The Internet

The Internet

- The **Internet**, also called the *Net*, is a world-wide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals.

- The World Wide Web, or simply the Web, and e-mail are two of the more widely used Internet services.

Evolution of the Internet

- Advanced Research Projects Agency (ARPA), a part of the U.S. Department of Defense built a network that:
  - Allowed scientists at different physical locations to share information and work together on military and scientific projects
  - Could function even if part of the network were disabled or destroyed
- *ARPANET* became functional in September 1969, linking scientific and academic researchers.

Evolution of the Internet

- ARPANET underwent phenomenal growth after researchers realized the great benefit.
- By 1984, more than 1,000 individual computers were linked as hosts.
- In 1986, the National Science Foundation (NSF) connected its huge network of five supercomputer centers, called *NSFnet*, to ARPANET, and became known as the Internet.

Evolution of the Internet

- Until 1995, NSFnet handled the bulk of the communications activity, or **traffic**, on the Internet.
- Today, public and private organizations own the internet.
- The World Wide Web Consortium (*W3C*) oversees research and sets standards and guidelines for many areas of the Internet.

Internet2

- Internet2 is a not-for-profit research and development project that connects more than 200 universities and 115 companies via a high-speed private network.
- Examples: telemedicine, digital libraries, and faster Internet services.

Connecting to the Internet

- With *broadband* Internet service, your computer or mobile device usually is connected to the Internet the entire time it is powered on.
  - *Cable Internet service*
  - *DSL*
  - *Fiber to the Premises (FTTP)*
  - *Cellular radio network*
  - **Wi-Fi**
  - *Satellite Internet service*

Access Providers

- An **access provider** is a business that provides individuals and organizations access to the Internet free or for a fee.
- An **ISP** (**Internet service provider**) is a regional or national access provider.
- A *regional ISP* usually provides Internet access to a specific geographic area.
- A *national ISP* is a business that provides Internet access in cities and towns nation wide.

Access Providers

- An **online service provider** (**OSP**) also has many members-only features such as instant messaging or their own customized version of a Web browser. (AOL and MSN)

- A **wireless Internet service provider** (WISP) is a company that provides wireless Internet access to desktop and notebook computers and mobile devices with built-in wireless capability or computers with wireless modems.

How Data and Information Travel the Internet

- Computers connected to the Internet work together to transfer data and information around the world using servers and clients and various wired and wireless transmission media, collectively known as the *Internet backbone.*

Internet Addresses

- An **IP address**, short for Internet Protocol address, is a number that uniquely identifies each computer or device connected to the Internet.
- It is consisted of four groups of numbers (0-255) separated by a period.
  - 72.14.207.99
- These addresses are difficult to remember, so a **domain name** is used as a text version of an IP address.
  - www.google.com

Internet Addresses

- The Internet Corporation for Assigned Names and Numbers (*ICANN*) assigns and controls *top-level domains (TLDs).*

| Examples of Generic Top-Level Domains	
Generic TLD	**Intended Purpose**
aero	Aviation community members
biz	Businesses of all sizes
cat	Catalan cultural community
com	Commercial organizations, businesses, and companies
coop	Business cooperatives such as credit unions and rural electric co-ops
edu	Educational institutions
gov	Government agencies
info	Business organizations or individuals providing general information
jobs	Employment or human resource businesses
mil	Military organizations
mobi	Delivery and management of mobile Internet services
museum	Accredited museums
name	Individuals or families
net	Network providers or commercial companies
org	Nonprofit organizations
pro	Certified professionals such as doctors, lawyers, and accountants
tel	Internet communications
travel	Travel industry

Internet Addresses

- You register a domain name from a *registrar*, which is an organization that sells and manages domain names.

- The *domain name system (DNS)* is the method that the Internet uses to store domain names and their corresponding IP addresses.

- When you specify a domain name, a **DNS server** translates the domain name to its associated IP address so that data and information can be routed to the correct computer.

Internet Addresses

- A new IP addressing scheme, called *IPv6*, is used to increase the number of available IP addresses since the current system is running out.

