CSCI 3308 – Software Development Methods and Tools

University of Colorado
Boulder

Topics

- What is Linux?
- Basic Linux Commands
- VIM Editor

What is Linux?

- Unix was originally developed at Bell Labs by Ken Thompson, Dennis Ritchie and others for use inside the Bell system
- It is trademarked as **UNIX**
- UNIX variants were then developed at UC Berkeley, Microsoft, IBM, Sun Microsystems etc.
- Linux is an open source variant of UNIX

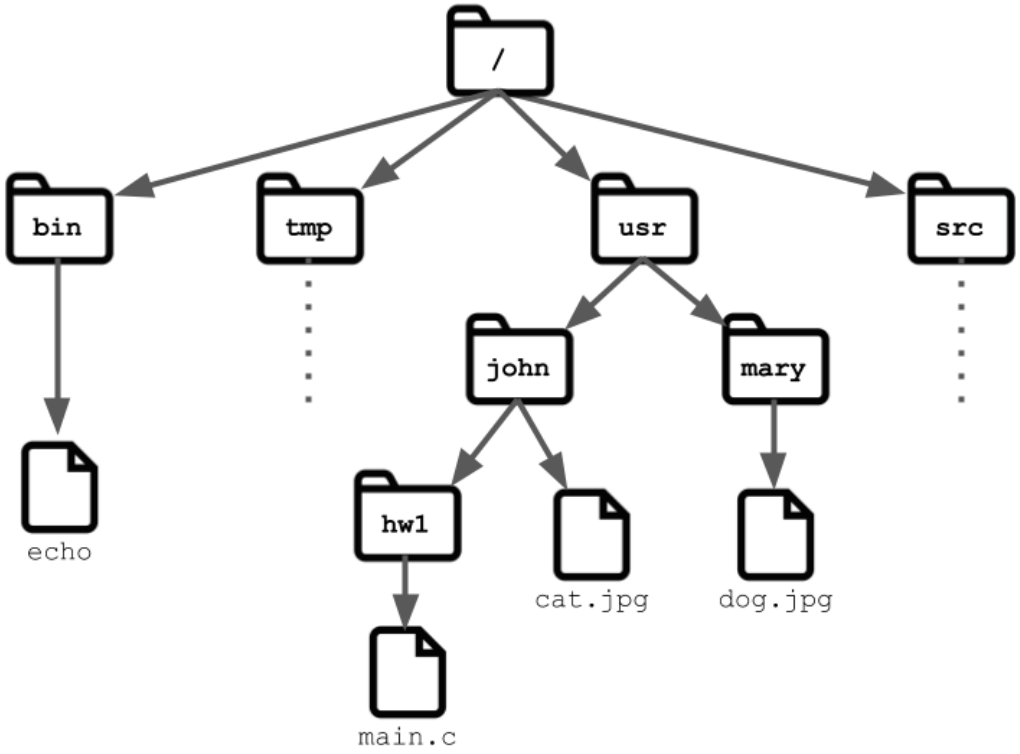
Linux Kernel

- **Linux kernel** is a core component of the Linux Operating System. It is written almost entirely in the C programming language. Software can be used to modify the appearance of Linux, but the kernel is common to all Linux. It is important to understand the Linux kernel version numbers to decide which version is appropriate. A good understanding of system hardware is important in deciding which kernel version to use.

Linux Terminal

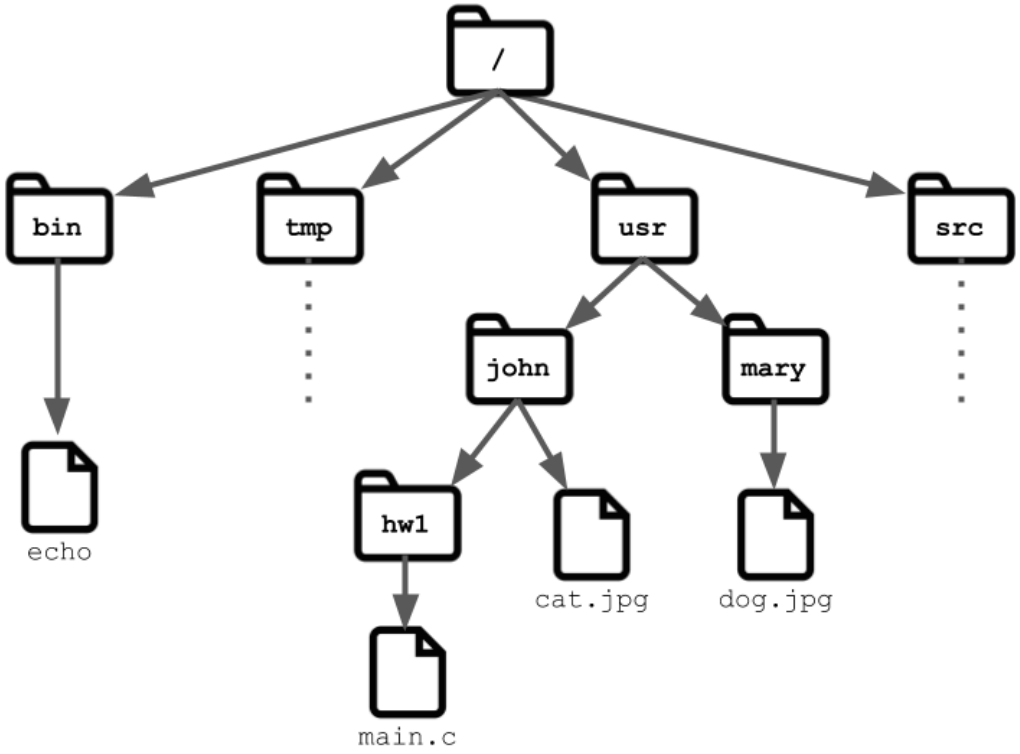
- When you select the terminal icon on your desktop, you can create an interface with a shell
- Everything you type on the terminal window is sent back to the shell and the response from the OS is printed on your terminal window
- Types of terminals include gnome-terminal, konsole, xterm, rxvt, kvt, nxterm, and eterm.

