Chapter 2
The Internet and
World Wide Web

Chapter 2 Objectives
Discuss how the Internet works
Understand ways to access the Internet
Identify a URL
Know how to search for information on the Web
Describe the types of Web pages
Define Webcasting
Describe the uses of electronic commerce (e-commerce)
Identify the tools required for Web publishing
Explain how e-mail, FTP, newsgroups and message boards, mailing lists, chat rooms and instant messaging work
Recognize how Web pages use graphics, animation, audio, video, and virtual reality
Identify the rules of netiquette

The Internet
What is a network?
• A collection of computers and devices connected together via communications devices and media
  • Modems
  • Cables
  • Telephone lines
  • Satellites

The Internet
What is the Internet?
• Also called the Net
• A worldwide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals

The Internet
What are some of the services found on the Internet?

History of the Internet
How did the Internet originate?

ARPANET
Networking project by Pentagon’s Advanced Research Projects Agency (ARPA)

Goal: To allow scientists at different locations to share information and work together on military and scientific projects

Became functional in September 1969

Goal: To function even if part of the network were disabled or destroyed
History of the Internet

What is a host node?
- Also called a host
- Any computer that directly connects to a network
- Often stores and transfers data and messages
- Provides network connections for other computers
- Four original nodes on ARPANET

History of the Internet

How has this network grown?
- 1969: Four host nodes
- 1984: More than 1,000 host nodes
- Today: More than 100 million host nodes

History of the Internet

What is NSFnet?
- The National Science Foundation’s network
- Five supercomputer centers
- Connected to ARPANET in 1986

History of the Internet

Who provides the structure for the Internet today?
- Networks from corporations, commercial firms, and other companies
- Telephone companies
- Cable companies
- Satellite companies
- Government

History of the Internet

Who controls the Internet?
- The Internet is a public, cooperative, and independent network
- No single entity controls or owns the Internet
- Several organizations advise and define standards

Technology Trailblazer

Tim Berners-Lee
- Created the World Wide Web
- Director of the World Wide Web Consortium (W3C) at MIT
**How the Internet Works**

### What is an Internet service provider (ISP)?
- A business that has a permanent Internet connection
- Provides temporary connections to individuals and companies for free or for a fee

**Regional ISP**
- Provides access to the Internet through one or more telephone numbers local to a specific geographic location

**National ISP**
- Provides local telephone numbers in most major cities and towns nationwide
- May also provide a toll-free number

### What is a point of presence (POP)?
- An access point on the Internet
- Accessed by dialing a telephone number
- Select a service provider with at least one local POP telephone number

### What are other service providers?
- **Online Service Provider (OSP)**
  - Supplies Internet access
  - Has many members-only features that offer special content

- **Wireless Service Provider**
  - Company that provides wireless Internet access

### America Online
- World’s leading online service provider
- Services include electronic mail, software, computer support services, Internet access
- Founded in 1985 by Stephen M. Case

### How can you connect to the Internet?
- **High speed connection**
  - Employees and students
  - Computers part of a local area network (LAN)
  - Connect to service provider through a high-speed connection line leased from local telephone company

- **Dial-up access**
  - Home or small business
  - Computer, modem, regular telephone line
  - Dial into an ISP or OSP

- **Newer high-speed technologies**
  - Home and small business
  - Digital subscriber line (DSL) – provides high-speed Internet connections over regular copper telephone line
  - Cable modem – provides high-speed Internet connections through cable television network
How the Internet Works

What are three parts of an Internet connection?

- **Server**: Computer that manages the resources on a network. Provides a centralized storage area for resources such as programs and data. Also called a host computer.

- **Backbone**: Inner structure of the Internet. Communications lines that carry the heaviest amount of traffic.

- **Client**: Computer that can access the contents of the storage area on the server.

How might data travel the Internet using a telephone line connection?

1: You initiate an action to request data from the Internet.
2: A modem converts the digital signals from the computer into analog signals, which are understood by telephone lines.
3: Data (request) travels through telephone lines to a local ISP.
4: Data may pass through one or more routers before reaching its final destination.
5: The regional ISP uses lines, leased from a telephone company, to send data to a national ISP.
6: The national ISP routes data across the country to another national ISP.
7: Data moves from a national ISP to a local ISP and then to a destination server.
8: The server retrieves the requested data and sends it back through the Internet backbone to your computer.

p. 2.7 Fig. 2-3

What is an Internet protocol (IP) address?