Free /8
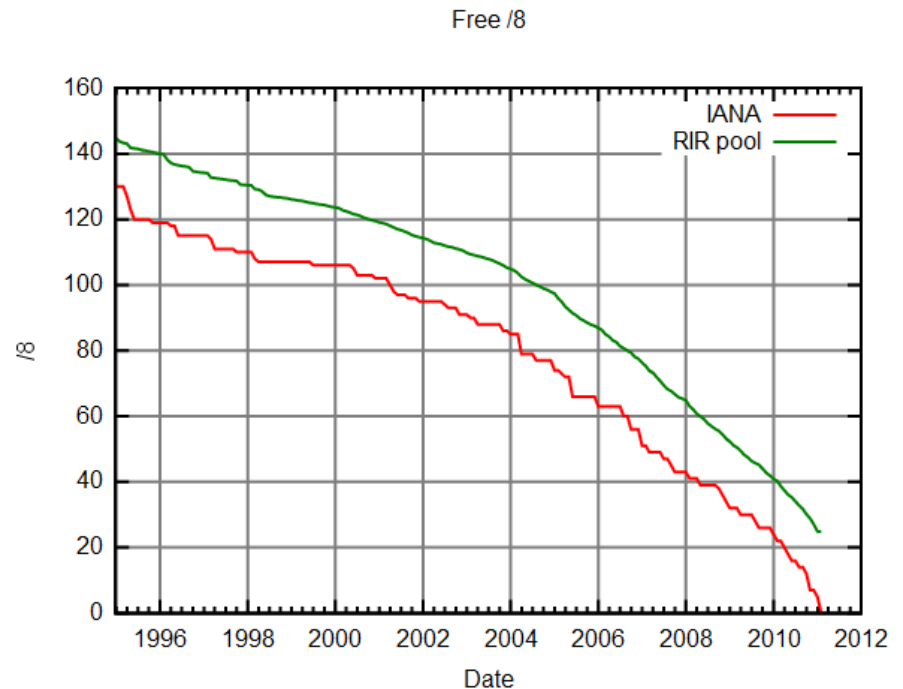
The World Wide Web

- The **World Wide Web** (*WWW*), or **Web**, consists of a worldwide collection of electronic documents.

- Each electronic document on the Web is called a **Web page**, which can contain text, graphics, animation, audio, and video.
  - *Static Web pages* all display the same content.
  - *Dynamic Web pages* have customized content.

The World Wide Web

- A **Web site** is a collection of related Web pages and associated items, such as documents and pictures stored on a Web server.

- A **Web server** is a computer that delivers requested Web pages to your computer.

- A **Web 2.0** site refers to Web sites that provide a means for users to share personal information, modify Web site content, and have application software built into the site for visitors to use.

Browsing the Web

- A **Web browser**, or **browser**, is application software that allows users to access and view Web pages or access Web 2.0 programs.

