

File-Systems

Dr Andrew Scott

a.scott@lancaster.ac.uk

1

Common File System Operations

- Create
- Open
- Read From current position
- Write To current position
- Seek Reposition within file
- Close
- Link Create alias for file (*hard link**)
- Unlink Remove file or alias

* See also symlink, which creates a reference to a file (data lost if orig. file deleted)

2

Common File Attributes

- Name
- Unique Identifier
- File type
- Location
- Size
- Access Control Lists/ Flags
- Time and Date (accessed, modified, ...)
- Ownership (user/ group)

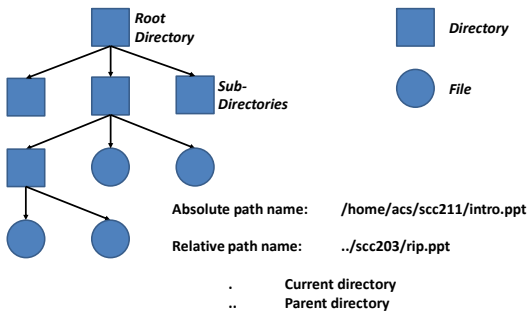
3

Access and Access Control Lists

- Types of access
 - Read, Write, Execute, Append, Delete, List
- Access Control options range between
 - Simple User, Group, Other
 - More complex object-capability based approaches
- Unix: rwx modes for User, Group, Other
- NT: rich set of access permissions

4

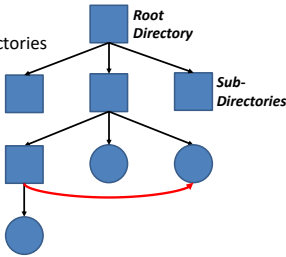
Directories and Files



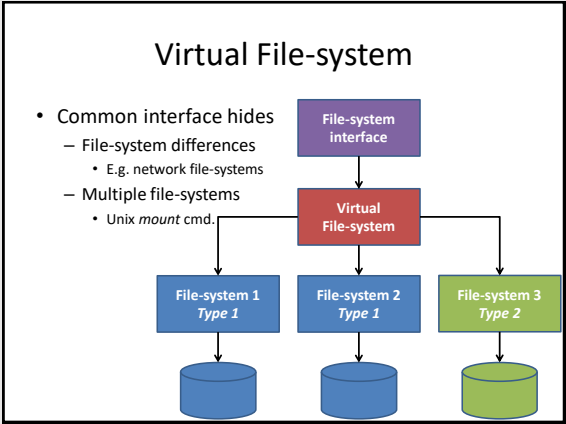
5

Shared Files

- If we allow multiple **links** to a file
 - File-system becomes *Directed Acyclic Graph* (DAG)
- Supporting links to directories would allow loops
 - Processes scanning directories might get trapped
 - Not generally allowed



6



7
