as a method for making the computer respond to the way humans think and require information. Icons and graphic elements of all sizes and shapes can also serve as clickable links but are more accurately called *hypergraphics*. Thus, hyperlinks are technically either hypertext or hypergraphics. In practice, the terms *hypertext* and *hyperlink* are mostly used, and often synonymously.

D. Using Your Browser to Get around the Web

You can find all kinds of things on the web, but it takes a browser and various kinds of search tools to help you get around.

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1. Basic Elements of the Browser: The basic elements of a browser are *menu bar*, *toolbar, address (URL bar), workspace,* and *status bar*. Clicking the mouse on parts of these elements will produce pull-down menus of other options.

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2. Starting Out from Home—The Home Page: The ***home page*** (start page) is the first page you see when starting up a browser. You can change the home page on your browser, choosing any page on the web to be your home page. A good home page offers links to sites frequently visited. Often the Internet access provider will provide its own home page. (You can personalize your home page—for example, by putting on the weather forecast, news, or a reminder page.)

3. Getting Around—Back, Forward, Home, & Search Features: The browser toolbar provides navigational aids.
   Back takes you back to the previous page.
   Forward lets you look again at a page you returned from.
   Clicking on Home returns you to your home page, where you can start over again.
   Search displays a directory of search engine sites.

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4. History Lists: The browser also has navigation aids. The ***history list*** allows you to quickly return to the pages you have recently visited.

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5. Favorites or Bookmarks: ***Favorites*** or ***Bookmarks*** let you store the URLs of web pages you frequently visit, so you can easily find them again. To save the URL for a site, click on "Favorites" in Internet Explorer or "Bookmarks" in Mozilla Firefox.

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6. Interactivity: Hyperlinks, Radio Buttons, & Text Boxes: For any given web page, there are three possible ways to interact with it:
   Click on the hyperlink, which will transfer you.
   Click on the radio button.
   Type text in the text (search) box.

7. Scrolling & Frames: Two other navigation aids are scroll arrows and frames.
   - Scroll arrows: Clicking on the ***scroll arrows***—small up/down and left/right arrows to the bottom and side of your screen allows you to move the screen so that you can see the rest of the web page. This movement is known as scrolling.
   - Frames: Some web pages are divided into different rectangles known as ***frames***, each with its own scroll arrows. A frame is an independently controllable section of a web page.

Additional Information: Frame as Data Structure

A frame is a data structure invented by Marvin Minsky in the 1970s. It refers to the physical layout of data. Data fields, memo fields, fixed length fields, variable length fields, records, word processing documents, spreadsheets, data files, database files and indexes are all examples of data structures.

E. Web Portals: Starting Points for Finding Information

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Web portals are kind of like "guidebooks" for finding information on the Internet.

1. Types of Web Portals: A ***web portal***, or simply ***portal***, is a type of gateway website that functions as an "anchor site" and offers a broad array of resources and services.

   Examples of services are online shopping malls, email support, community forums, current news and weather, stock quotes, travel information, and links to other popular subject categories.

   Examples of portals are Yahoo!, Google, Bing (formerly MSN), Lycos, and AOL. Wireless portals (such as Yahoo! Mobile) are designed for web-enabled portable devices.

2. Logging On to a Portal—When logging on to a portal you can:
   —Check the portal's home page for general information (to get news headings, sports scores, etc.)
   —Use the subject guide to find a topic (under headings such as "Business" or "Entertainment")
   —Use a search box and keywords to search for a topic. A ***keyword*** is the subject word (or words) of the topic you wish to find (such as "Steve Jobs," if you want info on the founder of Apple Computer).

F. Search Services & Search Engines, & How They Work

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Search services and search engines are two different things.

1. Search Services: ***Search services*** are organizations that maintain databases accessible through websites to help users find information on the Internet.

Examples: Parts of portals such as Yahoo! and Bing, plus Google, Ask.com, and Gigablast.

2. Search Engines: Search services maintain ***search engines***, programs that enable users to ask questions or use keywords to locate information on the web. Search services compile their databases by using special programs called ***spiders*** (also known as ***crawlers, bots, agents***) that "crawl" through the web, following links from one web page to another and indexing the words on that site.

This method of gathering information has two important implications:

1. A Search Never Covers the Entire Web: A single search engine does not cover the entire web, only a portion of it. In addition, a lot of databases have material that is not publicly available.

   A lot of material from the 1970s and earlier has never been scanned into databases.

2. Search Engines Differ in What They Cover: Search engines list their results according to some kind of relevance ranking, and different search engines use different ranking schemes. (Some rank items according to popularity, but others don't.)

Additional Information: A Short History of Search Engines

The first web search engine was Wandex, a now-defunct index collected by the World Wide Web Wanderer, a web crawler developed by Matthew Gray at MIT in 1993. Another very early search engine, Aliweb, also appeared in 1993. One of the first engines to later become a major commercial endeavor was Lycos, which started at Carnegie Mellon University as a research project in 1994.

Soon after, many search engines appeared and vied for popularity. These included WebCrawler, Hotbot, Excite, Infoseek, Inktomi, Open Text, Northern Light, and AltaVista.

In 2002 Yahoo! acquired Inktomi, and in 2003 Yahoo! acquired Overture, which owned AlltheWeb and Altavista. In 2004 Yahoo! launched its own search engine based on the combined technologies of its acquisitions and providing a service that gave pre-eminence to the web search engine over the directory.

Before the advent of the web, there were search engines for other protocols or uses, such as the Archie search engine for anonymous FTP sites and the Veronica search engine for the Gopher protocol.