- To browse the Web, you need a device with an Internet connection and a Web browser, such as Internet Explorer, Firefox, Opera, Safari, or Google Chrome.
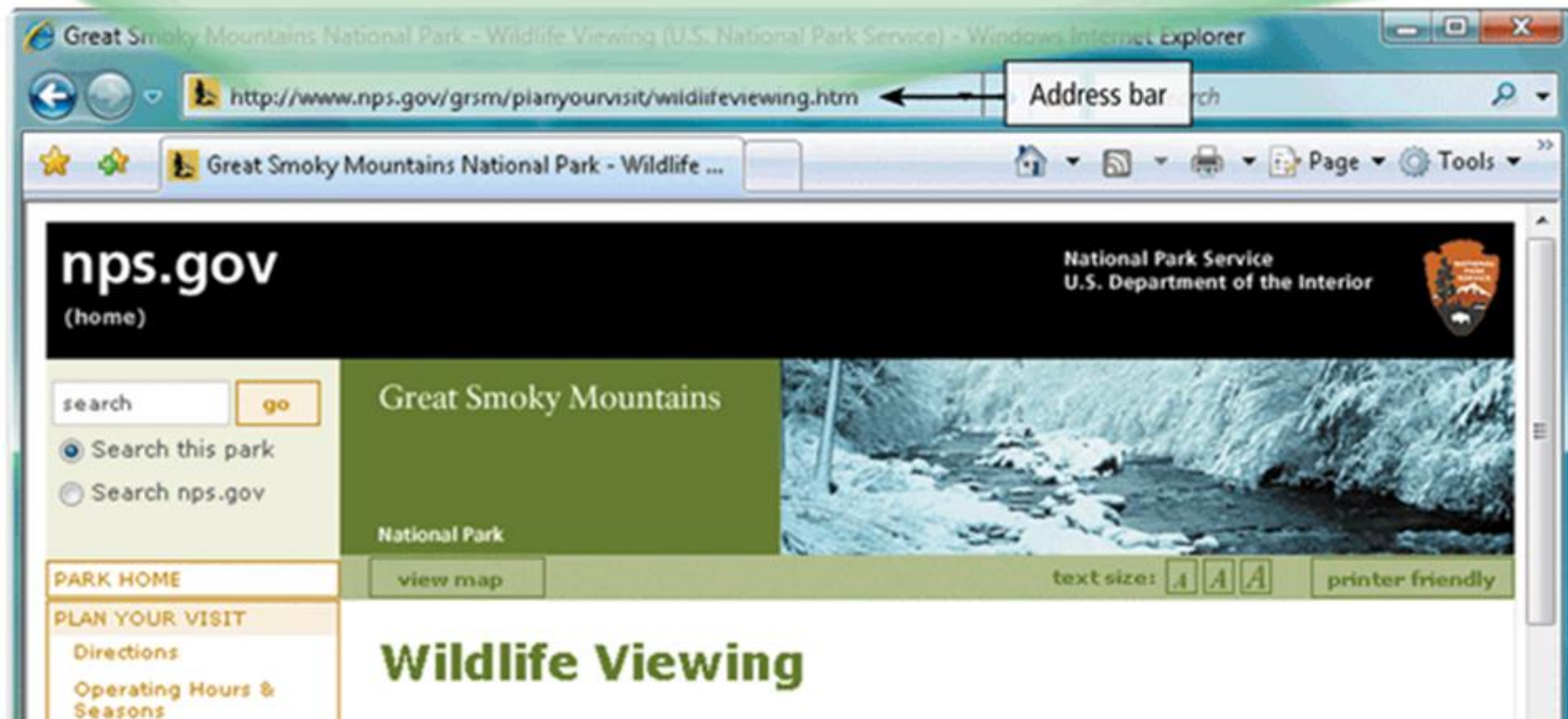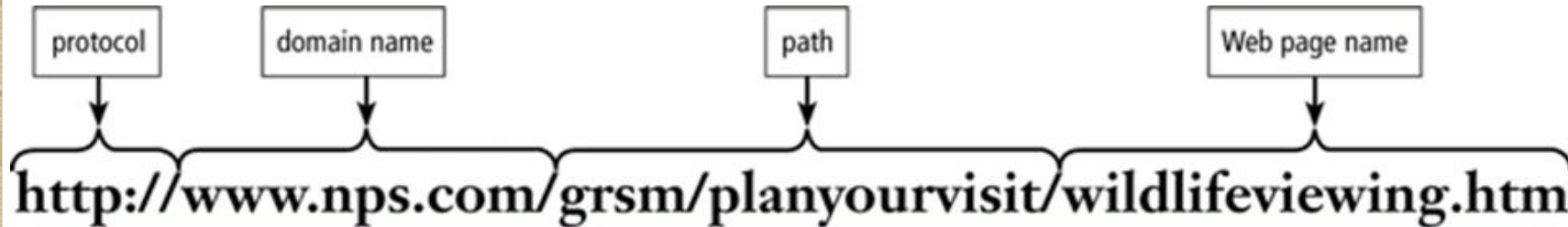
Browsing the Web

- **Home page** refers to the first page that a Web site displays when you open a browser.

- A **link**, short for *hyperlink*, is a built-in connection to another related Web page or part of a Web page.

- **Downloading** is the process of a computer or device receiving information, such as a Web page, from a server on the Internet.

