Chaitanya Women's College
(DEGREE & P.G)
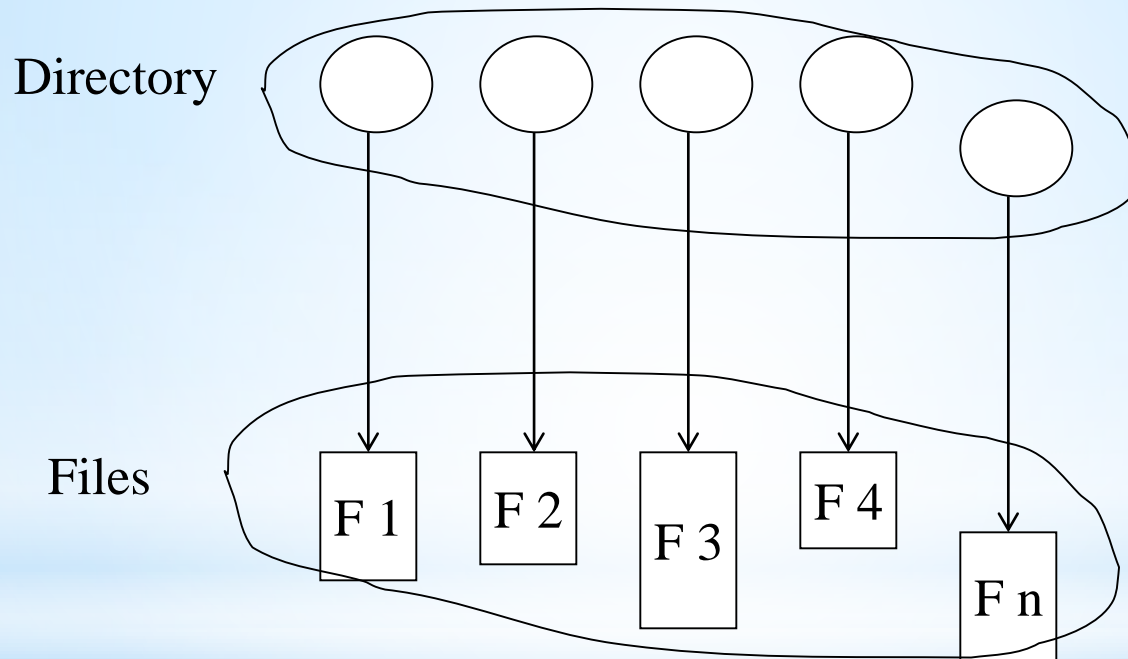Affiliated to Andhra University

