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FACULTY OF ENGINEERING & TECHNOLOGY

BCA-307 Operating System

Lecturer-05

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Storage Structure & Hierarchy

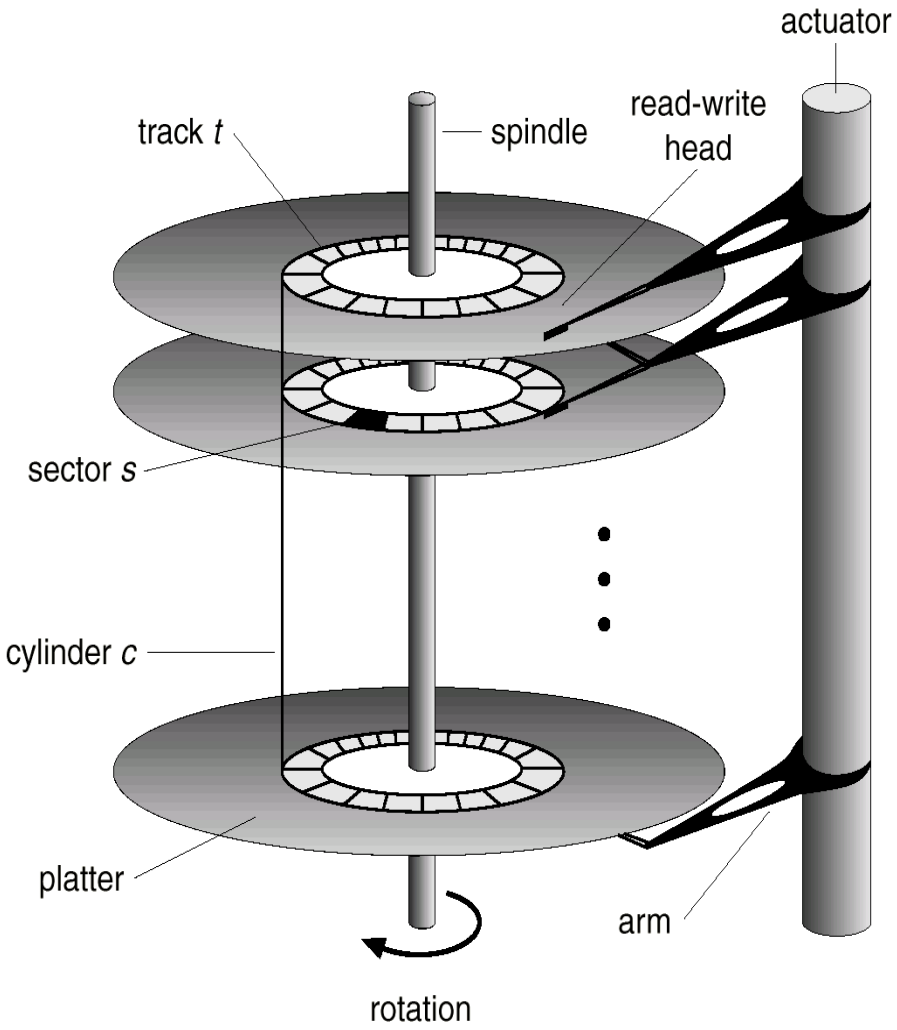
Storage Structure

Main memory – only large storage media that the CPU can access directly

Secondary storage – extension of main memory that provides large nonvolatile storage capacity

Magnetic disks – rigid metal or glass platters covered with magnetic recording material

- ❖Disk surface is logically divided into tracks, which are subdivided into sectors
- ❖The disk controller determines the logical interaction between the device and the computer


actuator
track t
spindle
read-write
head
sector s
cylinder c
platter
arm
rotation

Hardware Protection

•Dual-Mode Operation
•I/O Protection
•Memory Protection
•CPU Protection

•Sharing system resources requires operating system to ensure that an incorrect program cannot cause other programs to execute incorrectly.

Provide hardware support to differentiate between at least two modes of operations.

1. *User mode* – execution done on behalf of a user.
2. *Monitor mode* (also *supervisor mode* or *system mode*) – execution done on behalf of operating system.

Mode bit added to computer hardware to indicate the current mode: monitor (0) or user (1).

When an interrupt or fault occurs hardware switches to monitor mode.