Web Addresses

- A Web page has a unique address, called a **URL** (*Uniform Resource Locator*) or **Web address**.

- If you know the Web address of a Web page, you can type it in to the Address bar at the top of the browser window.

- To save time, many users create *bookmarks,* or *favorites*, for their frequently visited Web pages, which are saved Web addresses that you access by clicking its name on a list.

Web Addresses

protocol	domain name	path	Web page name

http://www.nps.com/grsm/planyourvisit/wildlifeviewing.htm

Great Smoky Mountains National Park - Wildlife Viewing (U.S. National Park Service) - Windows Internet Explorer

http://www.nps.gov/grsm/planyourvisit/wildlifeviewing.htm ← Address bar

Great Smoky Mountains National Park - Wildlife ...

Page ▼ Tools ▼

nps.gov
(home)

National Park Service
U.S. Department of the Interior

search | go

● Search this park
○ Search nps.gov

Great Smoky Mountains

National Park

PARK HOME

view map

text size: A A A   printer friendly

PLAN YOUR VISIT

Directions

Operating Hours &
Seasons

Wildlife Viewing

Navigating Web Pages

- *Hypertext* refers to links in text-based documents, whereas *hypermedia* combines text-based links with graphic, audio, and video links.
- Branching from one related topic to another in a nonlinear fashion is what makes links powerful.
- **Surfing the Web** refers to the activity of using links to explore the Web.

Navigating Web Pages

- Links can be (often underlined, blue) text or images and (often) display a pointing index finger when the mouse hovers over.
- Most current Web browsers support **tabbed browsing**, where the top of the browser displays a tab for each Web page you open.

Navigating the Web

Searching the Web

- A **search engine** is a program that finds Web sites, Web pages, images, videos, news, maps, and other information related to a specific topic.

- A **subject directory** classifies Web pages in an organized set of categories, such as sports or shopping, and related subcategories.

Search Engines

- Search engines require that you enter a word or phrase, called **search text** or *search query*, that describes the item you want.

- Each word in the search is known as a *keyword*.

Search Engines

How to Use a Search Engine

Step 1

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

Step 2

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

Step 4

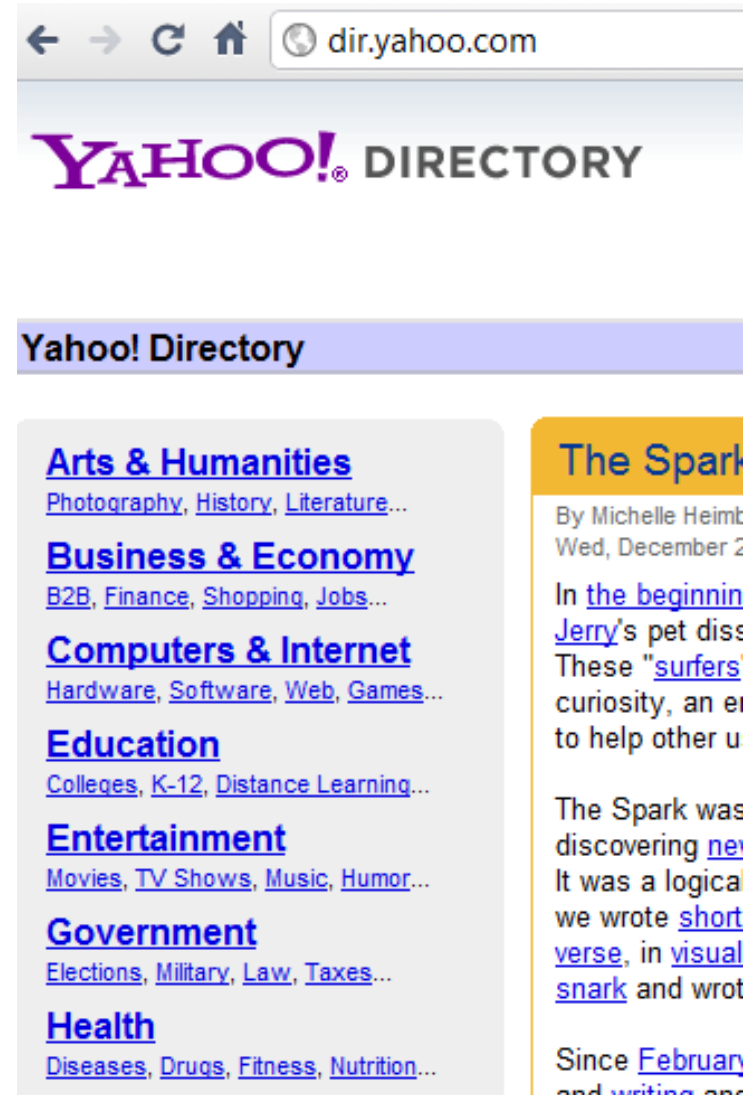Click the Aspen Snowmass link to display a Web page with a description and links to skiing in Aspen.