- Number that uniquely identifies each computer or device connected to the Internet.
- Four groups of numbers, each separated by a period.
- Number in each group is between 0 and 255.

IP address 199.95.72.10

- First part identifies network.
- Last part identifies specific computer.

What is a domain name?

- Text version of an IP address.
- Components are separated by periods.
- Each domain name represents one or more IP addresses.

IP address 199.95.72.10

- Domain name www.scsite.com

What is a top-level domain (TLD) abbreviation?

- Identifies the type of organization associated with the domain.
- Sometimes called dot com when TLD is com.

What systems control domain names?

- **Domain name system (DNS)**: System on the Internet that stores the domain names and their corresponding IP addresses.
- **Internet Corporation for Assigned Names and Numbers (ICANN)**: Group that assigns and controls TLDs.
- **DNS server**: Translates the domain name into its associated IP address.
The World Wide Web

What is the World Wide Web (WWW)?
- Also known as the Web
- A worldwide collection of electronic documents
- Each document on the Web is called a Web page
- Can contain text, graphics, sound, and video
- Can contain built-in connections to other documents
- A Web site is a collection of related Web pages

What is a Web browser?
- Also called a browser
- Software program that allows you to access and view Web pages
- Two popular browsers for personal computers
  - Netscape
  - Internet Explorer

What is a home page?
- Starting page for a browser
- Provides information about the site’s purpose and content
- Some Web sites also refer to their starting page as a home page
- May be changed at any time

What is downloading?
The process of receiving information, such as a Web page, onto your computer from a server on the Internet
- Can take from a few seconds to several minutes
- You can speed up the display of pages by turning off the graphics and displaying only text in most Web browsers

How do Web-enabled handheld computers and devices access the Web?
- Use a special type of browser designed for their small screens
- Microbrowser – software program that accesses and displays Web pages that contain mostly text
- Also called a minibrowser

Microbrowser for a Web-enabled cellular telephone
What is a hyperlink?
- Also called a link
- Built-in connection to another related Web page or part of a Web page
- Allows you to obtain information in a nonlinear way

How can you identify a link?
- Link can be a word, phrase, or image
- Text links usually are underlined or in a color different from the rest of the document
- A graphical link may change its appearance when you point to it
- The shape of the pointer on the screen changes to a small hand with a pointing index finger when you position it on a link or point to the link

How do you navigate a variety of links?
- The activity of jumping from one Web page to another is surfing

What is surfing the Web?
- Links can point to an item 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
- The activity of jumping from one Web page to another is surfing

What is a Uniform Resource Locator (URL)?
- Unique address for a Web page
- Browser retrieves a Web page by using the URL
- Also called a Web address
- Type the URL into the address text box on the browser and press the Enter key to display a Web page

What are the parts of a URL?
- protocol
- domain name
- path
What is a Web server?
- A computer that delivers (serves) Web pages you request
- The same Web server can store multiple Web sites

What is a search engine?
- A software program you can use to find Web sites, Web pages and Internet files

What is a hit?
- Any Web page name that lists as the result of a search

What are some widely used search engines?
- AltaVista
- Excite
- Google
- Goolge
- Hotbot
- Lycos
- WebCrawler

What is a directory?
- An organized set of topics
- Used by a search engine to aid in locating Web sites
- Each major topic has related subtopics

What are the six basic types of Web pages?
- Advocacy Web page
- Business/marketing Web page
- Informational Web page
- News Web page
- Portal Web page
- Personal Web page
What is an advocacy Web page?
- Contains content that describes a cause, opinion, or idea
- Purpose is to convince the reader of the validity of the cause, opinion, or idea

What is a business/marketing Web page?
- Contains content that promotes or sells products or services
- Often allows you to purchase products or services online

What is an informational Web page?
- Contains factual information
- Many U.S. government sites provide information

What is a news Web page?
- Contains newsworthy material
- Stories and articles relating to current events, life, money, sports, and the weather

What is a portal Web page?
- Often called a portal
- Offers a variety of Internet services from a single, convenient location

What services are often found on a portal?
- Search engine
- Local, national, and worldwide news
- Stock quotes
- Reference tools
- E-mail
- Newsgroups or message boards
- Maps
- Shopping malls and auctions
- Calendars
- Chat rooms
What is a Web community?
- A Web site that joins a specific group of people with similar interests or relationships
- Usually offer special services to facilitate communication among members