Osmar R. Zaïane's *From Resource Discovery to Knowledge Discovery on the Internet* details the history of search engine technology before the emergence of Google:

http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.51.3177
http://aaaipress.org/Papers/KDD/1995/KDD95-039.pdf

Around 2001 the Google search engine rose to prominence. Its success was based in part on the concept of link popularity and PageRank. How many other web sites and web pages link to a given page is taken into consideration with PageRank, on the premise that good or desirable pages are linked to more than others.

How does PageRank work?

www.webworkshop.net/pagerank.html
www.prchecker.info/check_page_rank.php
www.google.com/about/corporate/company/tech.html

F. Four Web Search Tools: Individual Search Engines, Subject Directories, Metasearch Engines, & Specialized Search Engines

[PowerPoint 2-34 here]

There are many types of search tools, but the most popular versions are individual search engines, subject directories, metasearch engines, and specialized search engines.

1. Individual Search Engines: An ***individual search engine*** compiles its own searchable database on the web. You search for information by typing one or more keywords, and the search engine then displays a list of web pages, or ***hits***, that contain these keywords, ordered from the most likely to least likely to contain the information you want. (Hits are defined as sites that a search engine returns after running a keyword search.)

   Examples of this kind of search engine are: Ask, Bing, and Yahoo!.

2. Subject Directories: ***A subject directory*** is created and maintained by human editors, not electronic spiders. A subject directory allows the user to search by selecting lists of categories or topics.

   Examples of subject directories are Beaucoup!, Galaxy, Google Directory, Open Directory Project, and Yahoo! Directory.

   Subject directories are best for browsing and for searches of a more general nature.

[PowerPoint 2-35 here]

3. Metasearch Engines: A ***metasearch engine*** allows users to search using several search engines simultaneously. Metasearch engines are very fast and can produce a good picture of what's available across the web and where it can be found.

   Examples are Dogpile, Mamma, MetaCrawler, and Webcrawler.

4. Specialized Search Engines: Users can also use ***specialized search engines***, which help locate specialized subject matter (such as material about movies, health, and jobs).

   Examples are Internet Movie Database (movies), WebMD (health), and Monster Board (jobs).

Additional Information: What's True & Untrue?

What do these terms mean: *glurge gallery*, *inboxer rebellion*, *wooden spoons*, *rumors of war*? To find out, go to:

www.snopes.com

Then check out a category of interest to you and see how much untrue information is circulating about it.

Web Exercise: Find How Search Engines Are Rated

The following websites give lists of search engines, categorized on various bases:

www.thesearchenginelist.com/
http://searchenginewatch.com/

G. Smart Searching: Three General Strategies

[PowerPoint 2-36 here]

To save time, you should have a strategy when doing a search. Some tips are as follows:

1. If You're Just Browsing—Two Steps: If you're just trying to figure out what's available in your subject area:
    - Try typing search keywords into a subject directory
    - Or try ending keywords into a metasearch engine to see what else is out there.
2. If You're Looking for Specific Information—For specific information, there are two possibilities:
    - Try Answers.com "one-click" search
    - Type keywords into both a major keyword index such as Google and then a specialized search engine.
3. If You're Looking for Everything You Can Find on a Subject: Try the same search on several search engines.

Teaching Tip: Validating & Crediting Research

Remind students that the same rules apply for validating, sourcing, and crediting Internet research as apply to hardcopy research in libraries. In the text, the Practical Action box on page 77 gives some guidelines for online research. *The Chicago Manual of Style*, 16th edition, also provides information on this topic.

H. Multimedia Search Tools: Image, Audio, & Video Searching

[PowerPoint 2-37 here]

Most web searches involve text, but there other kinds of resources as well.

1. Still Images: Some search indexes deal with images. Examples: Yahoo! Search—Image Search, Google Image Search, Bing Images.

2. Audio & Video: Other search engines deal with audio as well as video. Examples: Yahoo! Music and AltaVista Audio Search for audio, and AOL.video and Open Video Project for video.
3. Scholarly: Search engines such as Google Scholar search scholarly abstracts, books, white papers, and so on.

I. Desktop Search: Tools for Searching Your Computer's Hard Disk

[PowerPoint 2-38 here]

Users sometimes have so much stuff or unorganized stuff on their hard disks that they lose track of it. Desktop search engines help them find things.

A ***desktop search engine*** is a tool that extends searching beyond the web to the contents of your personal computer's hard disk. Desktop search allows users to quickly and easily find words and concepts stored on the hard-disk drive, using technology similar to that in web search engines.

Free desktop search tools can be downloaded from one of the principal search engine services, often as part of a toolbar. (A toolbar is a bar across the top of the display window on your computer screen, offering frequently executed options or commands.)

J. Tagging: Saving Links for Easier Retrieval Later

[PowerPoint 2-39 here]

Once you've found favorite websites, you can keep them found by using the bookmarking or favorites feature. But there is another way called "tagging." ***Tags*** are do-it-yourself labels that people can put on anything found on the Internet, from articles to photos to videos. Unlike bookmarks or favorites, these tags can be easily shared with other people, which allows people to share similar interests and ideas.

Tags are available through social-bookmarking sites such as delicious.com or BlinkList or photo-sharing services such as Flickr.

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2.4 EMAIL & OTHER WAYS OF COMMUNICATING OVER THE NET

Key Question: What are email and webmail, attachments, instant messaging, FTP, newsgroups, listservs, and netiquette?

Once people are connected to the Internet, many want to send and receive electronic mail, or email.

[PowerPoint 2-41 here]

Incoming mail is stored in your mailbox on the Internet access provider's computer, usually a server called a *mail server*.

Outgoing mail is sent to a ***Simple Mail Transfer Protocol*** (***STMP***) server.