Linux File Structure



- **Current working directory**
  - **pwd** – print working directory
  - **cd** – change directory
  - Relative path vs full path
- **File System Commands**
  - **ls** – list directory contents
  - **cp** – copy files
  - **rm** – remove files
  - **mv** – move files
  - **mkdir** – make directory
  - **rmdir** – remove directory

Linux File Structure



- Current directory (.)
- Parent directory (..)
- Relative path

Linux Commands

- **cat** – copy the contents to the screen
- **more (less)** – display file contents in a user-friendly manner
- **head** - copy the first lines of a file to the screen
- **tail** – copy the last lines of a file to the screen
- **wc** – count the number of lines, words, characters in a file
- **grep** – globally search a regular expression and print
- **find** - Find a file in a directory tree
  - find . -name *filename* -print
- **locate** - searches for files in the Linux directory tree

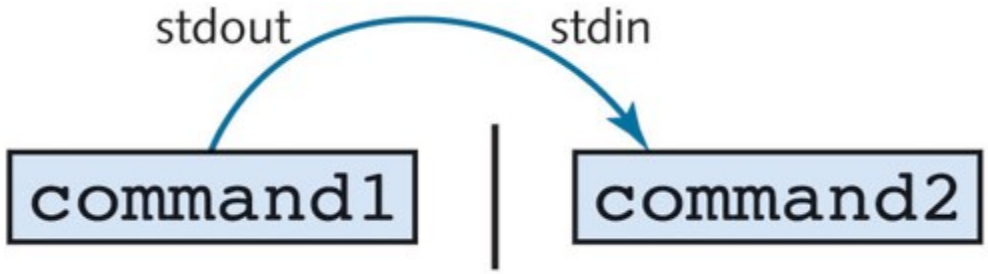
Linux Commands

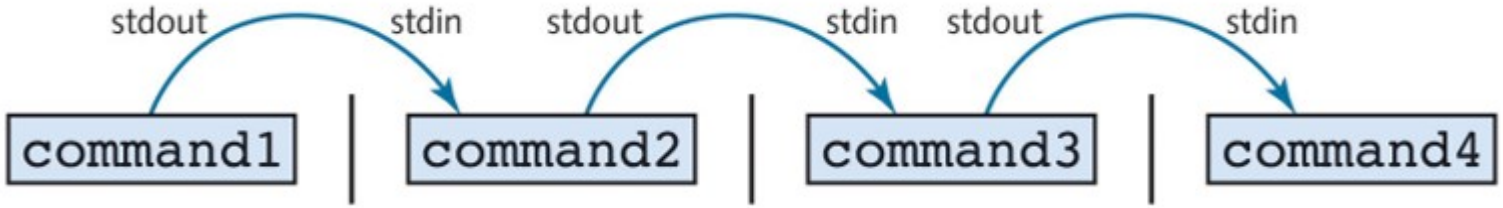
- **who** – list of current users
- **whoami** – what is my username
- **top** – list the processes using the most resources
- **ps** – process status
- **uptime** – how long has the system been running
- **date** - current date and time
- **diff** - compares the difference between 2 files
- **touch** – create new files

Linux Commands

- **wc** – count the number of lines, words, characters in a file
- **grep –** output lines matching a pattern
- **sort –** sort lines of text
- **uniq –** filter out repeated lines in a file
- **cut –** cut out selected portions of each line of a file
- **tee –** sends the data to both a file and stdout.
  - receives information from stdin and sends that information to a file, as well as to stdout.

Tee Command


stdout
stdin
command1
command2


stdout
stdin
stdout
stdin
stdout
stdin
command1
command2
command3
command4

Tee Command

```
root@debian:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0c:29:e1:29:7f
          inet addr:192.168.1.206  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fee1:297f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3254 errors:0 dropped:0 overruns:0 frame:0
          TX packets:146 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:659203 (643.7 KiB)  TX bytes:17718 (17.3 KiB)

root@debian:/# ifconfig eth0 | grep "inet addr"
          inet addr:192.168.1.206  Bcast:192.168.1.255  Mask:255.255.255.0
root@debian:/#
```

Tee Command

```
root@debian:/# ifconfig eth0 | grep "inet addr" | tr -s " " ":"
:inet:addr:192.168.1.206:Bcast:192.168.1.255:Mask:255.255.255.0
root@debian:/# ifconfig eth0 | grep "inet addr" | tr -s " " ":" | cut -d ":" -f4
192.168.1.206
root@debian:/#
```

VIM Editor

- **vim filename to edit a file, Vim starts out in command mode.**
- **To enter the insert mode, type i (for "insert")**
  - To get out of insert mode, hit the Escape key.
  - Once you press Escape, you're in command mode again.
  - press ": " and Vim will switch to *last-line* mode. Enter a command like
    - ***:w to write the file, or***
    - ***:q to exit the editor, or***
    - ***:q! to quit without saving etc.***

Questions?