CSE 303
Lecture 1

introduction to Linux/Unix environment

read *Linux Pocket Guide* pp. 1-21

slides created by Marty Stepp

http://www.cs.washington.edu/303/

Lecture summary

- discuss course syllabus

- Unix and Linux operating system

- introduction to Bash shell

Operating systems

- **operating system**: Manages activities and resources of a computer.
  - software that acts as an interface between hardware and user
  - provides a layer of abstraction for application developers

- features provided by an operating system:
  - ability to execute programs   (and multi-tasking)
  - memory management   (and virtual memory)
  - file systems, disk and network access
  - an interface to communicate with hardware
  - a user interface   (often graphical)

- **kernel**: The lowest-level core of an operating system.
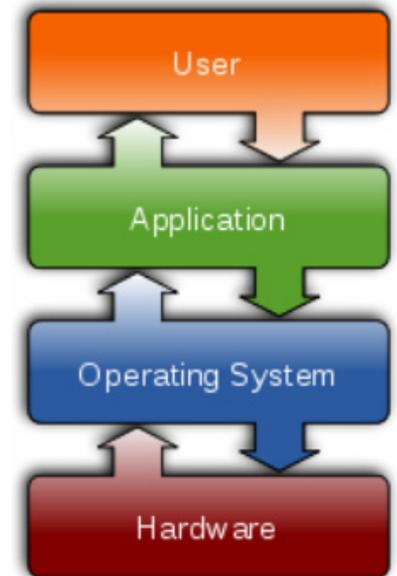
Unix

- brief history:
  - Multics (1964) for mainframes
  - Unix (1969)
  - K&R
  - Linus Torvalds and Linux (1992)

- key Unix ideas:
  - written in a high-level language (C)
  - virtual memory
  - hierarchical file system; "everything" is a file
  - lots of small programs that work together to solve larger problems
  - security, users, access, and groups
  - human-readable documentation included

Linux

- **Linux**: A kernel for a Unix-like operating system.
  - commonly seen/used today in servers, mobile/embedded devices, …

- **GNU**: A "free software" implement of many useful Unix-like tools.
  - many GNU tools are distributed with the Linux kernel

- **distribution**: A pre-packaged set of Linux software.
  - examples: Ubuntu, Fedora

- key features of Linux:
  - **open source software**: source can be downloaded
  - free to use
  - constantly being improved/updated by the community
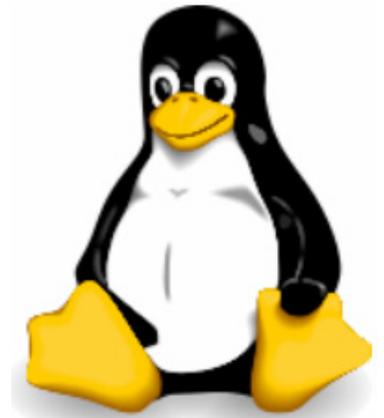
Features of Linux

- X-windows
- window managers
- desktop environments
  - Gnome
  - KDE

- How can I try out Linux?
  - CSE basement labs
  - `attu` shared server
  - at home (Live CD, VirtualBox, etc.)

- The Linux help philosophy: "RTFM" (Read the F***ing Manual)
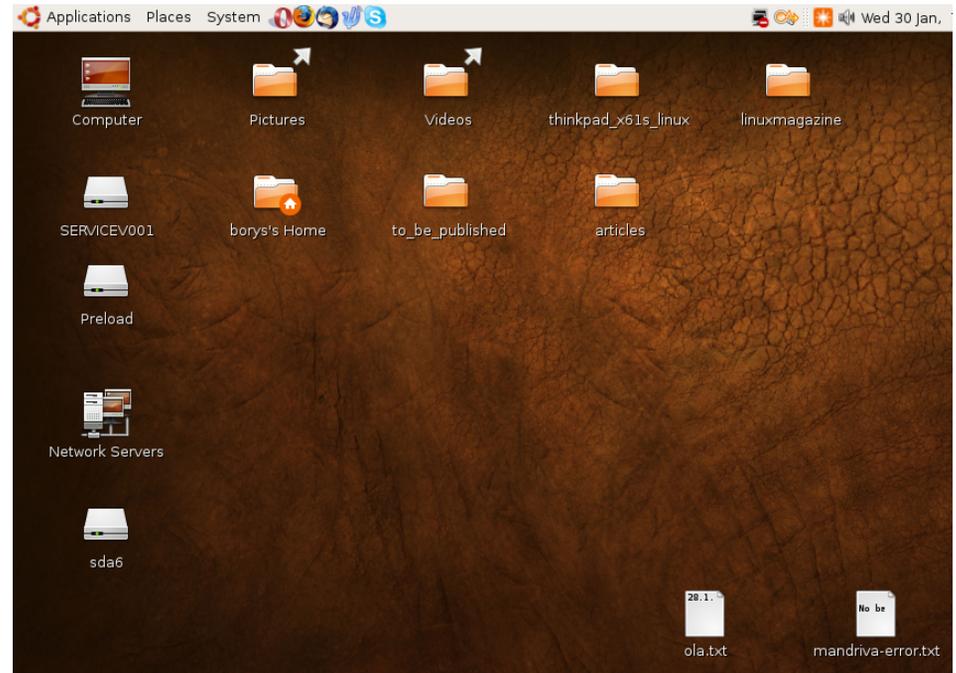
Exercises

- Install Linux and boot it up successfully.

- Load the course web site in Linux.

- Install a new game on Linux and play it.

- Get Linux to play an MP3.

Shell

- **shell**: An interactive program that uses user input to manage the execution of other programs.
  - `bash` : the default shell program on most Linux/Unix systems

- Why should I learn to use a shell when GUIs exist?
  - faster
  - work remotely
  - programmable
  - customizable
  - repeatable

- input, output, and errors
- directories: working/current directory, home directory

Shell commands

command	description
exit	logs out of the shell
ls	lists files in a directory
pwd	outputs the current working directory
cd	changes the working directory

```
$ pwd
/homes/iws/stepp
$ ls
banner  Desktop  files.txt  names.txt  students.txt
$ ls -l
total 396
-rwxr-xr-x 1 stepp fac_cs   8608 2009-04-01 07:26 banner
drwxr-xr-x 2 stepp fac_cs   4096 2007-11-10 09:29 Desktop
-rw-r--r-- 1 stepp fac_cs    598 2009-04-03 12:11 files.txt
-rw-r--r-- 1 stepp fac_cs   8116 2009-04-03 11:27 names.txt
-rw-r--r-- 1 stepp fac_cs  29644 2009-04-03 11:27 students.txt
$ cd Desktop
$ ls
-rw-r--r-- 1 stepp fac_cs   1527 2009-04-07 11:35 todo.txt
$ cd ..
$ exit
```