"Education has failed in a very serious way to convey the most important lesson science can teach: skepticism."

- David Suzuki

COSC 2306 - UNIX

Fall 2008

Aaron Langille

Textbook

- Linux for Programmers and Users
  - Graham Glass and King Ables
- Website:
  - www.cs.laurentian.ca/aaron/cosc2306
  - Webct.laurentian.ca
- Office: FA364

Grading Scheme

- Assignments:
  - 6 @ 5% each = 30%
- Mini Tests:
  - 5 @ 5% each = 25%
- Final Exam:
  - 1 @ 45% (must pass exam!)

Policies

- You should be aware of and familiar with the following:
- **LU Academic Dishonesty**
  - http://laurentian.ca/vpacademic/POLICIES/DISHONESTY.pdf
- Do not copy
  - From each other
  - From another un-cited source
  - From the slides
- Beware of Wikipedia
- **CS Regulations for Computer Facilities and Services**
  - http://www.laurentian.ca/Laurentian/Home/Departments/Math+and+Computer+Science/regulations.htm

General Topics

- See: www.cs.laurentian.ca/aaron/cosc2306
- See: Outline posted on WebCT
  - Make sure you can log into WebCT and are registered in COSC2306

Questions to answer:

- Linux is _____?
- UNIX is _____?
- Why learn Linux?
- Why use Linux (what is it good at)?

Operating System

- Linux is an operating system.
  - Provides easy, efficient, fair, orderly and secure access to hardware and software resources.
  - Serves as the interface between the user and the hardware.
    - CUI – Character User Interface
    - GUI – Graphical User Interface
  - Ambiguity of the term OS…

General Terms/Concepts

- File
- Program
- Process
- Ownership
- Hierarchical Directory Structure

- Sharing Resources
- Communication (pipes)

Current (common) Linux/UNIX Features

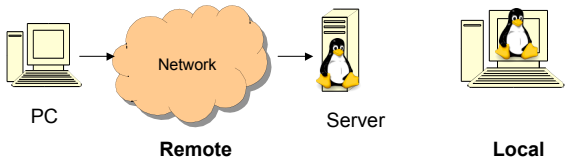
- Multi-user (massively)
- Supports the creation modification and destruction of programs, processes and files.
- Directory hierarchy that provides location of processes and files.
- Large number of standard utilities.
- Allows programmers to access operating system features through standardized system calls.
- Portable and available on many hardware platforms.
- Standard and open system (typically).

Linux and UNIX Philosophy

- Solve complex problems using simple (single purpose) utilities.

- How?
  - Pipes.
  - Ask for help.
  - Write a new simple (single purpose) utility. **Make it available to others.**
  - Last resort: Write a complex multi-function program.

Accessing a Linux System



- Account based – unique username/password
- When you log in a shell is created for you.
- Logging Out: Simply type exit or CTRL-D (^D) from the command line.

Running a Utility / Command

- To run a utility you simply type its name and hit Enter
  - Must be in your PATH and be executable

  Or
  - Use the full path if it is not in your PATH.
- General syntax:

```
$ command [[-]option(s)] [option argument(s)] [command argument(s)]
```

Syntax of a UNIX/Linux Command

- command : The name of the command or utility.
  - `ls, man, cat, mv`
- options: Change the behaviour of the command basic.
  - `ls -l vs. ls`
  - May or may not be preceded by "-".
- option arguments: Change the behaviour of an option.
  - `tail -c 5 filename vs. tail -c 15 filename`
- command arguments: what is affected by the command.
  - Usually files or the output of another piped command.

whoami and what am I doing here?

- How to get started on UNIX:
  - Basic commands
    - Figuring out who we are and where we are.
      - `whoami, uname, hostname, who, date`
    - Getting help with commands.
      - `man`
    - Navigating directories
      - `cd, pwd`
    - Creating and manipulating files and directories
      - `touch, cp, mv, rm, rmdir, mkdir`
    - Listing files and their properties.
      - `ls, file`
    - Displaying the contents of files
      - `cat, tail, head, more, wc`
  - **KNOW these commands and their common switches.**

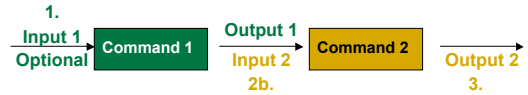
`man` - Using `man` to Get Help

- The man (manual) utility accesses the online help pages for a particular utility
  - Eg: `man ls`
    - `Chapters → man # command`
  - Try `man man` for more information

Special Characters

- Metacharacters : stty –a (to list)
  - ^ denotes the ctrl key
- In particular:
  - intr = ^C – terminating a command
  - susp = ^Z – suspend command execution
  - eof = ^D – end of input
  - erase = ^? – terminal character erase

Pipes




```
who | wc -l
```

Doing your assignments and practicing…

- Use shell.cs.laurentian.ca (via putty).
  - Or locally in the Linux Lab (FA358)
  - Log in using your Novell username and password.
- Live Boot CDs
- Your own Linux system.
- NOTE: Your assignments must work on "shell.cs.laurentian.ca" in order to be considered correct.

Things to do:

- Read Chapter 1.
- Login (either remotely or in the lab)
  - Verify username and password.