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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-501 Operating System

Lecturer-34

Manisha Verma
Assistant Professor
Computer Science & Engineering

File System Implementation

File-System Structure
File System Implementation
Layered File System

File System Implementation

- To describe the details of implementing local file systems and directory structures
- To describe the implementation of remote file systems
- To discuss block allocation and free-block algorithms and trade-offs

File-System Structure

- File structure
  - Logical storage unit
  - Collection of related information
- File system resides on secondary storage (disks)
  - Provided user interface to storage, mapping logical to physical
  - Provides efficient and convenient access to disk by allowing data to be stored, located retrieved easily
- Disk provides in-place rewrite and random access
  - I/O transfers performed in blocks of sectors (usually 512 bytes)
- File control block – storage structure consisting of information about a file
- Device driver controls the physical device
- File system organized into layers

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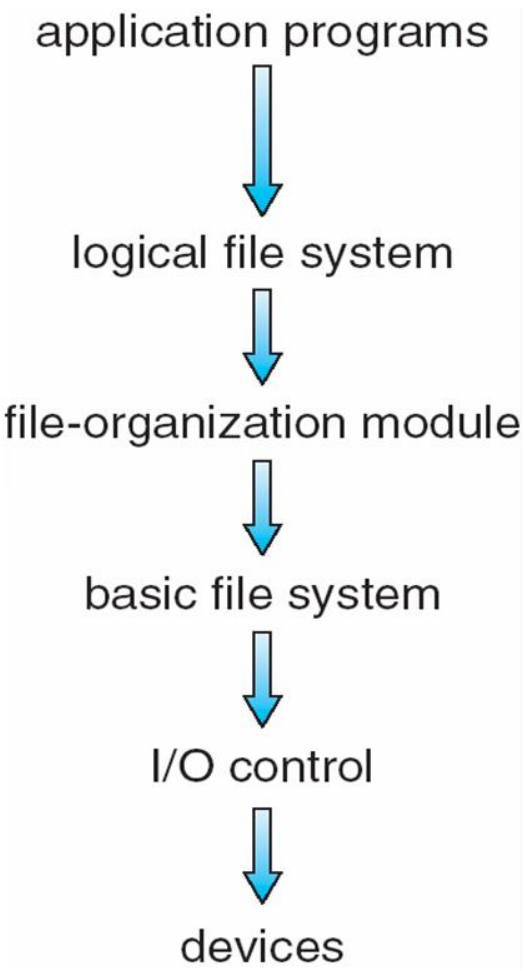
Layered File System



File System Layers

•Device drivers manage I/O devices at the I/O control layer

- •Given commands like “read drive1, cylinder 72, track 2, sector 10, into memory location 1060” outputs low-level hardware specific commands to hardware controller

•Basic file system given command like “retrieve block 123” translates to device driver

•Also manages memory buffers and caches (allocation, freeing, replacement)

- ➢Buffers hold data in transit
- ➢Caches hold frequently used data

•File organization module understands files, logical address, and physical blocks

- Translates logical block # to physical block #
- Manages free space, disk allocation

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File System Layers……

•**Logical file system** manages metadata information

- ➢Translates file name into file number, file handle, location by maintaining file control blocks (inodes in UNIX)
- ➢Directory management
- ➢Protection

•Layering useful for reducing complexity and redundancy, but adds overhead and can decrease performanceTranslates file name into file number, file handle, location by maintaining file control blocks (inodes in UNIX)

- ➢Logical layers can be implemented by any coding method according to OS designer

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MCQ

Groups Can Be Modified And Created In UNIX By ….
A) Any User
B)superuser
C) The People In The Group Only
D) A Programmer Only

By A Password If Each Access To A File Is Controlled, Then The Disadvantage Is That ……..
A) It Is Not Reliable
B) All Of The Mentioned
C) It Is Not Efficient
D)) User Will Need To Remember A Lot Of Passwords

In A Different Level Directory Structure ……..
A) The Subdirectories Do Not Need Protection Once The Directory Is Protected
B) The Same Previous Techniques Will Be Used As In The Other Structure
C) A Mechanism For Directory Protection Will Have To Apply
D) None Of The Mentioned

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The Directory Protection Is Handled In Unix _____ To The File Protection.
A) None Of The Mentioned
B) It Is Not Handled At All
C) Similar
D) Different

In a Group, All Users Get _____ Access To A File.
A) Different
B)same
C) Similar
D) None Of The Mentioned

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