

A Short History of Directories

Approach 1 : Single directory for entire system

- Put directory at known location on disk
- Directory contains `hname`, `inumber` pairs
- If one user uses a name, no one else can
- Many ancient personal computers work this way

Approach 2 : Single directory for each user

- Still clumsy, and 1s on 10,000 files is a real pain

Approach 3 : Hierarchical name spaces

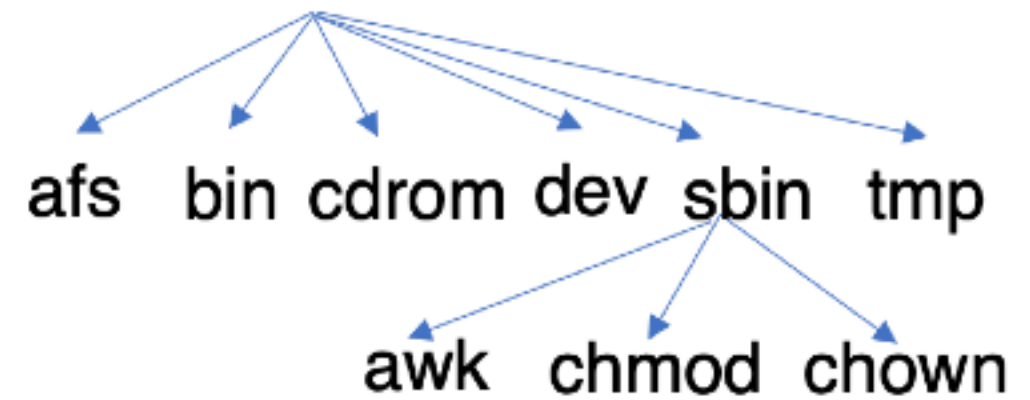
- Allow directory to map names to files or other directories
- File system forms a tree (or graph, if links allowed)
- Large name spaces tend to be hierarchical
(ip addresses, domain names, scoping in programming languages, etc.)

Hierarchical Directory

- ➔ Used since CTSS (1960s)
Unix picked up and used really nicely

Directories stored on disk just like regular files

- Special inode type byte set to directory
 - User's can read just like any other file
 - Only special syscalls can write
 - Inodes at fixed disk location
 - File pointed to by the index may be another directory
 - Makes FS into hierarchical tree
- ✓ Simple, plus speeding up file ops speeds up dir ops!



<name,inode#>

<afs,1021>

<tmp,1020>

<bin,1022>

<cdrom,4123>

<dev,1001>

<sbin,1011>

...