Department of Computer Science and Engineering

FACULTY OF ENGINEERING AND TECHNOLOGY
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CS-501

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EFFICIENCY, PERFORMANCE AND RECOVERY

EFFICIENCY

Efficiency

- *Efficiency* dependent on:
  - Disk allocation and directory *algorithms*
  - Types of *data* kept in file's directory entry
  - Pre-allocation or as-needed allocation of *metadata* structures
  - Fixed-size or varying-size *data structures*

PERFORMANCE

Performance

- *Keeping* data and metadata close together.
- *Buffer cache* – separate section of main memory for frequently used blocks.
- *Synchronous writes* sometimes requested by apps or needed by OS.
  - No buffering / caching – writes must hit disk before acknowledgement.
- *Asynchronous writes* more common, buffer-able, faster.
- Free-behind and read-ahead – techniques to optimize sequential access.

RECOVERY

Recovery

- *Consistency checking* – compares data in directory structure with data blocks on disk, and tries to fix inconsistencies.
  - Can be slow and sometimes fails

- Use system programs to back up data from *disk to another storage device* (magnetic tape, other magnetic disk, optical).

- Recover lost file or disk by *restoring* data from backup.

References

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley.

2. William Stallings, “Operating Systems: Internals and Design Principles”, 6th Edition, Pearson Education.

3. D M Dhamdhere, “Operating Systems: A Concept based Approach”, 2nd Edition, TMH.

Thank You.