Storage Hierarchy

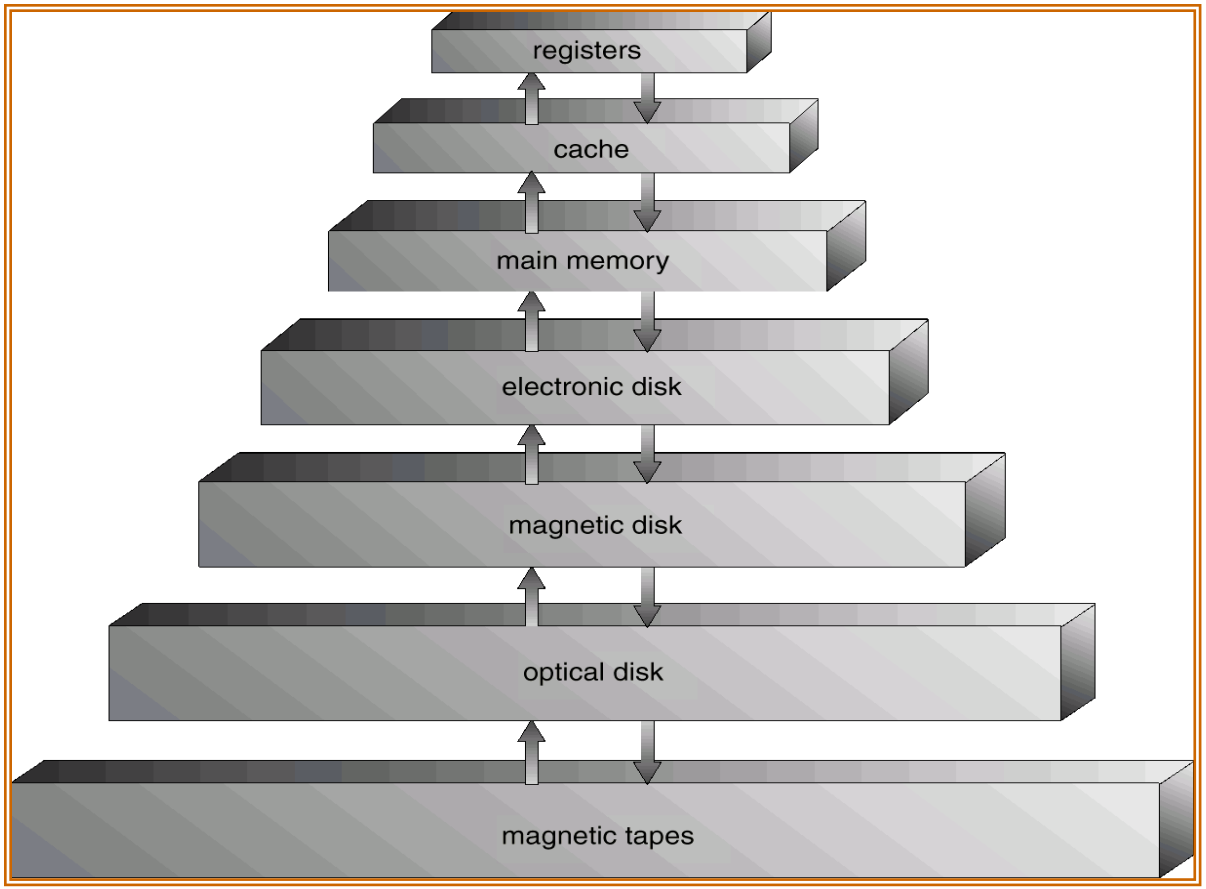
Storage systems organized in hierarchy:-

- Speed
- Cost
- Volatility

Caching –

copying information into faster storage system; main memory can be viewed as a last *cache* for secondary storage

Storage Hierarchy



Caching

Use of high-speed memory to hold recently-accessed data

Requires a *cache management* policy

Caching introduces another level in storage hierarchy.

This requires data that is simultaneously stored in more than one level to be *consistent*

MCQ

……..resources requires operating system to ensure that an incorrect program cannot cause other programs to execute incorrectly.

A. Sharing system
B. Not Sharing system
C. Interleaved system
D. None of these

Main memory –

A. large storage media that the CPU can access directly
B. small storage media that the CPU can access directly
C. large storage media that the kernel can access directly
D. All of these

Caching introduces another level in storage…….

A. hierarchy
B. Structure
C. Variable
D. data

Storage systems organized in hierarchy:-

A. Speed
B. Cost
C. Volatility
D. All of these

Caching…….

A. copying information into faster storage system
B. main memory can be viewed
C. last cache for secondary storage
D. All of these