Introduction To Unix

CS 471/Math 471

Brian T. Smith, UNM

Andrew C. Pineda, UNM

What Is Unix?

- Operating system developed at AT&T in the 1970s
- Portable (moveable) to any platform (not proprietary to a particular hardware vendor)
- Now available as a public domain OS
  - known as Linux
- Reference: Unix is a Four Letter Word...
  - C. C. Taylor, Aug. 1993

What Is An Operating System?

- A program that:
  - interprets commands you give it
  - provides a file system for your files
  - provides interfaces to peripherals such as printers, disks, tapes, CDs, screens, networks
- Examples of other OSs
  - VMS, DOS, Windows, NT, ...

Basics Of Unix

- Commands are case sensitive
  - ls and LS are NOT the same
- The shell is the command line interpreter and there are different shells
  - csh, sh, tcsh, bash, ksh ...
  - they make each Unix look different
  - UNM and AHPCC uses csh by default

Basics Of Unix Continued

- Command syntax
  - **command [flags] arg1 arg2 ...**
- Examples:
  - **ls -l *.ps**
  - **ls smith**
  - **ls -a**
    - lists all files that begin with the dot character

Files And Directories

- Files contain information
  - ASCII characters
  - binary code
  - executable files (binary code)
  - a directory (encoded information about what files are in the directory)
- Directory is a collection of files and other directories

Pathnames

- The entire Unix file system is a series of files, some of which are yours
- You get to your files (your desk in the building and a particular drawer in your desk) by specifying a path
- Path names are:
  - /usr/local/bin
  - /home/bsmith or the short form ~bsmith or ~

Pathnames Cont'd

- A pathname is a series of names separated by slashes
- The root file system is /
- Names are a sequences of letters, digits, underscores, dots, ... (other characters but be very careful with some of these)
- Absolute pathnames begin with /

Special Pathnames

- . (a single dot) is the current directory
- .. (double dot) is the directory above the current directory
- ~ is your home directory (csh and tcsh only)
- ~user_name is user name's home directory(csh and tcsh)
- $HOME is the home directory

Relative pathnames

- Let's say you are currently in */home/bsmith* and want to edit a file */home/bsmith/dir/fname.ext* with **vi**. You can use any of:

  vi /home/bsmith/dir/fname.ext
  vi dir/fname.ext
  vi ./dir/fname.ext
  vi ../bsmith/dir/fname.ext

Basic commands

- Copying files
  - **cp [flags] file(s) destination**
  - destination can be a file or directory
  - Analogue: COPY in MSDOS and VMS
- Renaming or moving files
  - **mv [flags] file(s) destination**
  - Analogues: RENAME and MOVE in MSDOS

Basic commands cont.

- Deleting files [and directories]
  - **rm [flags] file(s)**
  - **rm -r directory**
  - Analogues: DEL, DELTREE in DOS
- Listing files and directories
  - **more file**
  - **ls [flags] [file(s) or directories]**
  - Analogues: MORE and DIR in DOS

Basic Commands - cont.

- Changing directories
  - **cd [directory]**
- Creating/deleting directories
  - **mkdir [directory]**
  - **rmdir [directory]**
- Finding out where you are
  - **pwd**

Basic commands - cont.

- Job/process control (* - csh and tcsh)
  - **jobs** (list suspended and background tasks *)
  - **^Z** *or* **^C** (suspend* or terminate current task)
  - **bg [%job]** (run suspended task in backgrnd *)
  - **fg [%job]** (bring task to foreground *)
  - **kill -9 %job [or id]** (terminate task)
  - **command &** (run *command* in background *)
  - **ps** [flags] (show status of processes)

Basic Commands - cont.

- Connecting to remote machines
  - **rlogin host [-l username]**
  - **telnet host**
- Transferring files
  - **ftp host** (over a network)
- Collecting files into a single file
  - **tar cvf archive.tar files_and/or_directories**
  - **tar xvf archive.tar**

Basic File I/O

- Most commands read from standard input and write to standard output, and can be chained together to perform complicated tasks
  - **command < input > output**
  - **command < input >& output**
  - **cmd1 < input | cmd2 | cmd 3 > output**