Step 3

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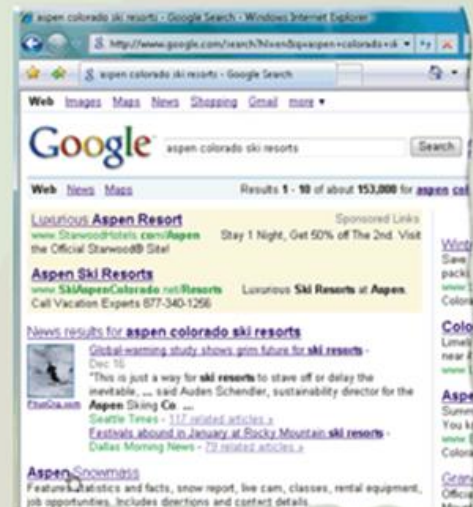
Subject Directories

- Provides categorized lists of links arranged by subject.

Types of Web Sites

- Many Web sites fall in more than one of the following categories:

Portal

- A **portal** is a Web site that offers a variety of Internet services from a single, convenient location.
  - Search engine; news; sports and weather; Web publishing; reference tools such as yellow pages; stock quotes, and maps; shopping; and e-mail and other communication services.
- An **online community** is a Web site that joins a specific group of people with similar interests or relationships.

News

- A news Web site contains newsworthy material including stories and articles relating to current events, life, money, sports, and weather.

Informational

- An informational Web site contains factual information.
  - Examples: census data, tax codes, congressional budget, public transportation schedules, and published research findings.

Business/Marketing

- A business/marketing Web site contains content that promotes or sells products or services.

Blog

- A **blog**, short for *Weblog*, is an informal Web site consisting of time-stamped articles, or posts, in a diary or journal format, usually listed in reverse chronological order.
- A blog that contains video clips is called a **video blog**, or *vlog*.
- The author of a blog is known as a *blogger*.

Wiki

- A **wiki** is a collaborative Web site that allows users to create, add to, modify, or delete the Web site content via their Web browser.
- Many are open to modification by the general public.

Online Social Network

- An **online social network**, also called a **social networking Web site**, is a Web site that encourages members in its online community to share their interests, ideas, stories, photos, music, and videos with other registered users.

- A **media sharing Web site** is a specific type of online social network that enables members to share media such as photos, music, and videos.

Educational

- An educational Web site offers exciting, challenging avenues for formal and informal teaching and learning.

Entertainment

- An entertainment Web site offers an interactive and engaging environment for content such as music, videos, sports, games, ongoing Web episodes, sweepstakes, chat rooms, and more.

Advocacy

- An advocacy Web site contains content that describes a cause, opinion, or idea.

Web Application

- A **Web application**, or *Web app*, is a Web site that allows users to access and interact with software through a Web browser or any computer or device that is connected to the Internet.
- Examples: Google Docs, TurboTax Online, and Windows Live Hotmail.

Content Aggregator

- A *content aggregator* is a business that gathers and organizes Web content and then distributes, or feeds, the content to subscribers for free or a fee.
  - News, music, video, and pictures.
- **RSS 2.0**, which stands for *Really Simple Syndication*, is a specification that some content aggregators use to distribute content.
- *Atom* is another specification like RSS.

