Chapter Objectives 1 of 3

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- Identify the basic components of a communications system
- Describe how and why network computers are used in schools and school districts
- Explain how the Internet works

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- Describe the educational implications of the Internet and the World Wide Web
- Describe different ways to connect to the Internet and the World Wide Web
- Describe the pros and cons of Web 2.0 tools for teachers and students

What Is Communications?

- A process in which two or more computers or devices transfer data, instructions, and information
- Sometimes called telecommunications

What Is Communications?

- Electronic mail (e-mail)
- Voice mail
- Facsimile (fax)
- Telecommuting
- Online services
- Videoconferencing
- Internet
- World Wide Web
Communications Networks

- Basic communications system
  - Two computers, one to send and one to receive data
  - Communications devices that send and receive data
  - A communications channel over which data is sent

Communications Networks

- Communications channel
  - Transmissions media
    - Twisted-pair cable

Communications Networks

- Digital vs. analog signals
  - Dial-up Modem
    - External modem
    - Internal modem
  - Network interface cards

Communications Networks

- Local Area Networks (LAN)
  - Covers limited geographical area
  - Server manages resources
- Wide Area Networks (WAN)
  - Covers large geographical area
  - Can consist of several LANs

Home Networks

- Connects multiple computers in your home or home office
- Share Internet access
- Share peripherals
- Can be wired or wireless

Networking the Classroom, School, and District

- School network server
- Example classroom
  - Three Macintosh computers
  - Printer
Networking the Classroom, School, and District

- Example school network
  - Classrooms
  - Administration
  - Computer lab

Networking the Classroom, School, and District

- Wireless schools and classrooms
  - Keep in touch with family and friends from anywhere
    - Smart phones
    - Handheld or netbook computers
    - Notebook computers
  - Wireless technology brings the computer lab to students

Networking the Classroom, School, and District

- High-Speed or Broadband Access
  - Government works to provide high speed Internet access to classrooms
  - Broadband technology transmits signals at much faster speeds

The Benefits of Computer Networks in Education

- Sharing of computer hardware, software, and data resources
- Unlimited educational resources
- Communicate with other educators and students

What Is the Internet?

- Worldwide group of connected networks that allow public access to information and services
- No single organization owns or controls
- Estimated over one billion users
- Variety of users
History of the Internet

- Started as a network of four computers at the University of California at Los Angeles in 1969
- Advanced Research Projects Agency (ARPA) – ARPANET
- More than 350 million host computers today
- Backbone first provided by National Science Foundation (NSF) – NSFnet

Backbone now provided by variety of corporations
Various organizations help define standards
Internet2 (I2)
  - Extremely high-speed network
  - Develop and test latest Internet technologies
  - Members include more than 200 universities in the United States, along with 115 companies

How the Internet Works

- Data is divided into packets
- Routers send packets across the Internet
- At the destination, the packets are reassembled into the original message
- Transmission control protocol/Internet protocol (TCP/IP) is the communications protocol used by the Internet

Internet Access Providers
- Have permanent connections to the Internet
- Provide temporary connections to individuals and companies for a fee
- Regional and national ISPs
- Online service providers offer members only areas

Connecting to the Internet
- Business or school network connected to the Internet
- Dial-up access
- Cable TV (CATV)
- Digital subscriber line (DSL)
- Public Internet access point

The Internet Backbone Acts as a Highway
- National ISPs use dedicated lines to connect directly to the Internet
- Regional ISPs connect through leased lines to national ISPs
How the Internet Works

- Internet Addresses
  - Numeric addresses
  - Domain name
    - Domain type abbreviations
    - Country code abbreviations
  numeric address: 198.80.146.30
  domain name: www.scsite.com

The World Wide Web

- Started in the early 1990s
- Hyperlinks
- Uniform Resource Locator (URL)
- Hypertext transfer protocol

How the Internet Works

- Domain type abbreviations
- Country code abbreviations

The World Wide Web

- How a Web Page Works
  - Hypertext
    - Contains hyperlinks to other documents
  - Hyperlinks
    - Target-link to location on same document
    - Relative-link to page within same website
    - Absolute-link to page on another website

The World Wide Web

- Web Browser Software (IE or Firefox)
  - Interprets HTML and displays Web pages and enables you to link to other Web pages and Web sites
  - Also interprets:
    - XHTML
    - XML
    - CSS

The World Wide Web

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The World Wide Web

- Searching for Information on the Web
  - Directory maintained by a search engine company
  - Helps find information on the Web
  - Search engine-finds websites
  - Subject directory-browse subjects without entering keywords (see special feature article for this chapter)

Chapter 2: Communications, Networks, the Internet, and the World Wide Web

The World Wide Web

- Multimedia on the Web
  - Web pages incorporate graphics, animation, audio, video, and virtual reality
  - Plug-ins