When you use your email software to retrieve your messages, the email is sent from the Internet access provider's mail server to your computer using ***Post Office Protocol version 3*** (***POP3***).

[PowerPoint 2-42 here]

A. Two Ways to Send & Receive Email

There are two ways to send and receive email—via an *email program* or via *web-based email*

[PowerPoint 2-43 here]

- Email Program: An ***email program*** enables you to send email by running email software on your computer. The email software interacts with an email server at your Internet access provider to send and receive email.

  Your incoming mail is stored on the server in an electronic mailbox. When you access the email server, your incoming messages are sent to your software's inbox, where they are ready to be opened and read.

  Examples of email programs are Microsoft's Outlook and Outlook Express and Apple Inc.'s Apple Mail.

One advantage of standard email programs is that you can easily integrate your email with other applications, such as calendar, task list, and contact list.

[PowerPoint 2-44 here]

- Web-Based Email: With ***web-based email***, or webmail, you send and receive messages by interacting via a browser with a website. The main advantage of web-based email is that you can easily send and receive messages while traveling anywhere in the world.

  Examples of webmail carriers are Yahoo! Mail, Windows Live Hotmail, Google's Gmail, and AOL Mail.

  Note that webmail is not generally as secure as proprietary email programs through paid ISPs.

B. How to Use Email

To send and receive email messages, you'll need an email address, sort of an electronic mailbox. All such addresses follow the same approach: username@domain.

Example: Joe.Black@earthlink.net.us

[PowerPoint 2-45 here]

- User Name: Joe_Black is the ***user name*** (or user ID). It identifies who is at the address (Joe_Black).
- "@" Sign: Unlike web URLs, email addresses use the "**@**" (called "at") sign—looks kind of like an "a" in a circle.
- Domain Name: Earthlink is the ***domain name***. Located after the @ symbol, it tells the location of the address (@earthlink).
- Top-Level Domain: .net is the ***top-level domain*** (domain code). This three-letter extension to the domain name indicates the type of domain (e.g., commercial, educational, military).
- Country: .us is the ***country***. Some email addresses also include a two-letter country designation (e.g., us, .ca, .de, .mx).

Web Exercise: Detailed Tutorial on How Email Works

Ask students to browse the following website for a detailed tutorial on how email works:

www.learnthenet.com/learn-email/

C. Being Effective with Email

Five tips for being effective with email:

[PowerPoint 2-46 here]

1. Type Addresses Carefully: no typos. Addresses must be typed exactly, including capitalization and all underscores and periods.
2. Use the Reply Command: The easiest way to avoid addressing mistakes is to use the reply command when responding to someone else's message. BUT—*Don't use the Reply All command unless you want your reply to be sent to ALL the original email's recipients.*
3. Use the Address-Book Feature: You can store the email addresses of people sending you messages in your program's address book. The address book allows you to organize addresses into various groups, such as your friends, relatives, club members, so you can easily send all members of a group the same message with a single command.
4. Deal with Each Email Only Once: When a message comes in, delete it, respond to it, or file it away in a folder. Don't use your inbox to store messages.
5. Don't "Bloat" Your Email. Keep emails simple. Don't put lots of type styles, logos, icons, colors, etc., into emails. They will take too long to send and for others to download (receive).

D. Sorting Your Email

Email programs usually offer filters for automatically organizing email according to the name of the sender or the mailing list. Examples of email folders are shown on the right side of PowerPoint slide (slide 2-46).

E. Attachments

[PowerPoint 2-47 here]

An ***email attachment*** is a copy of a file or a document that you send attached an email to one or more people.

- Not Just Text: Almost anything, including sound and video clips as well as text and graphic items, that a user saves on his/her computer can be attached to an email.
- Recipient Must Have Same Software: However, the email recipient must have the same software used to create the attachment in order to be able to open the attachment. (For example, if the recipient doesn't have Excel, he or she won't be able to read an Excel spreadsheet that you try to send.)
- Large Attachments Are Difficult: Large attached items may not clear the ISP's server or be accepted by the recipient's computer, so you should keep your attachments small or compress them before attaching them (e.g., using WinZip or StuffIt).
- Attachments May Carry Viruses: One caution: You should not open attachments from unknown sources, since viruses, or rogue programs that can do serious damage, can be spread through attachments. (Viruses are covered in Chapter 6.)

Additional Information: Can Employers Read Employee Email?

Remind students that email is company property. The company can review an employee's email without permission; indeed, many companies use surveillance software to monitor employees' online activities. Employees should send only email that is acceptable to the work environment.

F. Instant Messaging

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With ***instant messaging*** (***IM***), users on a given email system can send a message and have it pop up instantly (in real-time) on the screen of anyone else logged onto that system. Messages appear on the display screen in a small window, a rectangular area containing a document or activity, so that users can exchange messages almost instantaneously while operating other programs.

- Getting Instant-Messaging Capability: To use instant messaging, users must register with an IM service and then download the supplier's IM software.

Examples of IM services are AOL/AIM, MSN, Google Talk, MySpace, Facebook, and Yahoo! Messenger.

- The Downside of IM
  —Lacks privacy that other forms of communication offer. IM users have virtually no privacy.
  —Time wasters when you have to get work done.

Additional Information: More about IM

IM requires that both parties be logged onto their IM service at the same time. Also known as a "chatting," In business, IM provides a way to contact coworkers any time of the day, providing they are at their computers or using a compatible cellphone.

Email and instant messaging are often used in a similar manner, but email is not real-time. Like email attachments, IM systems generally allow for file transfers. Also like email, some systems let you send messages even if the recipient is not currently online.