OPERATING SYSTEM

DIRECTORY STRUCTURES
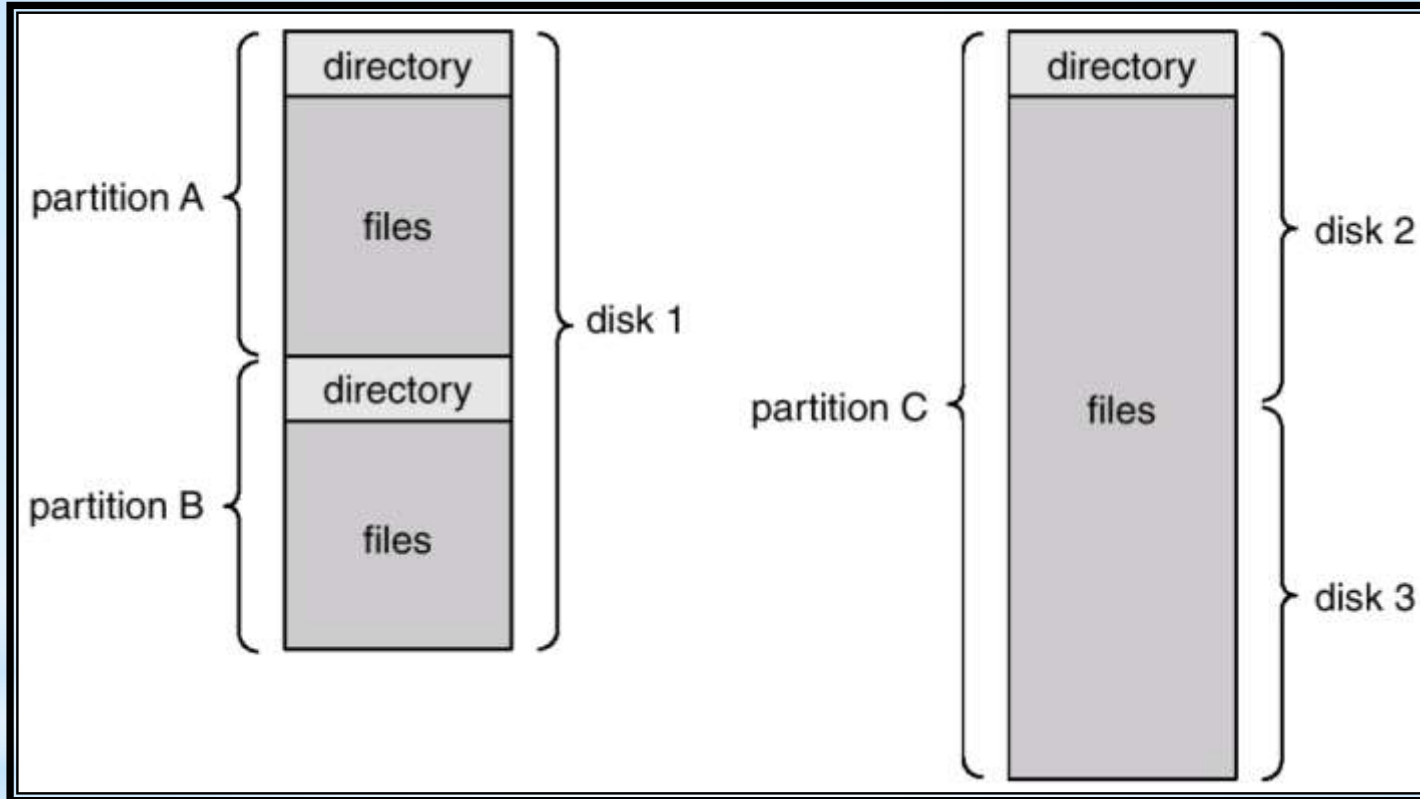
Directory Structure

A collection of nodes containing information about all files.

Directory

Files

Both the directory structure and the files reside on disk.
Backups of these two structures are kept on tapes.

A Typical File-system Organization

Information in a Device Directory

* Name
* Type
* Address
* Current length
* Maximum length
* Date last accessed (for archival)
* Date last updated (for dump)
* Owner ID (who pays)
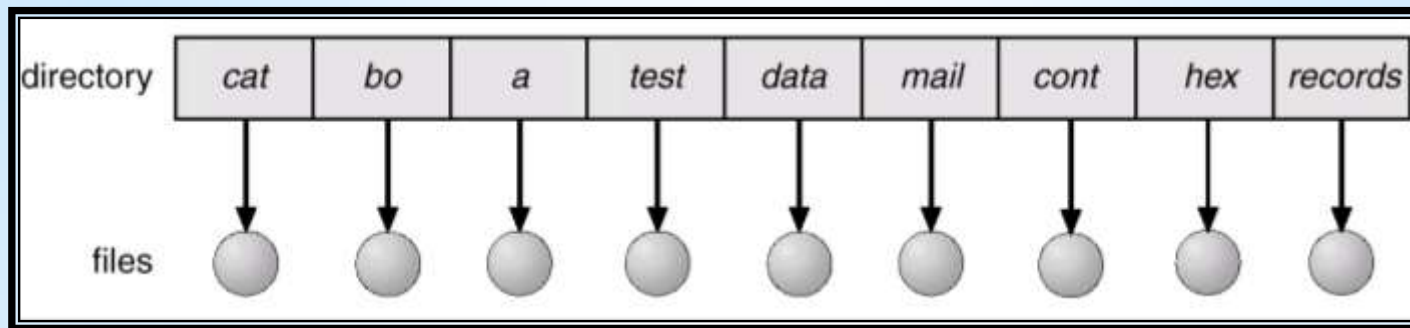* Protection information (discuss later)

Operating system

Operations Performed on Directory

*Search for a file

*Create a file

*Delete a file

*List a directory

*Rename a file

*Traverse the file system

Operating system

Single-Level Directory

A single directory for all users.