Personal

- A private individual or family not usually associated with any organization may maintain a personal Web site or just a single Web page.

Evaluating a Web Site

- Do not assume information on the Web is correct.
- Any person, company, or organization can publish a Web page on the Internet.

Guidelines for Evaluating the Value of a Web Site

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

Multimedia on the Web

- **Multimedia** refers to any application that combines text with graphics, animation, audio, video, and/or virtual reality.

- Multimedia Web pages may need additional software or hardware to function and generally take more time to download.

Graphics

- A **graphic**, or *graphical image*, is a digital representation of non-text information such as a drawing, chart, or photo.
- *JPEG* is a format that compresses graphics to reduce their file size, thus reducing storage space and download speed.
- *GIF* graphics also use compression techniques and is mainly used for logos.
- *PNG* is a newer graphics format that improves upon the GIF format.
- BMP and TIFF are uncompressed and have larger file sizes.
- A *thumbnail* is a small version of a larger graphic that you can usually click to display the full image.

Animation

- **Animation** is the appearance of motion created by displaying a series of still images in sequence.
- An *animated GIF* combines several GIF images in a single GIF file.

Audio

- **Audio** includes music, speech, or any other sound.
- The **MP3** format reduces an audio file to about one-tenth its original size, while preserving much of the original quality.
- Most current operating systems contain a **player**, which is used to listen to an audio file on your computer.
- **Streaming** is the process of transferring data in a continuous and even flow.

Video

- **Video** consists of full-motion images that are played back at various speeds.

- Most have accompanying audio.

- The Moving Pictures Experts Group (*MPEG*) defines a popular video compression standard, known as *MPEG-4* or *MP4*.

- As with streaming audio, *streaming video* allows you to view longer or live video images as they download to your computer.
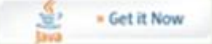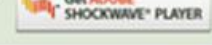
Virtual Reality

- **Virtual reality** (**VR**) is the use of computers to simulate a real or imagined environment that appears as a three-dimensional space.
- Examples: A tour of a house for sale, models of molecules, organisms, and other structures.

Plug-ins

- A **plug-in**, or *add-on*, is a program that extends the capability of a browser.

Popular Plug-Ins

Plug-In Application		Description	Web Address
Acrobat Reader	Get ADOBE® READER®	View, navigate, and print Portable Document Format (PDF) files — documents formatted to look just as they look in print	adobe.com
Flash Player	Get ADOBE® FLASH® PLAYER	View dazzling graphics and animation, hear outstanding sound and music, display Web pages across an entire screen	adobe.com
Java	Java • Get it Now	Enable Web browser to run programs written in Java, which add interactivity to Web pages	java.com
QuickTime	H.264	View animation, music, audio, video, and VR panoramas and objects directly on a Web page	apple.com
RealPlayer	realPlayer FREE	Listen to live and on-demand near-CD-quality audio and newscast-quality video, stream audio and video content for faster viewing, play MP3 files, create music CDs	real.com
Shockwave Player	Get ADOBE® SHOCKWAVE® PLAYER	Experience dynamic interactive multimedia, 3-D graphics, and streaming audio	adobe.com
Silverlight	Silverlight	Experience high-definition video, high-resolution interactive multimedia, and streaming audio and video	microsoft.com
Windows Media Player	Windows MediaPlayer 11 FREE	Listen to live and on-demand audio, play or edit WMA and MP3 files, burn CDs, and watch DVD movies	microsoft.com

Web Publishing

- **Web publishing** is the development and maintenance of Web pages.

  1. Plan a Web Site
  2. Analyze and design a Web site
  3. Create a Web site
  4. Deploy a Web site
  5. Maintain a Web site

E-Commerce

- **E-commerce**, short for *electronic commerce*, is a business transaction that occurs over an electronic network such as the Internet.
- Popular uses are retail, finance, travel, entertainment, and health.

E-Commerce

- *Business-to-consumer (B2C) e-commerce* consists of the sale of goods and services to the general public.
- A consumer visits an online business through an **electronic storefront**, which contains product descriptions, images and a shopping cart.
- The **shopping cart** allows the customer to collect purchases until they complete the sale.

