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Unix File System Command 2

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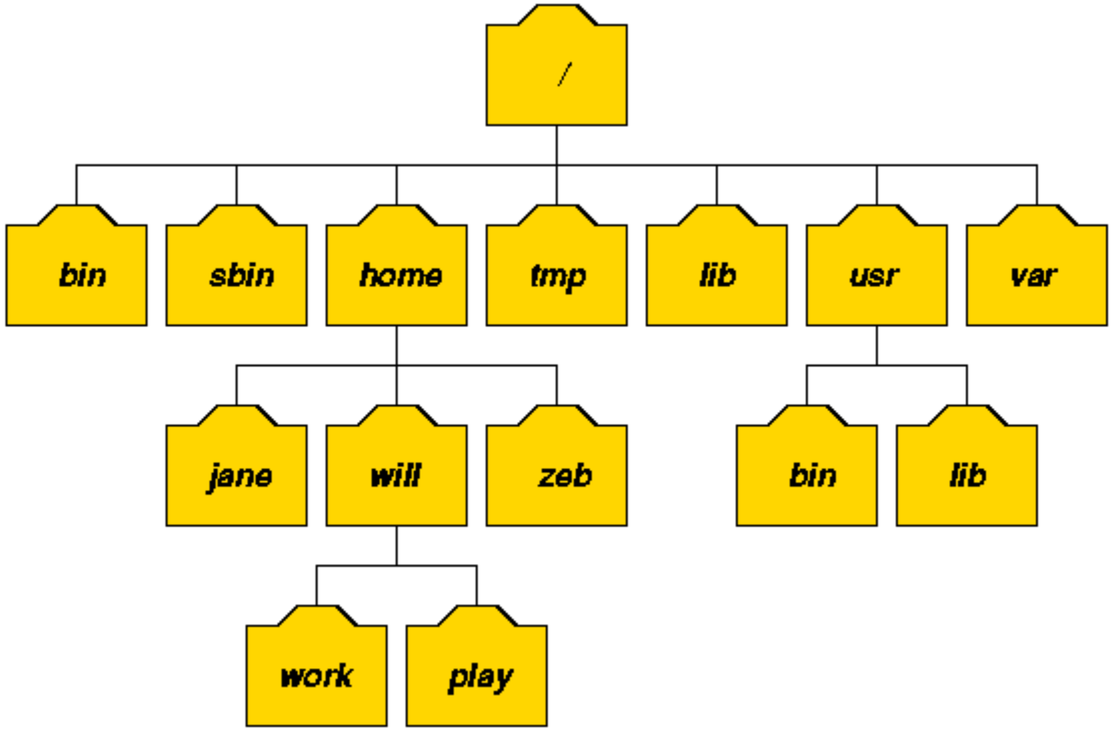
Recall Last Class

- Why learn Unix command?
- What is Shell?
- Root directory
- Simple ls, cd and pwd command

The Unix File System



Unix File System Tree
Picture from http://www.doc.ic.ac.uk/~wjk/UnixIntro/Lecture2.html

Today Class

- man and info commands
- user and group
- permissions on files or directories
- more information about cd and ls

Show help information

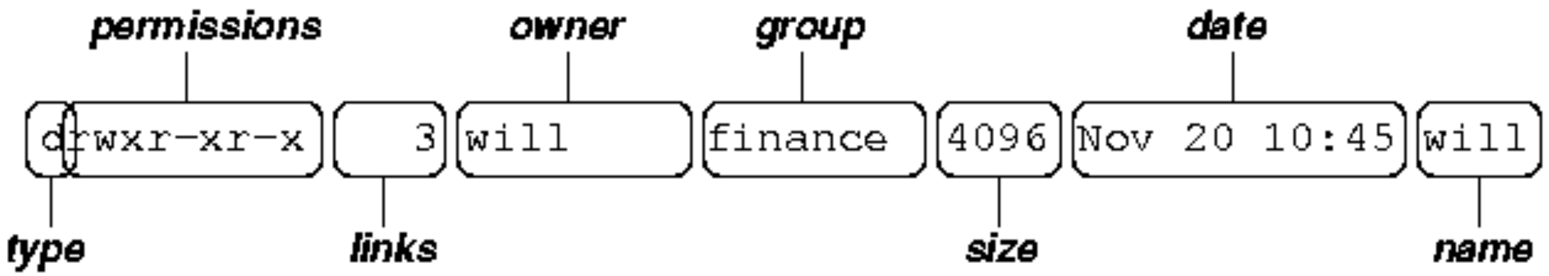
- **man commandName**
  - Show manual for computer programs (including library and system calls) and sometimes config files.
- **info commandName**
  - The info utility displays information for GNU utilities.
- **help commandName**
  - help is bash command, providing help for bash command only.

More about ls

- **ls [options] [file]**
- List directory contents (including subdirectories)
- The *-l* option lists detailed file/directory information.
- The *-a* option lists all files.

Command ls-al

- If you run **ls -al**



- type is a single character which is either 'd' (directory), '-' (ordinary file), 'l' (symbolic link), 'b' (block-oriented device) or 'c' (character-oriented device).

