Chapter 6
Storage

CHAPTER 6 PRIMARY OBJECTIVES

- Differentiate between storage and memory
- Identify various types of storage media and storage devices
- Explain how data is stored on a floppy disk
- Understand how to care for a floppy disk
- Describe how a hard disk organizes data

CHAPTER 6 PRIMARY OBJECTIVES (cont.)

- List the advantages of using disks
- Explain how data is stored on compact discs
- Understand how to care for a compact disc
- Differentiate between CD-ROMs and DVD-ROMs
- Identify uses of tapes, PC Cards, smart cards, microfilm, and microfiche

MEMORY VERSUS STORAGE

- Memory
  - Holds data and instructions while they are being processed by the CPU
  - Volatile
  - Nonvolatile

MEMORY VERSUS STORAGE

- Storage
  - Also called secondary storage, auxiliary storage, or mass storage
  - Holds items such as data, instructions, and information for future use
  - Nonvolatile

MEMORY VERSUS STORAGE

- Storage
  - Reading
  - Writing
  - Access time
  - Capacity
  - Numerous types

FLOPPY DISKS

- Portable
- Inexpensive
- 3.5-inch disks
- Used on many types of computers

FLOPPY DISKS

- Characteristics of Magnetic Media
  - Magnetic
  - Formatting: preparing a floppy disk for use
    - Track
    - Sector
    - Cluster

FLOPPY DISKS

- Characteristics of Magnetic Media
  - Density
  - File allocation table (FAT)

FLOPPY DISKS

- Characteristics of a Floppy Disk
  - Write-protect notch
  - Formatting a disk yourself

FLOPPY DISKS

- Floppy disk drive (FDD)
  - Can read or write a floppy disk
  - How a floppy disk drive works
    - Shutter
    - Read/write head

FLOPPY DISKS

- Care of Floppy Disks
  - Can last seven years
  - Avoid heat, cold, magnetic fields, dust, smoke, and salt air

FLOPPY DISKS

- High-Capacity Floppy Disks
  - 100 MB or greater capacity
  - Store large files such as graphics, audio, or video
  - Used for backups
  - SuperDisk drive
  - Zip drive

HARD DISKS

- Primary media for storing software programs and files
- 4 to 50 GB capacity
- Consists of several platters
- Fixed disks in a personal computer

HARD DISKS

- Characteristics of a Hard Disk
  - Uses magnetic patterns to store data
  - Two formatting steps and partitioning
    - Low-level format
    - Partition
    - High-level format
      - Creates FAT

HARD DISKS

- How a Hard Disk Works
  - Arms move read/write heads to proper location on the platters
  - Location of read/write head is a cylinder
  - Read/write head floats above platter
  - Caching improves performance

HARD DISKS

- Removable Hard Disks
  - Disk is enclosed in a plastic case
  - Easily transported

HARD DISKS

- Hard Disk Controllers
  - Manages flow of data, instructions, and information to and from a disk
  - EIDE
  - SCSI

HARD DISKS

- RAID
  - Redundant Array of Independent Disks
  - Increased reliability through redundancy
  - Expensive
  - Many levels of RAID
    - Mirroring
    - Striping

HARD DISKS

- Maintaining Data Stored on a Hard Disk
  - Preventive maintenance
    - Defragmentation
    - Scanning for errors

COMPACT DISCS

- Used to distribute software packages
- Stores items such as data, instructions, and information
- Uses microscopic pits and land in the middle layer of the disc
- Stores items in spiraling tracks

COMPACT DISCS

- CD-ROM vs. DVD-ROM
- Most computers have CD-ROM or DVD-ROM drive
- Use jewel case to protect
- Guidelines for care of discs

CD-ROMs

- Compact disc read-only memory
- Can contain text, graphics, and video as well as sound
- Cannot be erased or modified
- Use CD-ROM drive or CD-ROM player to read
- Holds about 700 MB
- Used to distribute software

CD-ROMs

- CD-ROM drive speed
  - Data transfer rate
  - Single-speed has a rate of 150 KB per second
  - Current drives from 16X to 40X

CD-ROMs

- Photo CD, CD-R, and CD-RW
  - Multisession
  - PhotoCD
  - CD-R (compact disc-recordable)
  - CD-RW (compact disc-rewritable)

DVD-ROMs

- DVD-ROMs
  - Digital video disc-ROM
  - Can hold much more data than CD-ROMs
    - 4.7 GB to 17 GB
  - Higher quality than CD-ROMs
  - Often used for video

DVD-ROMs

- DVD-ROMs
  - Several storage techniques
    - Higher density
    - More layers
    - Double-sided

DVD-ROMs

- DVD-ROMs
  - DVD variations
    - Digital movies and audio
    - DVD-Recordable
    - Rewritable
    - DVD-RAM

TAPES

- Ribbon with a magnetic coating
- Sequential access
- Tape drive reads tapes
- Reel-to-reel
- Tape cartridge
- External tape drive
- Separate cabinet
- Many types of tape

PC CARDS

- Thin, credit card-sized device that fits into a PC Card expansion slot
- Add storage, memory, communications, and sound capabilities
- Used on laptops and portable computers

PC CARDS

- 3 types
  - Type I and II used to add memory and communications
  - Type III used for hard disks

OTHER TYPES OF STORAGE

- Smart Cards
  - Similar in size to credit card or ATM card
  - Has an embedded microprocessor
  - Intelligent smart card
  - Memory card
  - Prepaid smart cards
  - Electronic money

OTHER TYPES OF STORAGE

- Microfilm and Microfiche
  - Stores microscopic images of documents on roll or sheet film
  - Microfilm
    - 100 to 215-foot roll of film

OTHER TYPES OF STORAGE

- **Microfilm and Microfiche**
  - Stores microscopic images of documents on roll or sheet film
  - Microfilm
    - 100 to 215 -foot roll of film
  - Microfiche
    - Sheet of film usually about four inches by six inches
  - Often used by libraries and banks due to length of life

OTHER TYPES OF STORAGE

- **Enterprise Storage Systems and Data Warehouses**
  - Organize entire company's storage needs
  - Efficiency
  - Storage area network (SAN)
  - Cloud technology – megaservers and thin clients

SUMMARY OF STORAGE

- Memory versus storage
- Floppy disks
- Hard disks
- Compact discs
- CD-ROMs
- Tapes
- PC Cards
- Other types of storage

Chapter 6 Complete