To set up instant messaging, you have to add the usernames of the people you want to message with to your "buddy list" (friend list, contact list). When they log on to the Internet with their IM software, and provided they have not configured themselves as "invisible," you are instantly alerted. When they log off, you are also notified. Each system has its own method for blocking incoming and outgoing messages.

Instant messaging became popular after Israeli-based ICQ introduced its service in 1996, which was later acquired by AOL. Today, AOL's Instant Messenger (AIM, or Messenger.me), Digital Sky's ICQ, Microsoft's MSN Messenger/Windows Messenger, and Yahoo! Messenger are the major services. Cerulean Studio's Trillian (www.trillian.im/) is a single IM program that works with all these services as well as the Internet's traditional IRC chat rooms.

Additional Information: IM Services & Products

For a list of IM services and products, go to:

www.instantmessagingplanet.com

Group Exercise: Demonstrating Instant Messaging

Have a person online during the class period, preferably someone from another state or country, and demonstrate instant messaging by sending messages to the person. If there are several computers in the classroom, have the students instant message one another.

G. FTP—for Copying All the Free Files You Want

[PowerPoint 2-49 here]

File Transfer Protocol (***FTP***) is a software standard that allows file transfer between computers, including those with different operating systems (such as Microsoft Windows and Linux).

- FTP Site: You can connect to a remote computer, called an FTP site, and transfer files to your own microcomputer's hard disk (or other Internet-connected device) via TCI/IP over the Internet.
- Free Files: FTP sites offer free files covering nearly anything that can be stored on a computer, such as software, games, photos, maps, etc.
- Public vs. Proprietary FTP Sites. Some FTP files are open to the public at anonymous FTP sites. Other FTP sites require registration and passwords.
- Downloading FTP Files: You can download FTP files using either your web browser or special software (called an FTP client program), such as Fetch, SmartFTP, and Cute.

Additional Information: A List of FTP Clients

Email was originally designed to transfer only ASCII text, and it still cannot be used to transfer certain types of binary files. Attachments can be used to transfer other types of tiles, but FTP can be used for large files. For a list of FTP clients, go to

www.answers.com/List+of+FTP+clients

H. Newsgroups—for Online Typed Discussion on Specific Topics

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A ***newsgroup*** (or *forum*) is a giant electronic bulletin board on which users conduct written discussions about a specific subject.

- Newsgroup Topics: There are thousands of Internet newsgroups, which charge no fee, and they cover an amazing array of topics.
- Newsgroups Use Usenet: Newsgroups take place on a special network of computers called ***Usenet***, a worldwide public network of servers that can be accessed through the Internet (www.usenet.com).
- You Need a Newsreader: To participate in a newsgroup, you need a ***newsreader***, a program included with most browsers that allows you to access a newsgroup and read or type messages.

Additional Information: More about Newsgroups

For detailed information on newsgroups, go to

www.answers.com/newsgroups?gwp=11

I. Listservs: Email-Based Discussion Groups

A ***listserve*** is an automatic mailing-list server that sends email to subscribers who regularly participate in discussion topics.

- How to Join: To subscribe, send an email to the list-server moderator and ask to become a member.
- Delivery: After you subscribe, you will automatically receive email messages from anyone who responds to the server.

Additional Information: The Term* Listserv *Is Trademarked

The word *Listserv* has come to be used loosely as a generic term for any mailing list application. However, it is a registered trademark licensed to L-Soft International, Inc., which markets the application commercially. For this reason, it is not legal to use the term commercially, except in reference to this product. See

www.lsoft.com/products/listserv.asp

If you are receiving email from companies that ask you to "click here" to unsubscribe, they are using Listserv technology.

J. Netiquette: Appropriate Online Behavior

The word netiquette is a contraction for "network etiquette." In general, netiquette means:

- Don't waste people's time.
- Don't say anything to a person online that you wouldn't say face to face.

Some specific rules of netiquette:

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- *Consult FAQs*: Most online groups post ***FAQs*** (***frequently asked questions***) that explain the expected norms of online behavior for a particular group. Always read FAQs first; do this before someone in the online group tells you you've made a mistake.
- *Avoid Flaming*: ***Flaming*** is writing an online message that uses derogatory, obscene, or inappropriate language. Flaming is a form of public humiliation inflicted on people who have failed to read FAQs or otherwise not observe netiquette. (Something that can smoothe communication online is the use of emoticons, keyboard-produced pictorial representations of expressions.)
- *Don't SHOUT*: Use of all-capital letters is considered the equivalent of shouting. You should avoid using all-capital letters, except for occasional emphasis.
- *Be Careful with Jokes*: In email, subtleties are often lost, so jokes may be taken as insults or criticism.
- *Avoid Sloppiness, but Don't Criticize Others' Sloppiness*: Try to avoid spelling and grammar errors, but don't criticize those same errors in others' email messages.
- *Don't Send Huge File Attachments, Unless Requested*: Don't send huge files without permission from your recipient, since he or she may not have the computer capacity to receive them.
- *When Replying, Quote Only the Relevant Portion*: When replying to a couple of matters in a long email, don't send back the entire message. Instead, edit the original text down to the relevant paragraphs, then add your response.

- *Don't "overforward*": Don't automatically forward emails to your friends without checking if the contents are true and appropriate.

[PowerPoint 2-52 here]

2.5 THE ONLINE GOLD MINE: TELEPHONY, MULTIMEDIA, WEBCASTING, BLOGS, E-COMMERCE, & SOCIAL NETWORKING

Key Question: What are Internet telephony, various kinds of multimedia, RSS, and different web feeds (webcasting, blogging, podcasting), types of e-commerce, and the social networking?

A. Telephony: The Internet Telephone & Videophone

[PowerPoint 2-53 here]

Internet telephony, or ***VoIP*** phoning (VoIP is short for ***Voice over Internet Protocol***), uses the Internet to make phone calls, either one-to-one or for audioconferencing.

