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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-501 Operating System

Lecturer-33

Manisha Verma
Assistant Professor
Computer Science & Engineering

File Sharing

File Sharing

File Sharing – Remote File Systems

File Sharing – Failure Modes

File Sharing – Consistency Semantics

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

MCQ

Reliability of files can be enhanced by :
a)by keeping duplicate copies of the file
b) making a different partition for the files
c) by keeping them in external storage
d) keeping the files safely in the memory

security is only provided at the _____ level.
a) none of the mentioned
b) high
c) central
d) lower

The major issue with access control lists is :
a) their maintenance
b) all of the mentioned
c) their permissions
d) their length

Many systems recognize three classifications of users in connection with each file (to condense the access control list) :
a)) Universe
b) Group
c) owner
d) All of the mentioned

security is only provided at the _____ level.
a) none of the mentioned
b) high
c) central
d) lower