<table>
<thead>
<tr>
<th>Tool/Software</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Reader</td>
<td>View, navigate, and print Portable Document Format PDF files. This document browser is a plug-in you can plug in.</td>
</tr>
<tr>
<td>QuickTime</td>
<td>QuickTime is a file format for digital video and animation. The media player can be used to play QuickTime clips.</td>
</tr>
<tr>
<td>Java</td>
<td>Java is an object-oriented, public-domain virtual machine that runs applications on the Web. It is client-based, meaning that the client machine runs the Java code.</td>
</tr>
<tr>
<td>GIF</td>
<td>GIF is the standard file format for animation. It is a lossless format and is used to compress a large number of small color images.</td>
</tr>
<tr>
<td>Shockwave</td>
<td>Shockwave is a multimedia platform from Macromedia that can be used to add interactive multimedia content to Web pages.</td>
</tr>
<tr>
<td>RealPlayer</td>
<td>RealPlayer is a streaming audio and video player for RealAudio and RealVideo streams.</td>
</tr>
<tr>
<td>Windows Media Player</td>
<td>Windows Media Player is the media player for the Windows operating system. It supports all of the most popular audio and video formats, as well as streaming audio and video.</td>
</tr>
</tbody>
</table>

Chapter 2: Communications, Networks, the Internet, and the World Wide Web

The World Wide Web

- Multimedia on the Web
  - Graphics
    - Used to enhance text-based Internet
    - Graphics formats

<table>
<thead>
<tr>
<th>File Extension</th>
<th>Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>.bmp</td>
<td>Bitmap</td>
<td>Desktop background, scanned images</td>
</tr>
<tr>
<td>.gif</td>
<td>Graphics Interchange Format</td>
<td>Simple diagrams, shapes, images with a few colors</td>
</tr>
<tr>
<td>.jpg</td>
<td>Joint Photographic Experts Group</td>
<td>Digital camera photos</td>
</tr>
<tr>
<td>.png</td>
<td>Portable Network Graphics</td>
<td>Web graphics</td>
</tr>
<tr>
<td>.tif</td>
<td>Tagged Image File Format</td>
<td>Photos used by printing industry</td>
</tr>
</tbody>
</table>

Chapter 2: Communications, Networks, the Internet, and the World Wide Web

The World Wide Web

- Multimedia on the Web
  - Animation
    - Marquees-scrolling text across the screen
    - Animated GIFs

Chapter 2: Communications, Networks, the Internet, and the World Wide Web

The World Wide Web

- Multimedia on the Web
  - Audio
    - MP3, WAV, WMA, RealAudio, and QuickTime
    - Players
    - Streaming audio
    - Podcasting
    - RSS

Chapter 2: Communications, Networks, the Internet, and the World Wide Web

The World Wide Web

- Multimedia on the Web
  - Video
    - Streaming video
The World Wide Web

- Multimedia on the Web
- Virtual Reality
  - Simulation of real or imagined environment that appears as a three-dimensional (3-D) space
  - VR worlds

Other Internet Services

- E-mail
  - Primary communication method for both personal and business use
  - E-mail programs
    - Mailbox
    - Mail server
    - E-mail address
    - User name

- FTP (file transfer protocol)
  - FTP sites and servers
  - Allows file downloads and uploads
  - Anonymous FTP
  - FTP programs

- Newsgroups and Message Boards
  - Online area in which users conduct written discussions about a particular subject
    - Usenet
    - News server
    - Article
    - Posting
    - Threaded discussion
    - Message board

- Mailing Lists
  - Group of e-mail names and addresses given a single name
  - Subscribing and unsubscribing
  - LISTSERVs

- Instant Messaging
  - See when one or more people are online
  - Exchange messages and files
  - Join a private chat room
  - Text messaging
  - Short Message Service (SMS)
Other Internet Services

- Chat Rooms
  - Real-time conversation
  - Chat rooms
  - Chat clients

Other Internet Services

- Voice Over IP (VoIP)
  - Also called Internet telephony
  - Uses the Internet to connect calling parties
    - Low cost (less than $20 a year)
    - magicJack (provides software and electronics for annual fee)

Netiquette

- Internet etiquette
  - The code of acceptable behaviors users should follow while on the Internet

Internet Security

- Firewall
  - Filtering software
  - Acceptable Use Policy (AUP)

The Impact of the Internet and the World Wide Web on Education

- The Web is the Gutenberg printing press of modern times
- Collaboration with other teachers and students
  - ePALS
- New instructional strategies

The Future of the Internet and the World Wide Web

- The Web will continue to evolve as the primary communications channel for people around the world
- By 2012, more than two billion wireless communication devices will be in use worldwide, and many of these products will have the ability to access the Web wirelessly
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Chapter 2 Complete

Communications, Networks, the Internet, and the World Wide Web