- Low Cost: This technology allows users to make long-distance phone calls that are surprisingly inexpensive or even free.
- Use Either Phone or PC: Two ways to make calls:
  —Without a computer, you simply pick up a standard telephone and dial a special phone number that will "packetize" your conversation—break up the conversation into "information packets" that can be sent over separate lines and regrouped at the destination.
  —With a computer, you need a sound card and a microphone, a modem linked to a standard Internet service provider, and Internet telephone software such as Google Talk, iChat, and Skype.
- Sound Quality: Sound quality used to be a problem with VoIP systems, but the widespread availability of broadband has improved call quality in many areas.
- Videoconferencing: Besides carrying voice signals, Internet telephone software also allows videoconferencing, in which participants are linked by videophones that transmit pictures.

Additional Information: More about Internet Telephony

Internet telephony servers link telephone lines to the Internet. See:

www.answers.com/topic/telephony-server?hl=Internet&hl=telephony

Students can experiment with Internet telephony for free, and watch an animated explanation, at

www.skype.com

B. Multimedia on the Web

[PowerPoint 2-54 here]

Many websites employ complicated multimedia effects, using a combination of text, images, sound, video, and animation.

- Plug-ins: Early browsers were unable to handle many graphics, sound, and video (multimedia) files, so external applications called plug-ins were developed for users to download to their systems. A ***plug-in*** is a computer program that adds a specific feature to a browser, allowing it to play or view certain files.

  Examples: To view PDF documents, you may need to download Adobe Acrobat Reader. To view a high-quality video, you may need to download RealPlayer. Quicktime is a media player for the Apple Macintosh.

Additional Information: More about Plug-Ins

Plug-ins are slightly different from extensions, which modify or add to existing functionality. For more on plug-ins, go to:

www.answers.com/topic/plugin?method=6

For a list of plug-ins of many types, go to:

www.ask.com/web?l=sem&ifr=1&qsrc=999&q=free%20plugins&siteid=15145&o=15145&ar_uid=B1F370A8-06B1-482B-B801-ECC6942F6C6F&click_id=F0B2AA11-8D7B-452B-911D-449924B54C35
www.quicklookplugins.com/

- Developing Multimedia: Applets, Java, & Visual Studio.NET: How to website developers get all those nifty special multimedia effects? Often web pages contain links to ***applets***, small programs that can be quickly downloaded and run by most browsers.

  Applets are written in ***Java***, a complex programming language that enables programmers to create animated and interactive web pages. Java applets enhance web pages by playing music, displaying graphics and animation, and providing interactive games.

  Microsoft offers Visual Studio.NET to compete with Java.
- Text & Images. All kinds of text documents and graphic images are available on the web. Most web pages combine both text and images. One interesting innovation is aerial maps, such as Google Earth, a satellite imaging program that allows you to zoom in for a close-up of your house, for example.

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- Animation: ***Animation*** is the rapid sequencing of still images to create the illusion of motion. It is used in videogames, as well as in moving banners displaying sports scores or stock prices.
- Video: A file such as a video clip may have to be completely downloaded before you can view it; this may take several minutes. More usually, however, a file is displayed as streaming video and viewed while it is still being downloaded. ***Streaming video*** is the process of transferring data in a continuous flow so that you can begin viewing a file even before the end of the file is sent.

  Example: RealPlayer offers live, TV-style broadcasts over the Internet as streaming video to be viewed on your PC screen.
- Audio: Audio, such as sound or music files, also can be transmitted in two ways:
  —Downloaded completely before the file can be played. Examples are music services, such as eMusic and iTunes Music Store.
  —Downloaded as streaming audio, which allows you to listen to the file while the data is still being downloaded. An example is RealAudio.

C. The Web Automatically Comes to You: Webcasting, Blogging, & Podcasting

It used to be that you had to do the searching on the web. Now the web will come to you. Three technologies are webcasting, blogging, and podcasting.

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- Push Technology & Webcasting: The trend began in the late 1990s with push technology, which later resulted in webcasting. ***Push technology*** is software that automatically downloads information to personal computers. (This is opposed to pull technology, in which you go out and search on the Internet.) One example of push technology, ***webcasting***, is the process of automatically sending customized text, video, and audio to users' computers on a regular basis or live on demand.

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- Blogging—RSS, XML, & the Rise of the Blogosphere
  —RSS was built to be simpler than push technology. ***RSS newsreaders***, or ***RSS aggregators,*** are programs that scour the web frequently and pull together in one place web "feeds" from several websites. Thus, information is targeted very specifically.
  —RSS is based on ***XML***, or ***extensible markup language***, a web-document tagging and formatting language that is an advance over HTML and that two computers can use to exchange information.
  —XML and RSS have morphed into the ***blogosphere***, the total universe of blogs—***blogs*** are short for web log, a diary-style web page. Blogs are being written on all kinds of subject areas. Some people have turned blogs into successful businesses, but most are usually abandoned.

Additional Information: More about Blogs

The XML-based format for publishing headlines of the latest updates posted to a blog or website for use by other websites and direct retrieval by end users is called a *syndication format*. The format, known as a "feed," "news feed," or "web feed," includes a headline, short description, and link to the article. For a master list of syndication feeds, visit

www.syndic8.com.

A syndication format enables websites that share a common interest to expand their content by publishing news headlines from other websites and blogs. In fact, a large news site can be entirely made up of syndication feeds.

