

1 Computer, Internet, and Network Basics

2 Computer Basics

- ◆ A computer system includes a computer, peripheral devices, and software
- ◆ **Computer** refers to a device that accepts data as input, processes data, stores data, and produces output
- ◆ **Input** means to feed information into a computer
 - words and symbols in a document
 - Numbers for a calculation
 - pictures

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- ◆ **Data** refers to the symbols that represent facts, ideas and objects
- ◆ **Processing** is the way that a computer manipulates data
 - performing calculations
 - sorting lists and numbers
 - drawing graphs
- ◆ A computer processes data in a device called the **central processing unit** (CPU)

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- ◆ A computer stores data so that it will be available for processing
- ◆ **Memory** is an area of a computer that holds data that is waiting to be processed and for later use
- ◆ **Storage** is the area where data can be left on a permanent basis

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- ◆ Computer **output** is the results produced by the computer
 - reports
 - documents
 - music
 - graphs
 - pictures
- ◆ An output device displays, prints or transmits the results of processing

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- ◆ A **stored program** means that a series of instructions for a computing task can be loaded into a computer's memory
- ◆ This concept allows you to use your computer for multiple tasks over and over again

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◆ Before:

- Computers are categorized into three main categories from least to most powerful:
 - ◆ **microcomputers**
 - ◆ **minicomputers**
 - ◆ **mainframe computers**

◆ Today:

- A computer is categorized based on its technology, function, size, performance, and cost

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◆ A personal computer is a type of microcomputer designed to meet the computing needs of an individual

- Desktop computers
- Notebook computers
- Cost starts at \$500, but most spend \$1000 to \$1500

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◆ A **handheld computer** is one that is designed to fit into a pocket, run on batteries, and be used while you are holding it

◆ Also called a **PDA** (Personal Digital Assistant)

- Send and receive e-mail
- Use maps and global positioning
- Maintain expense account
- Make voice calls using cellular service

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◆ The term “workstation” has two meanings

- Powerful desktop models designed for specialized tasks
- Ordinary personal computers connected to a local area network

◆ A **computer network** is two or more computers and other devices that are connected for the purpose of sharing data and programs

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◆ **LAN** (local area network) is simply a computer network that is located within a limited geographical area

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◆ A **videogame system** (i.e. **Sony's Playstation**) is a computer, but typically it has not been considered a computer category because of its history as a dedicated game device that connects to a TV set and provides only a pair of joysticks for input

- ◆ Today's videogame systems are a different story because they contain microprocessors that are equivalent to those found in a fast personal computer

16 What is a Mainframe Computer?

- ◆ A **mainframe** computer is a large and expensive computer that is capable of passing data simultaneously to many users
- ◆ Used by governments to provide centralized storage

17 How powerful is a "Super Computer?"

- ◆ A **supercomputer** is one of the fastest computers in the world
 - Breaking codes
 - Modeling weather systems
 - Simulating nuclear explosions

18 Computer Basics

- ◆ A **server** serves the computers on a network
- ◆ A **client** receives data from a server
- ◆ Any computer can be a server and a client

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- ◆ A **personal computer system** consists of the following:
 - **Computer system unit**
 - **Display device**
 - **Keyboard**
 - **Mouse**
 - **Floppy disk drive**
 - **Hard disk drive**

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- **CD-ROM or DVD drive**
- **CD-writer**
- **Sound card and speakers**
- **Modem**
- **Printer**

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- ◆ A **peripheral device** designates equipment that might be added to a computer to enhance its functionality
 - Printer
 - Digital camera
 - Scanner
 - Joystick
 - Graphics tablet

24 Computer Basics

- ◆ **Data** is defined as the symbols, raw facts or figures that represent people,

events, things and ideas

- ◆ **Information** is data that is presented in a format people can understand and use
- ◆ Computers store data in **digital** format as a series of 1s and 0s.
 - Each 1 or 0 is called a **bit**
 - Eight bits is called a **byte**

25 Computer Basics

- ◆ A **file** is a named collection of data that exists on a storage medium
- ◆ A **data file** contains data such as the text for a document
- ◆ An **executable file** contains the programs or instructions that tell a computer how to perform a specific task
- ◆ A **filename extension** describes a file's contents
 - EXE
 - GIF

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27 Computer Basics

- ◆ Application software is a set of computer programs that helps a person carry out a task
 - Create, edit, and print documents
 - Manage money accounts
 - Create and edit home movies

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- ◆ An **operating system** is essentially the master controller for all activities that take place within a computer
 - Classified as **system software**

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- ◆ Microsoft Windows
- ◆ Mac OS
- ◆ Linux
- ◆ Unix

30 Computer Basics

- ◆ No. Windows software refers to any application software that is designed to run on computers that use Microsoft Windows as their operating systems
 - Microsoft Word
 - Microsoft Windows XP