What is a wireless portal?
- A portal specifically designed for Web-enabled handheld computers and devices
- Attempts to provide all information a wireless user might require
- Services include search engines, news, stock quotes, weather, maps, e-mail, calendar, instant messaging, and shopping

Company on the Cutting Edge
Yahoo!
- Co-founded by Jerry Yang and David Filo in 1994
- Started as a series of lists to organize favorite Web sites
- Today more than 166 million visitors access 189 million pages daily

What is a personal Web page?
- A Web page maintained by a private individual who normally is not associated with any organization
- Reasons: job hunting and sharing life experience with the world

What is multimedia?
- Any application that integrates text with other media elements
- Often used for Web pages to add appeal
- Multimedia Web pages often require more time to download because they contain large graphics and video or audio clips

What is a graphic?
- Also called a graphical image
- A digital representation of information such as a drawing, chart, or photograph
- First media used to enhance text-based Internet
What are the formats for graphics files on the Web?

- GIF (Graphics Interchange Format)
  - Also uses compression techniques to reduce file size
  - Works best for images with only a few distinct colors, such as line drawings, single-color borders, and simple cartoons

- JPEG (Joint Photographic Experts Group)
  - Graphical image that uses compression techniques to reduce the file size
  - Smaller sizes result in faster downloading of Web page
  - The more compressed the file, the smaller the file, but the lower the quality

Which two formats are most popular for the Web?

- GIF
- JPEG

What is a thumbnail?

- A small version of a larger graphical image
- Used because graphics files can be time consuming to display
- Usually click thumbnail to display the full-sized image

What is animation?

- The appearance of motion created by displaying a series of still images in rapid sequence
- Adds visual interest or draws attention to important information or links
- Animated GIF uses computer animation and graphics software to combine several images into a single GIF file

What is audio?

- Music, speech, or any other sound
- Individual sound files that you download to your computer
What is MP3?
• A popular technology that compresses audio
• Reduces an audio file to about one-tenth of its original size while preserving the original quality of the sound
• MP3 files are easily copied from the Web
  Controversy with respect to copyright infringement

How can you play MP3 files?
• Most current operating systems contain a program called a player
  plays audio in MP3 files on your computer
• Portable audio devices called MP3 players
  play MP3 files stored on CD or miniature storage media

What is streaming audio?
• Also called streaming sound
• Enables you to listen to the sound as it downloads
• Many radio and television stations use streaming audio to broadcast
• Two accepted standards
  • Windows Media Player
  • RealAudio – a component of RealPlayer

What is video?
• Consists of full-motion images that are played back at various speeds
• Most video also has accompanying audio

What video formats are used on the Web?

- MPEG standard (Moving Pictures Experts Group)
  Individual video files that you must download completely before you can play them on the computer
- Streaming video
  Allows you to view longer or live video images as they download to your computer
  Two widely used standards
    • RealVideo – a component of RealPlayer
    • Windows Media Player

What is a Web cam?
• Also called a cam
• A video camera whose output displays on a Web page
• Shows images that change regularly

Web cam
The World Wide Web

What is virtual reality (VR)?
- The use of computers to simulate a real or imaged environment that appears as a three-dimensional (3D) space
- VR world – a 3-D site that contains infinite space and depth
- Used for games as well as many practical applications

What is pull and push technology?
- Pull: Obtaining information by requesting it from a site
- Relies on a client to request a Web page from a server
- Push: Server automatically downloads content to your computer at regular intervals

What is Webcasting?
- Another name for push technology
- Delivers information at regular intervals without you having to request it
- Information can be viewed whether you are online or offline

Electronic Commerce

What is electronic commerce?
- Also known as e-commerce
- A financial business transaction that occurs over an electronic network such as the Internet

What are the three types of e-commerce?
- Business to consumer (B-to-C or b2C)
  - Sale of goods to the general public
- Consumer to consumer (C-to-C or C2C)
  - One consumer sells directly to another
- Business to business (B-to-B or B2B)
  - Businesses providing goods and services to other businesses

What are some features of e-commerce?
- Electronic storefront
  - The place where a customer visits an online business
- Shopping cart
  - Allows the customer to collect purchases
- Online auction
  - Site where you can bid on an item being sold by someone else
Masayoshi Son
- Helped to bring Japan to the forefront of the digital age
- Founded Softbank Corporation in 1981
- By 1995, Softbank controlled one-half of the personal computer software in Japan
- A leading member of Japan’s Prime Minister’s IT Strategy Council

Technology Trailblazer

Web Publishing

What is Web Publishing?
- The development and maintenance of Web pages

1. Plan: Think about issues that could affect the design of the Web page on paper.
2. Analyze and Design: Sketch a design of the Web page on paper.
3. Create: Create the Web page in a software package such as a word processing package on your hard disk.
4. Deploy: Copy (upload) the Web page from your hard disk to a Web server.
5. Maintain: Visit and revise your Web site regularly to be sure it is working and current.