By subscribing to several feeds, users can quickly review the latest news on those sites from a consolidated index rather than browsing from site to site. The software viewer, which is called an "RSS reader," "newsreader," "news aggregator," "feed viewer," or "headline viewer," automatically searches selected sites and presents the latest headlines in chronological order to the user. Viewer plug-ins for Web browsers are available.

In addition, there are websites that search for and aggregate feeds that are displayed entirely in the browser. Subscribing to a site such as BlogLines (www.bloglines.com) can eliminate the need to download a news reader or a plug-in, as any web browser can be used. A source for finding feeds is (www.google.com/support/reader/), a search engine devoted to finding sites with syndication feeds.

Web Exercise: Finding Out about Blogs

Ask students to use a search engine, type the word "blog" or the words "web log" and the name of a topic that interests them—for example, blog AND Clydesdales. What are people saying about this topic? Do students think that bloggers' views are useful? Do students think that bloggers' opinions should be accorded any particular importance? Ask students to research online short reports on the reliability and significance of blogs. Ask them to give pros and cons.

- Podcasting***: Podcasting*** is the recording of Internet radio or similar Internet audio programs. The podcast is delivered via RSS feed over the Internet to a subscriber, who can play it back on a computer or digital audio player/

D. E-Commerce: B2B Commerce, Online Finance, Auctions, & Job Hunting

[PowerPoint 2-58 here]

- ***E-commerce*** (*electronic commerce*) refers to conducting business activities online. Among areas covered by e-commerce are B2B commerce, online finance, auctions, and job hunting.

- ***B2B commerce*** (*business-to-business commerce*) is the electronic exchange of goods and services directly between companies, cutting out traditional intermediaries.
- Trading, Banking, & E-Money: ***Online finance*** can include bill paying, stock trading, investing, tax paying, bank account managing, loan processing, and e-money such as PayPal.
- Auctions: ***Online auctions,*** such as eBay, link buyers and sellers. There are generally two types:
  —Person-to-person auctions: These types, such as eBay, connect buyers and sellers for a listing fee and a commission on sold items.
  —Vendor-based auctions: These types, such as OnSale, buy merchandise and sell it at discount. (Some are specialized, such as Priceline, which offers airline tickets and hotel bookings.)
- Online Job Hunting: There are more than 2,000 websites— such as Monster.com and CareerPath.com—that help job hunters with employers,

E. Web 2.0 & the Social Web: Social Networking, Media Sharing, Social-Network Aggregation, & Microblogging

[PowerPoint 2-59 here]

Web 2.0 is a term used to describe the move toward a more social, collaborative, interactive, and responsive web. Easy-to-use websites allow users to better harness the collective power of people, which has led to a "social web" or "social media," involving blogs, wikis (for sharing information), social networks, and media sharing. The common theme of all these is human interaction.

More on Web 3.0 (The "Semantic" Web")

www.labnol.org/internet/web-3-concepts-explained/8908/
http://computer.howstuffworks.com/web-30.htm
www.pcmag.com/article2/0,2817,2102852,00.asp#fbid=pPqSSIwSAfD
http://money.cnn.com/2009/01/07/technology/hempel_threepointo.fortune/

- MySpace, Facebook, & Other Social-Networking Websites

A ***social-networking website*** is an online community that allows members to keep track of their friends and share photos, videos, music, stories, and ideas with other registered members.

Examples are MySpace, Facebook, and the business-contact site LinkedIn. (Note: Chapter 9 covers the drawbacks of social networking sites.)

- YouTube, Flickr, & Other Media-Sharing Websites:
  A ***media-sharing website*** is a type of online social network in which members share media such as photos, videos, and music. The most popular example is YouTube, but others are Hulu, Flickr, and Photobucket.

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- FriendFeed, Spokeo, & Other Social-Network Aggregators
  Social-network aggregators are online sites that collect content from all of a user's various social network profiles into one place, then allow him or her to track friends and share other social network activities.

  Examples are FriendFeed, Spokeo, Iminta, Plaxo, Reader, and Mugshot.
- Twitter & Tumblr Social Networking & Microblogging Services
  Thoughtcasting and *microblogging* are terms for sending a text message from your mobile phone to friends' websites or phones. Messages are limited to 140 characters or less, owing to length restrictions on text messaging.

  Examples are the services Twitter and Tumblr. Tumblr lets you express yourself using multiple media.

Some Twitter Statistics

http://blog.twitter.com/2011/03/numbers.html
http://www.marketinggum.com/twitter-statistics-2011-updated-stats/
http://thenextweb.com/socialmedia/2011/09/09/the-big-growth-stats-facebook-vs-twitter/

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2.6 THE INTRUSIVE INTERNET: SNOOPING, SPAMMING, SPOOFING, PHISHING, PHARMING, COOKIES, & SPYWARE

Key Question: How can I protect myself against the various kinds of Internet dangers: snoopers, spam, spoofing, phishing, pharming, cookies, and spyware—adware, browser and search hijackers, and key loggers?

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A. Snooping on Your Email: Your Messages Are Open to Anyone

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Email is not private. When sending email, you need to pretend every electronic message is a postcard that can be read by anyone.

- Corporate Management Can View Employee Email: The law allows employers to intercept employee communications if one of the parties involved—such as the employer—agrees to the interception.
- Friends Can Send Your Email Anywhere: You have no control over whether your friends will ship your email on to someone else, which might end up embarrassing you.
- Your ISP May Not Protect Your Privacy: Internet access providers may post your email publicly or even sell their customer lists.

B. Spam: Electronic Junk Mail

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Spam is unsolicited email, or electronic junk mail, in the form of advertising or chain letters.

- Spam Can Be Overwhelming: Spam can be an overwhelming, time-consuming problem for many email users.
- How to Manage Spam: Some ways to manage spam are shown in PowerPoint slide 2-64).

