Shell Programming

A Necessity for all Programmers

File Types and Named Pipes

Nagesh Karmali | Firuza Karmali
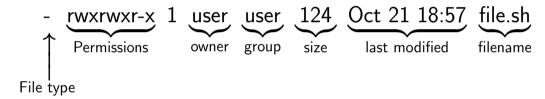
IITBX
Infinite Learning

Department of Computer Science and Engineering
IIT Bombay

- Identify file types
- Create and destroy links
- Explore named pipes

- long list format
- displays information

$$\underbrace{\text{-}}_{} \quad \underbrace{\text{rwxrwxr-x}}_{\text{Permissions}} \quad 1 \quad \underbrace{\text{user}}_{\text{owner}} \quad \underbrace{\text{user}}_{\text{group}} \quad \underbrace{\text{124}}_{\text{size}} \quad \underbrace{\text{Oct 21 18:57}}_{\text{last modified}} \quad \underbrace{\text{file.sh}}_{\text{filename}}$$

File type

File Types

- Regular file (-)
- Symbolic link (l)
- Character special (c)
- Block Special (b)
- Named pipe (p)
- Directory (d)

Regular files

- Store any kind of data
- program files
- executables
- More info: **file** <**filename**>

Links

- Points to another file
- Maintain multiple copies (without using extra storage)
- Altering content in link file, alters original file too, vice versa

Hard links: **ln src target**

- points to a file; not a directory
- indistinguishable (no difference between hard link or original file)
- hard link can be re-located
- Original file is not affected if hard link is deleted
- If original file is deleted, the content remains until the link is deleted

Symbolic/Soft links: **ln -s src target**

- Stores pathname to another file
- Pathname: absolute or relative
- symlinks (relative path) if relocated may not work
- Original file is not affected if sym link is deleted
- If original file is deleted, sym link will not work

Device files

- Hard drives, keyboard, printers: accessed using device files
- **/dev** directory
- Character special
  - Communicate with device (One character at a time)
  - raw device
  - Example
    ls -l /dev/usb/hiddev0
    crw——- 1 root root 180, 0 Oct 23 11:08 /dev/usb/hiddev0
- Block special
  - communicate with device (large blocks of data)
  - Example
    ls -l /dev/sda
    brw-rw—- 1 root disk 8, 0 Oct 23 11:08 /dev/sda

Named pipe

- Pipe operator: Redirect output of one command to other
- Temporary anonymous pipes
- Named pipes: files that are anonymous pipes
- Created: **mkfifo file**
- Removed: **rm**

- Understand different file types
- Create hard and symbolic/soft links
- Create named pipes

Thank you