Permission of File/Folder

- Permissions is a set of characters describing access rights.
- There are 9 permission characters, describing 3 access types given to 3 user categories.
  - The three access types are read ('r'), write ('w') and execute ('x’).

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Permission of File/Folder

- The three users categories are
  - The **user** who owns the file
  - The users in the **group** that the file belongs to
    - E.g. hw.txt belongs to group of student.
    - E.g roster.csv belongs to group of faculty.
  - **other** users (the general public)
- An 'r', 'w' or 'x' character means the corresponding permission is present; a '-' means it is absent.

Permission of File/Folder

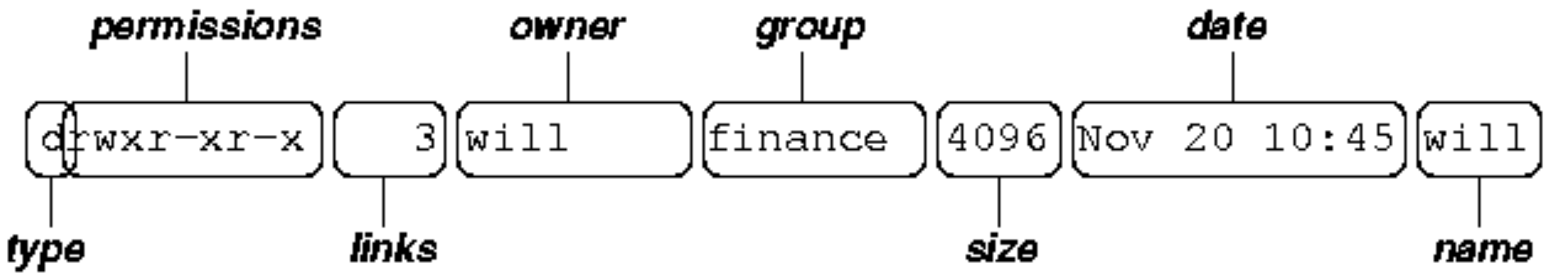
- $\underbrace{\texttt{rwx}}_{\text{User privilege}}\underbrace{\texttt{r-x}}_{\text{Group user privilege}}\underbrace{\texttt{r-x}}_{\text{Other user privilege}}$

In this example:

- we see 9 characters to represent permission.
- The first three characters specify the owner's privilege. The owner has full permission on this file.
- The three characters in the middle show the Group's privilege for this file. Group users can read and execute, but cannot write.
- The last three characters show the privilege of all other people. They can read and execute.

Command ls-al

- If you run **ls -al**



- type is a single character which is either 'd' (directory), '-' (ordinary file), 'l' (symbolic link), 'b' (block-oriented device) or 'c' (character-oriented device).

Command ls –al

- links refers to the number of filesystem links pointing to the file/directory
- We have more information on soft links later.
- Soft links (or symbolic links) are like shortcut in windows.

Command ls –al

- owner is usually the user who created the file or directory.
- group denotes a collection of users who are allowed to access the file according to the group access rights.
  - Example: on a Unix machine, we have student group and teacher group.
  - Student and teacher have different privileges.

Command ls –al

- size is the length of a regular file, or the number of bytes used by the operating system to store the list of files in a directory.
- date is the date when the file or directory was last modified (written to).
- name is the name of the file or directory.

Command cd

- **cd [directory_name]**
  - changes directory to [directory_name]
- If not given a destination defaults to the user's home directory.
  - **cd** will bring to my home directory.
- takes both absolute path (cd /home/ytian/cscd240) and relative path (cd cscd240 when you are currently in /home/ytian)

Command cd

- Absolute path
  - location of a file or folder starting at /
  - E.g. /home/ytian/cscd240/roster.pdf
- Relative Path
  - location of a file or folder beginning at the current directory.
  - When I am in my home directory **/home/ytian**, the relative path for roster.pdf is

    cscd240/roster.pdf

Command cd

- **cd ..**
  - Change into the parent directory of the current directory.
  - '..' means parent directory of current directory
  - '.' means current directory.

Command cd

- Assume we are currently in /home/ytian/cscd240 (We can verify by using **pwd)**
  - If we run **cd ..**
  - Then run **pwd,**
  - what we will see?

/home/ytian

  - Following the previous, then we run **cd ../smith**
  - Then run **pwd**
  - What we see now?

/home/smith

Command cd

- **cd –**
  - bring you back to the directory in which you ran the latest cd command.

Command mkdir

- **mkdir directoryName**
  - Creates a subdirectory called directoryName in the current working directory.
  - If you are the owner of the current directory, if the permission for the current folder is

    'r-xr-xr--',

    can we create a folder in current directory?
    - No
    - You can only create subdirectories in a directory if you have write permission on that directory.

Command rmdir

- **rmdir directoryName**
  - Removes the subdirectory directoryName from the current working directory.
  - You can only remove subdirectories if they are completely empty (i.e. of all entries besides the '.' and '..' directories).

Take Home Summary

- ls –la list all directory contents in details
- cd .. change to parent directory
- pwd print working directory
- rmdir remove directory only of not empty
- Permission
  - rwxrw-rw-

Next Class

- More File System commands
  - mv, rm etc.