31 Computer Basics

- ◆ Two of the most important factors that influence compatibility and define a computer's **platform** are the microprocessor and the operating system
 - **PC's** are based on the design for one of the first personal computer "superstars" – the IBM PC
 - **Macs** are based on a proprietary design for a personal computer called the Macintosh

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33 Internet Basics

- ◆ The **Internet** is a collection of local, regional, national, and international computer networks that are linked together to exchange data and distribute processing tasks
- ◆ The main routes of the Internet are referred to as the **Internet backbone**.
- ◆ Communication between all of the different devices on the Internet is made possible by **TCP/IP** (Transmission Control Protocol/ Internet Protocol)

34 Internet Basics

- ◆ It is estimated that the Internet provides access to more data than is stored in all the academic research libraries in the U. S.
- ◆ Most of the information is stored on servers which are owned and maintained by government agencies, corporations, small businesses, schools, organizations, and even individuals

35 Internet Basics

- ◆ Every computer that connects to the Internet has a unique number called an **IP address**.
- ◆ Information is sent in chunks called **packets**
- ◆ A **router** examines the IP address and then forwards the data to its destination.
- ◆ Packets are reassembled into a replica of the original file

36 Internet Basics

- ◆ **Web Sites** – various locations in cyberspace that correspond to a corporation, a store, a magazine, and more
- ◆ **Search engines** – help catalog a huge portion of the data stored on servers that are connected to the Internet
- ◆ **E-commerce** – online activities such as banking and shopping
- ◆ **E-mail** – electronic messages
 - Mailing list server

37 Internet Basics

- ◆ **Bulletin boards** – discussion groups
 - Usenet
 - Newsgroups
- ◆ **Downloads and uploads**
 - Downloading
 - Uploading

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39 Internet Basics

- ◆ **Chat groups and instant messaging** – interaction between users in real time
- ◆ **Internet telephony** – telephone-style conversations to travel over the Internet to virtually anywhere in the world
- ◆ **Broadcasting** – multicasting technology, can reach all over the world

40 Internet Basics

- ◆ **Remote access and control** – with the right software and passwords, can link two computers together and allow one to control the other
 - Telnet
- ◆ **P2P** – peer-to-peer. It makes direct access of a computer by another available – with permission, of course
 - Gnutella

41 Internet Basics

42 Internet Basics

- ◆ Existing telephone line
- ◆ Cable television line
- ◆ Personal satellite link
- ◆ Wireless or cell phone service
- ◆ High-speed telephone services
 - ISDN, DSL

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- ◆ **Dial-up connection** – is relatively simple and inexpensive because the necessary equipment and software are preinstalled on most new computers
- ◆ **Voice band modem** – converts digital signals into wave format to go over telephone lines and then at destination waves are converted back into digital
- ◆ Dial-up top speed is 56 Kbps

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- ◆ Requires 2 pieces of equipment
 - **Network card** – a device that's designed to connect a personal computer to a local area network
 - **Cable modem** – device that changes computer's signals into a form that can travel over cable TV links

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- ◆ Cable modem access is referred to as an **always-on connection** because your computer is always connected
- ◆ Top speed is around 1.5 Mbps (25 times faster than a dial-up)

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- ◆ Typically schools and business connect to a local area network that is connected to the Internet and these connections are frequently always-on connections

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- ◆ **ISDN** (Integrated Services Digital Network) – 64Kbps or 128 Kbps
- ◆ **DSL** (Digital Subscriber Line) – anywhere from twice as fast to approx. 125 times faster than 56 Kbps
 - Comes from phone company, requires proximity to a switching station

◆ **DSS** (Digital Satellite Service) – 500 Kbps

48 Internet Basics

- ◆ An **ISP** (Internet Service Provider) is a company that maintains Internet computers and telecommunications equipment in order to provide Internet access to businesses, organizations, and individuals
 - An ISP that offers dial-up connections, for example, maintains a bank of modems
 - AOL, Earthlink

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- ◆ A local ISP usually only supplies Internet access within a limited geographical area such as within a particular area code
- ◆ A national ISP supplies access for a large geographical area

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- ◆ Yellow Pages typically list ISPs under “Internet”
- ◆ Newspaper ads
- ◆ Internet Connection Wizard preinstalled on your computer

51 Internet Basics

- ◆ Geographical coverage
- ◆ Type of service
- ◆ Quality of service
- ◆ Cost of monthly service
- ◆ Cost of equipment and installation
- ◆ Extra services
- ◆ Customer service

52 Internet Basics

- ◆ A **user ID** is a series of characters that becomes a person’s unique identifier
- ◆ A **password** is a different series of characters that verifies your identity
- ◆ Some computers are **case-sensitive**, they differentiate between upper and lower case letters

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54 Internet Basics

- ◆ To minimize memorizing 40 user ID’s and passwords, pick a unique user ID that you can use with every system
- ◆ Pick 2 passwords, one for high security, and one for low security
- ◆ Use high security password for critical data and low security for non-critical data