E-Commerce

- *Consumer-to-consumer (C2C) e-commerce* occurs when one consumer sells directly to another, such as in an online auction.
- With an **online auction**, users bid on an item being sold by someone else, and the highest bidder wins.
- *Business-to-business (B2B) e-commerce* takes place between two businesses and often provide goods and services, such as advertising.

Other Internet Services

- E-mail
- Mailing lists
- Instant messaging
- Chat rooms
- VoIP
- Newsgroups and message boards
- FTP

E-Mail

- **E-mail** (short for *electronic mail*) is the transmission of messages and files via a computer network.
- You use an **e-mail program** to create, send, receive, forward, store, print, and delete e-mail messages.
  - Outlook and Windows Mail are desktop programs.
  - Gmail and Windows Live Hotmail are free e-mail web applications.

E-Mail

- The message can be simple text or can contain attachments such as photos, music, videos, or documents.

- An **e-mail address** is a combination of a user name and a domain name that identifies a user so that he or she can receive Internet e-mail.

- Most e-mail programs allow you to create an **address book**, or contacts folder, which contains a list of names and e-mail addresses.

E-Mail

- *SMTP* (simple mail transfer protocol) is a communications protocol used by some outgoing mail servers.
- *POP3,* the latest version of the *Post Office Protocol,* is a communications protocol used by some incoming mail servers.

E-Mail

How an E-Mail Message May Travel from a Sender to a Receiver

Step 1
Using an e-mail program, you create and send a message.

Step 2
Your e-mail program contacts software on your service provider's outgoing mail server.
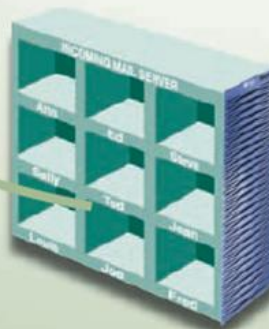
Step 3
Software on the outgoing mail server determines the best route for the data and sends the message, which travels along Internet routers to the recipient's incoming mail server.

Internet router

Step 4
When the recipient uses an e-mail program to check for e-mail messages, the message transfers from the incoming mail server to the recipient's computer.

Internet service provider's incoming mail server

Internet router

Mailing List

- A **mailing list**, also called a distribution list, is a group of e-mail names and addresses given a single name.
- When a message is sent, everyone on the list receives a copy of the message.
- To add your e-mail name to a mailing list, you **subscribe** to it.
- To remove your name, you **unsubscribe** from the mailing list.

Instant Messaging

- **Instant messaging** (**IM**) is a real-time Internet communication service that notifies you when one or more people are online and then allows you to exchange messages or files or join a private chat room.
- **Real time** means that you and the people with whom you are conversing are online at the same time.
- To use IM, you must have *instant messenger* software, such as AIM, Google Talk, etc.

Chat Room

- A **chat** is a real-time typed conversation that takes place on a computer.

- A **chat room** is a location on an Internet server that permits users to chat with each other.

- To start a chat session, you connect to a chat server through a program called a *chat client.*

VoIP

- **VoIP**, or *Voice over IP*, also called *Internet telephony*, enables users to speak to other users over the Internet, rather than the public switched telephone network.
- To place a call, you need a high-speed connection, Internet telephone service, and proper hardware and software.

Newsgroups and Message Boards

- A **newsgroup** is an online area in which users have written discussions about a particular subject.
- A *thread* or *threaded discussion* consists of the original article and all subsequent related replies.
- They require a program called a *newsreader* to check the news on the news server.
- A popular Web-based type of discussion group that does not require a newsreader is a **message board**.

FTP

- **FTP** (File Transfer Protocol) is an Internet standard that permits file uploading and downloading with other computers on the Internet.
- **Uploading** is the process of transferring documents, graphics, and other objects from your computer to a server on the Internet.

Netiquette

- **Netiquette**, which is short for Internet etiquette, is the code of acceptable behaviors users should follow while on the Internet.

- Includes rules for all aspects of the Internet, including WWW, e-mail, IM, chat rooms, FTP, and newsgroups.