Additional Information: Origin of the Term Spam

The textbook mentions how the term *spam* as applied to unwanted email supposedly originated with a Monty Python's Flying Circus comedy sketch in the early 1970s, in which every item on a restaurant menu contained Spam, and there was nothing a customer could do to get a meal without it. The sketch derived from the fact that, in England during World War II, Spam (Hormel's processed meat) was abundantly available while other foods were rationed.

The sketch goes as follows

Mr. Bun: Morning.
Waitress: Morning.
Mr. Bun: Well, what you got?
Waitress: Well, there's egg and bacon; egg, sausage, and bacon; egg and spam; egg, bacon and spam; egg, bacon, sausage, and spam; spam, bacon, sausage, and spam; spam, egg, spam, spam, bacon, and spam; spam, sausage, spam, spam, spam, bacon, spam, tomato, and spam; spam, spam, spam, egg, and spam; (Vikings start singing in background) spam, spam, spam, spam, spam, spam, baked beans, spam, spam, spam and spam . . .

Some people believe that *spam* is an acronym for "sales promotional advertising mail" or "simultaneously posted advertising message."

Additional Information: More about Spam

Visit the following site to understand more about spam and what to do about it:

www.pcworld.com/news/article/0,aid,113431,00.asp

The following website gives reviews of spam-blocking software:

http://spam-filter-review.toptenreviews.com

This following site covers antispam laws in the USA and Europe:

www.spamlaws.com

C. Spoofing, Phishing, & Pharming: Phony Email Senders & Phony Websites

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There are several kinds of pretenses that involve the use of phony email and websites that students should be alert for. They go under the names *spoofing*, *phishing*, and *pharming*.

- Spoofing—Using Fake Email Sender Names: ***Spoofing*** is the forgery of an email sender name so that the message appears to have come from someone other than the real sender. Spoofing is one of the main tactics used by spammers to trick email recipients into opening and perhaps responding to their solicitations.

  The best defense: *If you don't know the sender, don't open the email.*

Additional Information: More about Email Authentication

For a detailed discussion of email authentication, go to:

www.answers.com/topic/email-authentication

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- Phishing—Using Trusted Institutional Names to Elicit Confidential Information: ***Phishing*** is the sending of a forged email that directs receivers to a replica (fake) of a real web page, both of which pretend to belong to a real company. The purpose of the fraudulent sender is to "phish" (fish) for, or entice, people to share their personal, financial, or password data. The fake website looks like the real thing and is usually for a trusted name such as "Bank of America," "eBay," or "Best Buy."

  You should be suspicious of any email that directs you to a website that requests confidential information, such as your Social Security number.

Additional Information: Example of Phishing Attempt

For an example of a phishing attempt, go to:

http://home.pcisys.net/~tbc/misc/phish001.htm

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- Pharming—Redirecting You to an Impostor Web Page: In ***pharming***, thieves implant malicious software on a victim's computer that redirects the user to an impostor web page even when the individual types the correct address into his or her browser.

  One way to protect yourself is to make sure you go to special secure web pages, such as any financial website, which begin with https (for "http secure") rather than the standard http.

Additional Information: More about Pharming

Pharming can also be done by hacking into DNS servers and changing IP addresses. Users are automatically redirected to the bogus site, at least for some period of time until the DNS records can be restored.

For example, if a bank's DNS were changed, users could be redirected to a website that looks familiar. The bogus site could just collect usernames and passwords, or it could, using some pretense, request financial information. Unlike phishing schemes that use email to make people go to the phony site, pharming is more natural. Users are going to the site on their own and are certainly not suspicious because the pages look familiar.

D. Cookies: Convenience or Hindrance?

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Cookies are little text files left on your computer's hard disk by some websites that you visit. The text files could be your log-in name, password, and browser preferences. The websites retrieve the data when you visit them again.

- The Benefits of Cookies: Cookies provide a way for the website to identify users and keep track of their preferences. Also, you might not have to type in all your info every time you visit the site.
- The Drawbacks of Cookies: Cookies don't transmit viruses, but they can be used to gather information about you and your browsing habits, which some websites sell to marketers to try to target you for their products.

Additional Information: More about Cookies

The default settings in your web browser typically allow "first-party" cookies that do not contain any personal information but not "third-party" cookies. First-party cookies are ones that are created by the website you are visiting. Third-party cookies are created by a website other than the one you are currently visiting; for example, by a third-party advertiser on that site. The purpose of such cookies is usually to track your surfing habits, which is why third-party cookies are considered an invasion of privacy and riskier than first-party cookies.

Users can prevent all cookies from being stored in their computers, but that severely limits the web surfing experience. To change settings, look for the browser's cookie options in the Options or Preferences menu.

Proprietary software programs such as Norton Internet Security and Webroot also allow users to individualize cookie settings.

What happens if you refuse cookies? Read the articles at:

http://computer.howstuffworks.com/cookie.htm
www.perlservices.net/en/faq/cookies.shtml

E. Spyware—Adware, Browser & Search Hijackers, & Key Loggers: Intruders to Track Your Habits & Steal Your Data

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Spyware is deceptive software that is surreptitiously installed on your computer via the web. Once installed on your hard disk, it allows an outsider to harvest information about you, such as keystrokes, passwords, your email address, and/or your history of website visits.

The most common forms of spyware:

- Adware or Pop-Up Generators: ***Adware***, or ***pop-up generators***, is a kind of spyware that tracks web surfing or online buying so that marketers can send users targeted and unsolicited pop-up ads and other ads. Pop-up ads are a form of online advertising in which, when you visit certain websites, a new window opens, or "pops up," to display information. Adware can be developed by legitimate companies but also by criminals (purveyors of pornography, gambling) overseas.
- Browser Hijackers & Search Hijackers: There are two kinds of damaging spyware:

—***Browser hijackers*** change settings in your browser without your knowledge, often replacing your home page with another web page.
—***Search hijackers*** intercept your legitimate search requests made to real search engines and return results from phony search services designed to send you to sites run by the hijackers.

