Unix Tools / Command Line

An Intro

Basic Commands / Utilities

I expect you already know most of these:

- ls – list directories
  - common options: -l, -F, -a
- mkdir, rmdir – make or remove a directory
- mv – move/rename a file
- rm – remove a file
  - Common option: -f
- cd, pwd – change / print the current working directory
- cat – concatenate files
- more (or less) – display a large file, one screen at a time.
- man – look up manual pages
  - common options: -k -a
- gcc – compile a C program.
  - Common options: -o -O -g -std= -Wall

globbing

- An asterisk matches any string (even zero length):
  - ls *.c
  -
- A question mark matches any single character.
  - ls ?.c
- Square brackets can specify a “character class” or a range:
  - ls [abcd].c
  - ls [a-d].c
- Caret at the beginning negates the selection in the class:
  - ls [^a-zA-Z]*
  - Matches any file name beginning with something other than a letter
- Use of quotes prevents globbing
  - ls “?.c”
  - Only matches the file [oddly] named ?.c

I/O redirection

- To standard output
  - ls > outputfile # **replaces** outputfile
  - ls >> outputfile # **appends** to outputfile
- Standard error
  - myProgram 2> errorFile
- Standard output AND standard error to the same file? Might try:
  - myProgram 2> aFile > aFile
  - myProgram > aFile 2> aFile
- Actually, those don't work. Correct way is either:
  - myProgram > aFile 2>&1
  - myProgram &> aFile
- Standard input
  - mail jsterling@poly.edu < Jabberwocky.txt
  - mail jsterling@poly.edu << blah
    this is the
    stuff before blah
    blah

Piping

- Piping allows the output of one process to be fed into another.
- In the shell, the vertical bar ‘|’ is used.
- Examples
  - If a command has a lot of output, feed it to more (or less).
    - `dmesg | less`
  - Getting a count of lines:
    - `ps ax | wc –l`
  - Spell checker:
    - ```
      tr -d '.,;:"\!\[]()?' | tr '    ' ' ' \
        | tr ' ' '\n' | tr '[A-Z]' '[a-z]' \
        | sort | uniq | comm -23 - /usr/dict/words
      ```
      ```

find

- Figure out where you put your files
  - find start options…
- find . -name pattern –print
- Lists all files that match the pattern in the current directory *and any subdirectories.*
- The pattern should be in quotes to prevent the shell from using globbing in the current directory.
- -print is a default action so it can be omitted if there is no other action.
- find . -name “*.exe” –print –delete
- Remember the quotes if you are using globbing.
- Lists and deletes all files ending in .exe in the current directory and subdirectores.
- Avoid using find on the root directory on a shared machine.

Archiving

- Most common command is tar
- Create a tar file
  - Command:
    - `tar -cvf the_tar_file files`
  - The dash is generally optional.
  - The option c means create
  - The option v means verbose
  - The option f says the next file is the tar file to create.
- Untar. Use option x
  - `tar –xvf the_tar_file`
- Check the contents of a tar file. Use option t
  - `tar –tvf the_tar_file`
- Also compress/uncompress with gzip. Use option z.
  - `tar -cvzf the_tar_file files`
  - `tar –xvzf the_tar_file`

Viewing a binary file

- hexdump
  - hexdump –C someFile
  - Outputs file in both hex and ascii text. There are lots of options but the –C option provides a commonly convenient view of the file.
- bless
  - A popular hex *editor* for Linux
- Emacs
  - To enter: M-x hexl-mode
  - To exit: C-c C-c

Where am I logged in? And to what?

- uname
  - “prints system information”
- With no parameters prints the “kernel’s name”
- To get everything us the –a option
  - uname –a
  - On pdc-amd01 prints:
    - Linux pdc-amd01 2.6.24-28-generic #1 SMP Wed Nov 24 09:00:20 UTC 2010 x86_64 GNU/Linux
  - On my cygwin prints
    - CYGWIN_NT-5.1 Gandalf 1.5.19(0.150/4/2) 2006-01-20 13:28 i686 Cygwin
- Can also use “hostname”, which just tells you the hostname.
  - Ok, it also lets you change it…

If you don’t know who you are…

- If you don’t know who you are
- … then you’ve got a problem
- But you can solve it with the command:
  - whoami
- You can also find out your uid, guid and groups with
  - id

Other Common Utilities

- chmod – change the permissions on a file
- cmp – compare sorted files (what's in one, the other, both)
- diff – line by line difference between two files
- df – disk space free
- du – disk space used
- gdb – debugger
- grep – find lines that match a “regular expression”
  - Common option: -r
- head, tail – print the first or last lines of a file
- make – run the commands in a “Makefile” (covered in C slides)
- pushd, popd, dirs – keep a stack of “current” directories
- sort – sort a file
- tr – translate characters
- uniq – remove duplicates
- umask – change / print the user file-creation mask