Web Publishing

What is needed for creating a Web page?
- Also called Web page authoring

Hardware
- Digital camera
- Scanner
- Sound card
- Microphone
- PC camera

Software to prepare HTML
- HTML, (hypertext markup language)
- A set of special codes that format a file for use as a Web page
- Created with either:
  - Word processing package
  - Web page authoring software

Web Publishing

What else might be needed to create a Web site?

Apply to an official registrar for a specific domain name
Register site with search engines using a submission service
- A Web-based business that helps register your site
- Webmaster:
  - Individual responsible for maintaining a Web site and developing Web pages
Other Internet Services

What is e-mail?
- Electronic mail
- The transmission of messages and files via a computer network
- Use an e-mail program to work with messages

How do you send an e-mail message?
1. Start an e-mail program and point to the New Mail Message button.
2. Click the New Mail Message button to display the Message window.
3. Enter the recipient’s e-mail address, the subject, and the message in the Message window.
4. Click the Insert File button to attach a JPG file containing a picture to the message. Locate the file on your hard disk and click its name. An icon for the file displays. Click the Send button to send the message.

What is an Internet e-mail address?
- A combination of a user name and a domain name that identifies a user so he or she can receive Internet e-mail

How can you get e-mail?
- Most ISPs and OSPs provide an Internet e-mail program and a mailbox on a mail server as a standard part of their Internet access services
- Some Web sites provide e-mail services free of charge

What is a POP server?
- Post office protocol server
- When a message arrives at the recipient’s mail server, the message transfers to a POP or POP3 server
- POP server holds an e-mail message until the recipient retrieves it with his or her e-mail software
- POP3 is the newest version

How does an e-mail message travel?
1. Using e-mail software, you create and send a message.
2. Your e-mail program contacts the mail server of the service provider.
3. Software on the mail server determines the best route for the data and sends the message, which travels along Internet routers to the recipient’s mail server.
4. The mail server transfers the message to a POP3 server.
5. When the recipient uses e-mail software to check for e-mail messages, the message transfers from the POP3 server to the recipient’s computer.
What is FTP?
- File Transfer Protocol
- An Internet standard that allows you to upload and download files with other computers on the Internet

What are some FTP terms?
- **FTP server**: A computer that allows users to upload and download files using FTP
- **FTP site**: A collection of files that reside on an FTP server
- **anonymous FTP**: Anyone can transfer some, if not all, available files

What is a newsgroup?
- An online area in which users conduct written discussions about a particular subject
- A user sends a message to the newsgroup
- Other users in the newsgroup read and reply to the message

What is a newsreader?
- A program that enables you to access a newsgroup
- **article**: A previously entered message
- **post**: Add an article to a newsgroup
- **thread**: Also called threaded discussion

What is a message board?
- A type of discussion group that does not require a newsreader
- Also called a discussion board

What is a mailing list?
- A group of e-mail names and addresses given to a single name
- When a message is sent to a mailing list, every person on the list receives a copy of the message
- Subscribe or unsubscribe to mailing list to add or remove your name from the mailing list
- Some are known as LISTSERVs
Other Internet Services

What is a chat?
• A real-time typed conversation that takes place on a computer
• Real-time means that you and the people with whom you are conversing are online at the same time
• A chat room is a location on an Internet server that permits users to chat

A chat client is a program on your computer that allows you to chat

What is instant messaging (IM)?
• A real-time Internet communications service
• Notifies you when one or more people are online
• Allows you to exchange messages or files or join a private chat with them

Karen’s message immediately displays on Katy’s computer screen because she is online

Katy’s response to Karen

Netiquette
• Internet etiquette
• Code of acceptable behaviors users should follow while on the Internet

Summary of the Internet and World Wide Web
• The Internet
• History of the Internet
• How the Internet works
• The World Wide Web
• Electronic commerce
• Web publishing
• Other Internet services
• Netiquette

Chapter 2 Complete