- Key Loggers: ***Key loggers***, or *keystroke loggers*, record each character you type and transmit that information to someone else on the Internet, making it possible for strangers to learn your passwords and other information.

The Practical Action box on page 107 of the txt gives some tips for avoiding spyware.

Additional Information: More about Spyware

Spyware can come bundled with an otherwise apparently useful program. The makers of such packages usually make them available for download free of charge, so as to encourage wide uptake of the spyware component.

NOTE: The Experience Box on Plagiarism (p. 108 in the textbook) briefly covers some serious issues. For a very good coverage of plagiarism and the Internet— and plagiarism in general— see *Craft and Voice*, 2nd edition, McGraw-Hill 2013, Chapter 5. Also:

www.plagiarism.org/

http://docs.google.com/viewer?a=v&q=cache:3oSxBLRvG78J:www.wadsworth.com/english_d/special_features/plagiarism/WPAplagiarism.pdf+wpa+best+practices&hl=en&gl=us&pid=bl&srcid=ADGEESgada7GOZkdp0heMYBqABCq4z04p6ZeSlbV7LaSqjQNCt5iKxgOf11CCrXZnhsFHvhBGb4yAI03Sq3g6zHe2dAQJ4HPWFqKF6EafaVHHA1VxUsHvkrLz0-_7ms84eDdx4kEQb6S&sig=AHIEtbQj6bsPCMWj2L2GBf296bnMzYOnaA

Answers to End-of-Chapter Text Exercises

Self-Test Questions

1. bits per second (bps), kilobits per second (Kbps), megabits per second (Mbps), gigabits per second (Gbps) 2. cable modem 3. satellite (communications satellite) 4. ISP (Internet service provider) 5. window 6. flaming 7. browser (web browser) 8.

website 9. protocol 10. plug-in 11. spam 12. bandwidth 13. URL 14. cookies 15. phishing 16. key logger

Multiple-Choice Questions

1. b 2. c 3. d 4. c 5. d 6. b 7. c 8. e 9. b 10. a 11. b 12. b

True/False Questions

1. F (It's the reverse.) 2. F 3. F 4. F 5. F (dial-up) 6. F 7. T 8. F 9. T 10. F

Short-Answer Questions

1. DSL, cable modem, satellite, T1/T3, radio waves
2. To *log on* means to make a connection to a remote computer. Users must be familiar with log-on procedures to go online.
3. *Netiquette* short for "network etiquette," provides guides to appropriate online behavior. In general, netiquette has two basic rules: (a) Don't waste people's time, and (b) don't say anything to a person online that you wouldn't say to his or her face.
4. *Bandwidth* refers to how much data—text, voice, video, and so on—can be sent through a communications channel in a given amount of time. Different communications systems use different bandwidths for different purposes. The wider the bandwidth, the faster data can be transmitted.
5. Whereas with email you can connect only with specific addresses you know about, with the Web you have hypertext, a system in which documents scattered across many Internet sites are directly linked, so that a word or phrase in one document becomes a connection to a document in a different place. Links are indicated by underlining or highlighting. If the user clicks on the link, he or she is taken to another document or website.
6. A cable modem connects a computer to the Internet via a cable-TV system. DSL (digital subscriber line) uses special hardware and software to transmit data over regular phone lines. DSL is faster than standard data transmission over regular phone lines, and cable modem transmission is faster than DSL.
7. The Internet is a worldwide computer network that connects hundreds of thousands of smaller networks. No one owns the Internet; its components are owned and shared by thousands of private and public entities. When you use your personal computer at home, you connect to the Internet via your local loop, over telephone wires or cable. The local

loop connects you to your Internet service provider (ISP), whose headquarters can be almost anywhere but who provides local points-of-presence (POPs) around the country, so users don't have to pay long-distance charges to connect. The POP acts as a local gateway to the ISP's network. The ISP functions as an interface between you and the rest of the Internet. Some ISPs have their own high-speed backbones to transmit data; others lease backbone connections (Internet Exchange Points, or IXPs) through network service providers (NSPs) run by major communications companies. Each time you connect to the Internet, your ISP assigns you a temporary Internet protocol (IP) address, so that your location can be identified (to enable data transmission to your computer). The protocol, or set of standards, or rules, that enables all computers to use data transmitted on the Internet is TCP/IP (Transmission Control Protocol/Internet Protocol).

Although no one owns the Internet, everyone on the net adheres to standards overseen by ISOC (Internet Society). ICANN (Internet Corporation for Assigned Names and Numbers) regulates Internet domain names.

8. *IMAP* (Internet Message Access Protocol) offers expanded functions compared to POP3 (Post Office Protocol version 3) for retrieving email; for example, with IMAP one can search through email messages while they are still on the ISP's server—before one downloads them.
9. (See #7.)
10. (See #7.)
11. A *dynamic IP address* (Internet protocol address) changes each time the user connects his/her computer to the Internet; a *static IP address* remains the same. Established organizational websites (such as ISPs) and some large companies have static IP addresses.
12. A *blog* (weblog) is an Internet journal, a kind of online diary, maintained by a blogger.
13. (See #7.)
14. *B2B* is business-to-business e-commerce— the electronic sale or exchange of goods or services directly between companies.
15. Adware, browser hijacker, search hijacker, key logger

Responses to Knowledge in Action and Web exercises will vary throughout.