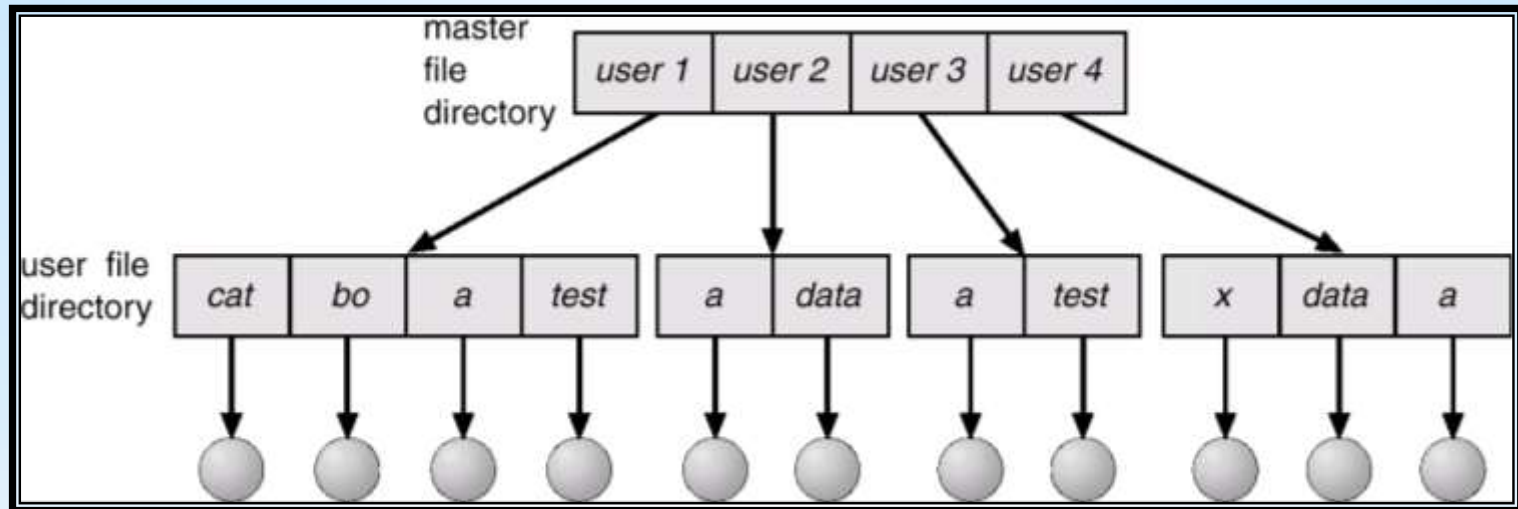| directory	cat	bo	a	test	data	mail	cont	hex	records

