

File Basics

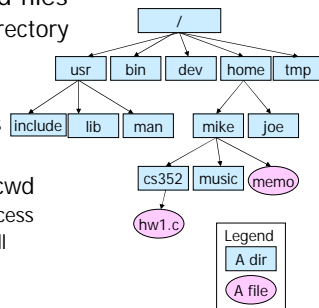
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Outline

- Unix File Organization
- Basic Commands
- Permission
- Wildcard – Filename Expansion

Unix File Organization

- A tree of folders and files
 - Directory and subdirectory
 - Parent and children
 - Root (only one)
 - Standard directories
 - Home directory
 - Working directory: cwd
 - Initial cwd for a process
 - Initial cwd for a shell
 - `pwd` command



File Types

- Normal file: executables, text files, C source files, spreadsheets, etc.
- Directory: actually is a file containing a list of (file name, file location) pairs
 - `.`
 - `..`
- Device file: `/dev/tty`
- Link:
 - Hard Link
 - Symbolic link (soft link)

Pathname

- A pathname identifies a particular file or directory uniquely
 - Absolute pathname
 - Relative pathname
- Current Working directory
 - `pwd` command

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ls – List Files

- ls
 - -a
 - -l
 - -F
 - / - Directory
 - * - Executable
 - @ - Symbolic link
 - etc.

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Directory Related Commands

- cd
- pwd
- mkdir
 - Must be empty
- rmdir
 - rm -rf dir_name

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View Text Files

- cat
 - cat mytext1 mytext2 mytext3 ...
 - -n, -b
- more
 - ENTER, SPACE
 - q
- less: a more powerful “more”
 - ENTER, y
 - d, u
 - SPACE, b
 - q

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View Text Files (cont.)

- head
 - -number
 - Multiple files are separated with “==>filenames<==”
- tail
 - +: start relative to the beginning
 - -: start relative to the end
 - -f: follow

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Edit Text Files

- emacs
 - Programming helper mode: C, HTML, TeX, Hex
 - Working environment: compile, email, Unix shell, time management, etc.
- xemacs: version of emacs on X-win
- vi
 - Two modes: edit & command
- gedit: a “textpad” style editor from GNOME

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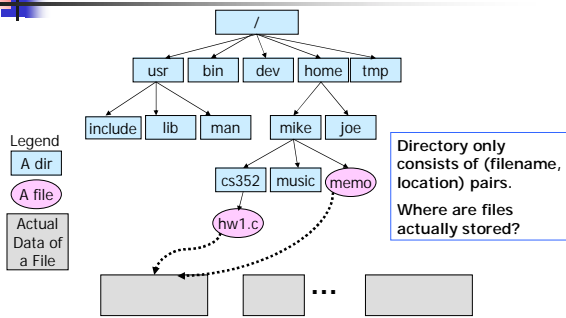
Copy, Move, Rename and Delete

- cp source_file target_file
 - -r
 - -f
- mv source_file target_file
 - Move directory & files
 - Rename directory & files
- rm file_list
 - -r, -f same as in cp

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Before Talking About Links



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Link

- Hard link
 - `ln oldfile newlink`
 - `ln file(s) directory`
 - Must be within the same file system
 - Can't create links for a directory
- Symbolic link
 - `ln -s source mylink`
 - Can be across file systems (e.g. NFS)
 - Can create links for a directory
 - Like the shortcut in Microsoft Windows

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Find Files

- `find path [expression]`
 - Recursively descends the directory hierarchy seeking files that match the expression(s)
 - `-name pattern`
 - `-size [+/-]n[c]` (512 bytes/block)
 - `-atime [+/-]n` and `-ctime [+/-]n`
 - `-prune`
 - `-exec`
 - `!, -o, -a, ()`

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File Permission

r	w	x	r	w	x	r	w	x
Owner			Group			Others		

- Owner, Group & Others
- "rwx" for files
- "rwx" for directories
- To access a file, you must have permission to access all the directories in the pathname.
- Set your web directory to be "rwx-----x" instead of "rwx---r-x". Why?

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File Permission (cont.)

- Change permission: `chmod`
 - Absolutely
 - Incrementally
 - `-R`
- Change ownership:
 - `chown`
 - `chgrp`
 - `-R`

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Wildcard – Filename Expansion

- Specify a group of files at one time by a pattern as a pathname
- The shell replaces the pattern with all matching pathnames before executing the command.
- Example:
 - `ls sub*`
 - `ls sub?.c`

Wildcards & Abbreviations

- `?`: any single character
- `[list]`: any character in the list
- `[lower-upper]`: any character in the range between lower and upper (inclusive)
- `*`: any pattern (including null)

- `~`: home directory
- `{}`: uncommon parts

Some Issues with Wildcard

- Hidden files and directories
 - `.login`, `.logout`
 - `ls .l*`
- Report error when no matching
- When requiring a single name, can't use wildcard
 - `cd ja*`
- Ambiguity
 - `cp invoices bus*`
 - Use "echo" to make it clear

Acknowledgement

- John H. Hartman, *Classnotes for Csc352-Spring03*, CS Dept., University of Arizona, 2003
- Gail Anderson, Paul Anderson, *The Unix C Shell Field Guide*, Prentice Hall, 1986