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COURSE NAME : 19CSB201 – OPERATING SYSTEMS

II YEAR/ IV SEMESTER

UNIT – IV File Systems

Topic: File Sharing

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File Sharing



- Sharing of files on multi-user systems is desirable
- Sharing may be done through a **protection** scheme
- On distributed systems, files may be shared across a network
- Network File System (NFS) is a common distributed file-sharing method
- If multi-user system
 - **User IDs** identify users, allowing permissions and protections to be per-user
 - **Group IDs** allow users to be in groups, permitting group access rights
 - Owner of a file / directory
 - Group of a file / directory



File Sharing – Remote File Systems

- Uses networking to allow file system access between systems
 - Manually via programs like FTP
 - Automatically, seamlessly using **distributed file systems**
 - Semi automatically via the **world wide web**
- **Client-server** model allows clients to mount remote file systems from servers
 - Server can serve multiple clients
 - Client and user-on-client identification is insecure or complicated
 - **NFS** is standard UNIX client-server file sharing protocol
 - **CIFS** is standard Windows protocol
 - Standard operating system file calls are translated into remote calls
- Distributed Information Systems (**distributed naming services**) such as LDAP, DNS, NIS, Active Directory implement unified access to information needed for remote computing



File Sharing – Failure Modes

- All file systems have failure modes
 - For example corruption of directory structures or other non-user data, called **metadata**
- Remote file systems add new failure modes, due to network failure, server failure
- Recovery from failure can involve **state information** about status of each remote request
- **Stateless** protocols such as NFS v3 include all information in each request, allowing easy recovery but less security



File Sharing – Consistency Semantics

- Specify how multiple users are to access a shared file simultaneously
 - Similar to Ch 5 process synchronization algorithms
 - Tend to be less complex due to disk I/O and network latency (for remote file systems)
 - Andrew File System (AFS) implemented complex remote file sharing semantics
 - Unix file system (UFS) implements:
 - Writes to an open file visible immediately to other users of the same open file
 - Sharing file pointer to allow multiple users to read and write concurrently
 - AFS has session semantics
 - Writes only visible to sessions starting after the file is closed



REFERENCES

TEXT BOOKS:

- T1 Silberschatz, Galvin, and Gagne, “Operating System Concepts”, Ninth Edition, Wiley India Pvt Ltd, 2009.)
- T2. Andrew S. Tanenbaum, “Modern Operating Systems”, Fourth Edition, Pearson Education, 2010

REFERENCES:

- R1 Gary Nutt, “Operating Systems”, Third Edition, Pearson Education, 2004.
- R2 Harvey M. Deitel, “Operating Systems”, Third Edition, Pearson Education, 2004.
- R3 Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.
- R4. William Stallings, “Operating Systems – Internals and Design Principles”, 7th Edition, Prentice Hall, 2011