files: ● ● ● ● ● ● ● ● ●

Naming problem

Grouping problem

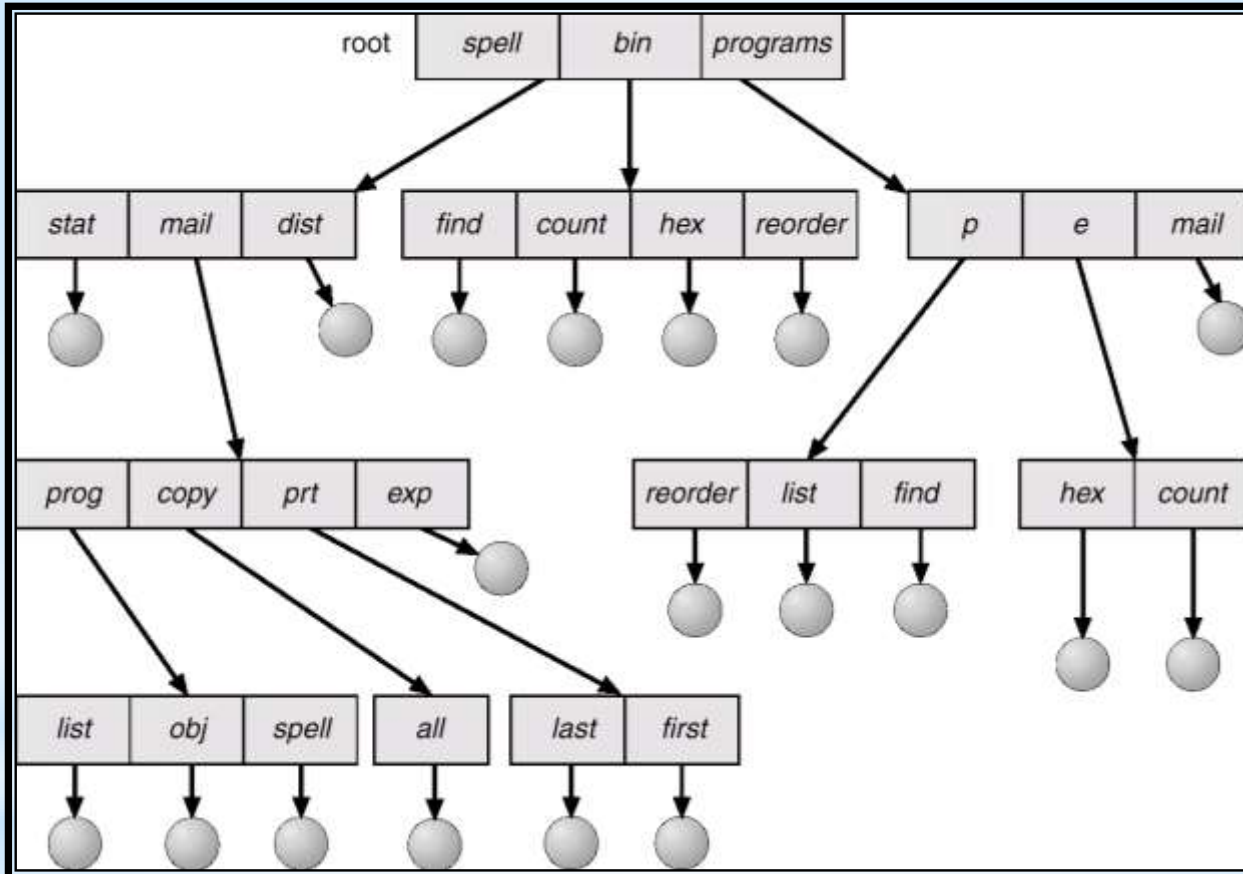# Two-Level Directory

*Separate directory for each user.

•Path name
•Can have the same file name for different user
•Efficient searching
•No grouping capability

Operating system

Tree-Structured Directories

Tree-Structured Directories (Cont.)

*Efficient searching

*Grouping Capability

*Current directory (working directory)
   * **cd** /spell/mail/prog
   * **type** list

Tree-Structured Directories (Cont.)

* **Absolute** or **relative** path name
* Creating a new file is done in current directory.
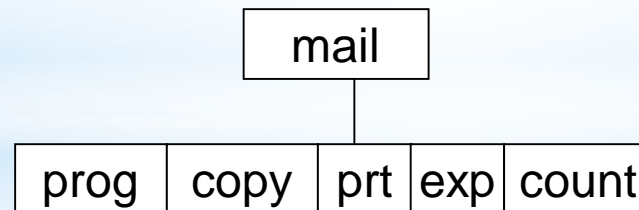* Delete a file

    rm <file-name>

* Creating a new subdirectory is done in current directory.

    mkdir <dir-name>

  Example: if in current directory   **/mail**

    mkdir count

```
                    | mail |
                       |
  | prog | copy | prt | exp | count |
```

Deleting "mail" $\Rightarrow$ deleting the entire subtree rooted by "mail".