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56 Web Basics

- ◆ **Web** is a collection of files organized as a giant hypertext
 - Hypertext

- ◆ A computer with a domain name is referred to as a **site**
 - yahoo.com
- ◆ **Web site** - location in a computer somewhere on the Internet
 - http://www.yahoo.com

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58 Web Basics

- ◆ **Web server** - computer with special software for transmitting Web pages over the Internet
 - domain names prefixed with www
- ◆ **Home page** - identifies the site and contains links to other pages at the site
- ◆ Web sites are composed of a series of **Web pages**
- ◆ each page stored as a file
 - referred to by a unique URL

59 Web Basics

- ◆ **URL** (Uniform Resource Locator) - an Internet address of a document on a computer
 - begin with http://
- ◆ **HTTP** stands for Hypertext Transfer Protocol - the protocol that allows Web browsers to communicate with Web servers

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- ◆ **Web browsers** provide Internet users with all-purpose client software for accessing many types of servers
 - Internet Explorer
 - Netscape

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- ◆ A browser fetches and displays Web pages
- ◆ The server sends your computer data that's stored
- ◆ The data consists of information that you want to see and **HTML tags**, codes that tell your browser how to display it

63 Web Basics

64 Web Basics

- ◆ URL box
- ◆ Navigation buttons
- ◆ Home button
- ◆ Print
- ◆ Save
- ◆ Copy
- ◆ History List
- ◆ Favorites or Bookmarks

- ◆ Stop button

- ◆ Find

65 Web Basics

66 Web Basics

- ◆ **Search engine** – popularly refers to a Web site that provides a variety of tools to help you find information

- A software program that helps you locate web pages on certain topics
- Enter keywords or descriptions
- AltaVista, Google, Yahoo, etc.

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- ◆ Describes information you want to find

- ◆ A search operator is a word or symbol that describes a relationship between keywords and thereby helps you create a more focused query

- AND, OR, and NOT
- Quotation marks
- NEAR
- Wildcards
- Field Searches

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- ◆ A **topic directory** is a list of topics and subtopics

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73 E-mail Basics

74 E-mail Basics

- ◆ Any person with an e-mail account

- ◆ An **e-mail account** provides the rights to a storage area or “mailbox”

- ◆ Each mailbox has a unique address

- *Greene@rutgers.edu*

75 E-mail Basics

- ◆ An e-mail message is a document that is composed on a computer and remains in digital form so that it can be transmitted to another computer

- ◆ Every message includes a message header and the body of the message, usually displayed in a form

76 E-mail Basics

- ◆ Basic e-mail activities consist of writing, reading, replying to, and forwarding messages

- 77 E-mail Basics
- ◆ After you receive a message, you can use the Forward feature to pass it on to other people
 - ◆ When you initiate the forward process, the original message is copied and then you can enter the address of the person to receive the message, and even add a note about why you are passing it along
- 78 E-mail Basics
- ◆ An **e-mail attachment** is a file that travels with a message to the recipient
 - ◆ A conversion process called **MIME** provides a way of disguising the file as plain ASCII text that can travel over the Internet
- 79 E-mail Basics
- ◆ Most e-mail software allows you to create messages in HTML
 - ◆ This allows your messages to contain fancy formatting and multimedia aspects
- 80 E-mail Basics
- Address book
 - Group e-mails
 - Carbon copy
 - Assign a priority to your e-mail
 - Find a message
 - Enlarge text size
 - Sort messages
 - Refuse messages
 - Automate replies
 - Automatic fetching
 - Spell checking
- 81 E-mail Basics
- ◆ E-mail is similar to old-fashioned letters
 - ◆ E-mail is faster than post office, but lacks immediacy of a telephone conversation
- 82 E-mail Basics
- ◆ Netiquette is online jargon for "Internet etiquette. It is a series of customs or guidelines for maintaining civilized and effective communications on-line
- 83 E-mail Basics
- ◆ An **e-mail system** is the equipment and software that carries and manipulates e-mail messages
 - ◆ E-mail servers sort, store, and route email
 - ◆ **Store-and-forward technology** – a communications method in which data that cannot be sent directly to its destination will be temporarily stored until transmission is possible
 - **POP**
 - **SMTP**
 - **Web-based e-mail**
- 84 E-mail Basics
- 85 E-mail Basics
- ◆ POP server – a computer that stores your incoming messages until they can

be transferred to your hard disk

- ◆ Using POP requires e-mail client software
- ◆ Outgoing mail is routed by an SMTP server

86 E-mail Basics

87 E-mail Basics

- ◆ You can use it offline and on-line
- ◆ It can automatically send messages out over the Internet when online

88 E-mail Basics

- ◆ Requires e-mail client software
- ◆ Transfers e-mail to your computer
- ◆ Consider the following when deciding:
 - Control
 - Security
 - Travel