

# Storage device

Computer literacy

# Mass storage



- Process of saving software and data
- Also called mass storage, auxiliary storage, or secondary storage
- Is nonvolatile
- Examples
  - Solid state devices
  - Hard disks
  - Floppy disks (legacy)
  - Flash memory
  - USB drives
  - Optical drives: CDs and DVDs, Blue rays



Hard drive with enclosure opened



Flash memory card in reader



USB drive



DVD

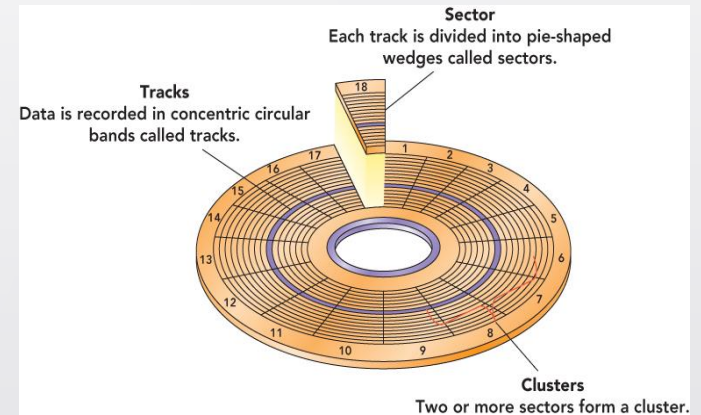
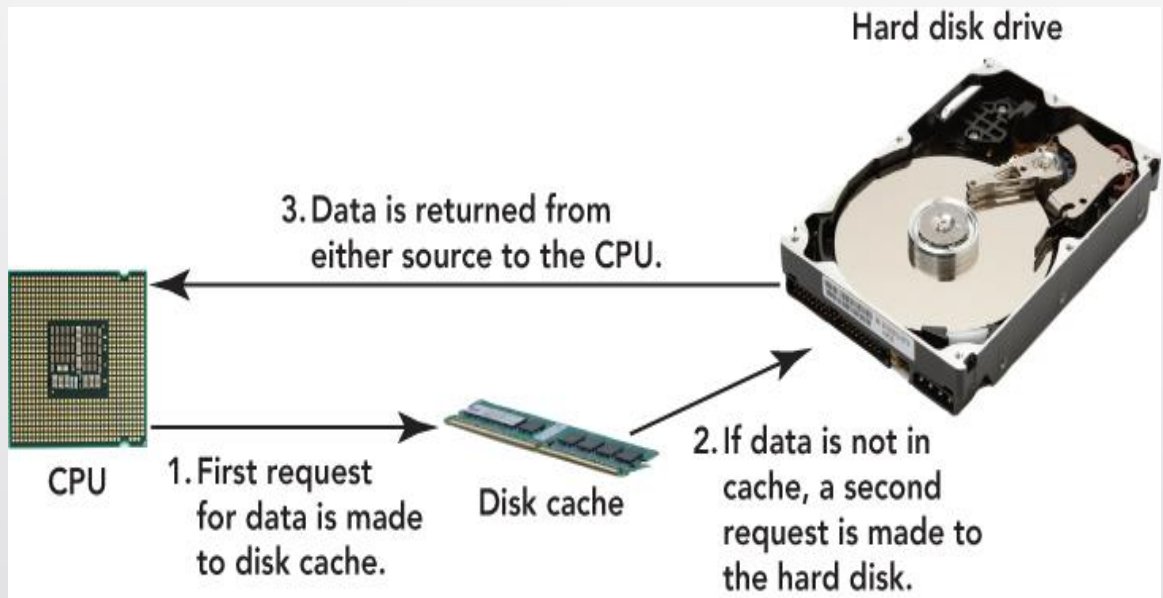
# RAM vs. Mass Storage



- Mass Storage devices retain data even if power is turned off
- Data stored in memory (RAM) will be lost
- Storage devices are less expensive than memory

		Access Speed	Cost per MB	Storage Capacity
Memory	Cache memory	Fastest	Highest	2 MB
	RAM	Fast	High	4 GB
Storage	Hard disk	Medium	Medium	1 TB
	CD-R disc	Slow	Low	700 MB

# Hard DISK drive



# SOLID STATE DRIVE



- Uses a type of memory called “flash memory”
- Flash memory uses a grid of electrical cells to quickly send and receive data.
- These grids are separated into sections called “pages”
- Pages are clumped together to form “blocks.”

# Comparing Solid State Drives to Traditional Hard Drives



- **Spin-up Time:**
  - SSDs have no spin up time; the drive has no moving parts.
- **Data Access Time and Latency:**
  - by skipping the mechanical spin and seek routine they can access data almost instantly wherever it is on the disk
- **Noise:**
  - SSDs are silent; no moving parts means no noise.
- **Reliability**
- **Power Consumption:**
  - SSD drives consume 30-60% less energy than traditional HDDs.
- **Cost:**
  - SSD are not cheap.

# Other Storage Devices



- **Express Card**
  - Notebook accessory—size of a credit card
  - Can be used as a modem, as extra memory, or as a network adapter
- **Flash memory cards**
  - Solid-state storage device
  - Used with MP3 players, smartphones, digital cameras
- **Flash memory reader**
  - Slot or compartment allows access to files stored on the card

# Cloud Storage



- A **service** provided by a company to store your data
- Data is stored on the internet (in the “cloud”), not locally
- Usually requires software installation
- Examples:
  - Drop Box
  - Google Drive
  - Apple iCloud
  - Amazon Drive
  - Microsoft OneDrive