Acyclic-Graph Directories

*Have shared subdirectories and files.

Operating system

Acyclic-Graph Directories (Cont.)

*Two different names (aliasing)
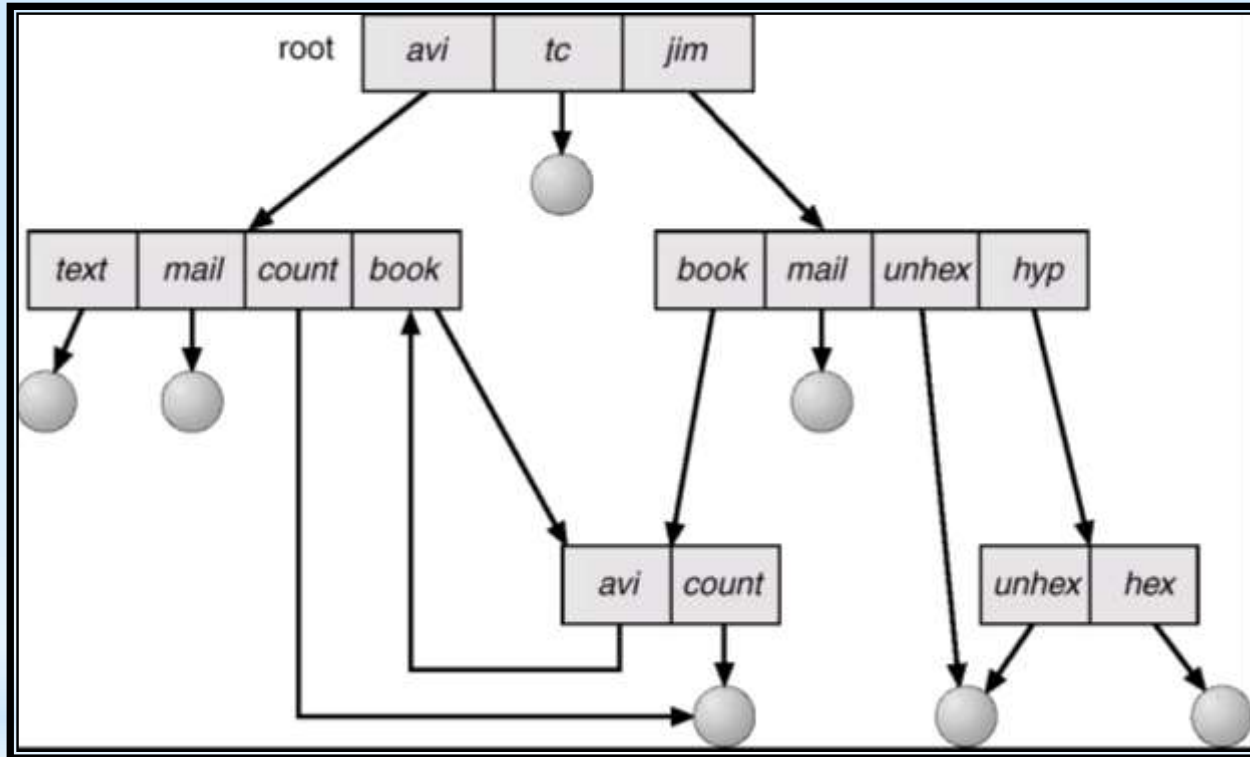
*If *dict* deletes *list* $\Rightarrow$ dangling pointer.

Solutions:

*Backpointers, so we can delete all pointers. Variable size records a problem.

*Backpointers using a daisy chain organization.

*Entry-hold-count solution.

General Graph Directory

General Graph Directory (Cont.)

How do we guarantee no cycles?

* Allow only links to file not subdirectories.

* Garbage collection.

* Every time a new link is added use a cycle detection algorithm to determine whether it is OK.

Operating system

THANK YOU