Linux Advanced

CS101

Input and Output

- `|` - Pass output to another program
  - `cat foo.txt | grep word` - Display the contents of `foo.txt`, and then send it to the `grep` program to search for the string “word”
- `>(>) and <` - Redirect standard in and out
  - `echo ‘hello’ > hello.txt` - Echo the string ‘hello’ to standard out, and then redirect standard out to the file `hello.txt`
  - `echo ‘hello’ 2>&1` - Redirect standard error to standard out
  - `>` overwrites and `>>` appends
- `Tee` - Redirect output to multiple places
  - `ping google.com | tee output.txt` - Ping google.com and then send the output to both standard out and `output.txt`

Files

- `chmod` - Change the file permissions for a file.
  - `chmod +x <file>` - Make a file executable for the user.
  - `chmod 755 <file>` - Change the file permissions for a file.
    - Permissions are split into values: `read` is 4, `write` is 2, and `execute` is 1.
    - Add up the permissions you want for each category: `user group everyone`.
    - Here, the permissions for `user` are read (4), write (2), and execute (1) is 7 (4 + 2 + 1), and for `group` and `everyone` are read (4) and execute (1) are 5 (4 + 1).
- `file` - Print information out about a file.
  - `file foo.txt` - Will print out that it is an ASCII file

Archives

- `tar` - Compress and uncompress tarballs (archive files).
  - `tar -xzvf foo.tar.gz` - Decompress the tarball `foo`.
    - `x` - extract
    - `z` - use gzip (use this option on .tar.gz files)
    - `v` - verbose
    - `f` - use archive file in the next argument (`foo` in this case)
  - `tar -czvf foo.tar.gz bar` - Compress file(s) bar into a tarball named `foo`
    - `c` - compress
- `zip/unzip` - Compress and uncompress ZIP archives.
  - `unzip foo.zip` - Compress and uncompress ZIP archives.
  - `zip foo.zip bar` - Compress file(s) `bar` into a ZIP archive named `foo`.

Printing

- `grep` - Search for a string in given input.
  - `grep foo bar.txt` - Look for the string `foo` in the file `bar.txt`.
- `head/tail` - Print the first or last lines of a file.
  - `head/tail foo.txt` - Print first/last 10 lines of `foo.txt`
  - `head/tail -20 foo.txt` - Print first/last 20 lines of `foo.txt`
  - `head/tail -c 420 foo.txt` - Print first/last 420 characters of `foo.txt`

Processes

- `ps` - List running processes
  - `ps -au` - Look for the string `foo` in the file `bar.txt`.
    - `-a` - Select all processes except both session leaders and processes not associated with a terminal.
    - `-u` - Select by effective user ID (EUID) or name.
- `kill` - Kill a process
  - `kill <PID>` - Kill the process with process ID `<PID>`
  - `Killall fo` - Kill process by name `foo`
- `top/htop` - Provide information about the most CPU-intensive processes currently running (kinda like Task Manager)
  - `htop` is just a prettier version with more features

System

- `ifconfig` - Print out networking information
  - Your public IP address is in either `eth0`/`eth1`/etc. if you are on ethernet or `wlan0`/`wlan1`/etc.
- `uname` - Print out operating system information
  - `uname -a` - Print out the version of Linux you are using (including distribution, kernel, etc.)

Terminal

- `alias` - Make 'shortcuts' for commands
  - `alias dl="cd ~/Downloads"` - Whenever you type in `dl`, `cd ~/Downloads` will be run
- `ctrl+x+e` - Edit that last command in a text editor
- `sudo !!` - Rerun the last command as root

Web

- `curl` - tool for getting or sending data including files using URL syntax.
  - `curl foo.com` - Get the content from `foo.com` (and print to terminal)
  - `curl -I foo.com` - Get the response headers from `foo.com`. Useful for getting the response codes (e.g. 200, 404, 500, etc.)
- `wget` - tool to get content from websites
  - `wget foo.com` - Download all the files from foo.com
  - `wget -r -np foo.com` - Recursively download all files from `foo.com`
    - `-r` - Recursive, download all files and directories below this file in the file structure
    - `-np` - No Parent, don't download files/directories above this file in the file structure

More Resources

- Explainshell.com
- Man(ual)Pages
  - man <command>

Questions?

Thanks for coming!