

---

# 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

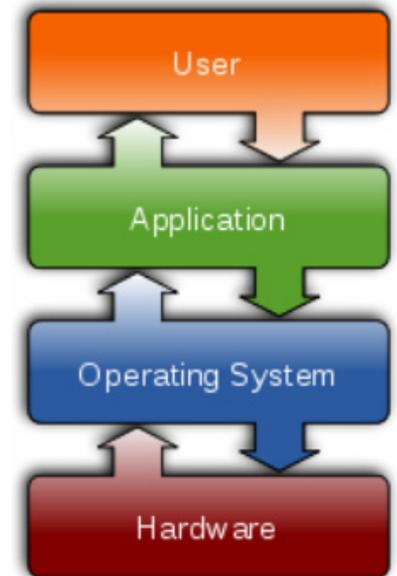
---

- 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



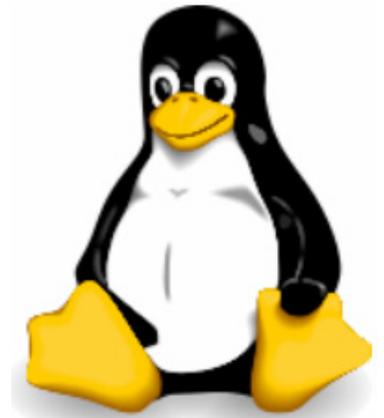
The screenshot shows a terminal window with several open windows: xcasele, root@:~ (terminal), xterm, xbuff, xman (Manual Browser), and o'clock (clock). The Manual Browser window is active, displaying the manual page for xset(1). The manual page content is as follows:

```
XSET(1) XSET(1)
NAME
xset - user preference utility for X
SYNOPSIS
xset [-display display] [-b] [b on/off] [b [volume [pitch [duration]]]
[[-]bc] [-c] [c on/off] [c [volume]] [[+|-]dpm] [dpm standby [ suspend
[ off]]] [dpm force standby/suspend/off/on] [[+|fp[+]]
path[,path[...]]] [fp default] [fp rehash] [[-]led [integer]] [led
on/off] [m[ouse] [accel_mult[/accel_div] [threshold]]] [m[ouse]
default] [p [pixel color] [[-]r [keycode]] [r on/off] [r rate delay
[rate]] [s [length [period]]] [s blank/noblank] [s expose/noexpose] [s
on/off] [s default] [s activate] [s reset] [q]
DESCRIPTION
This program is used to set various user preference options of the display.
```

# Linux

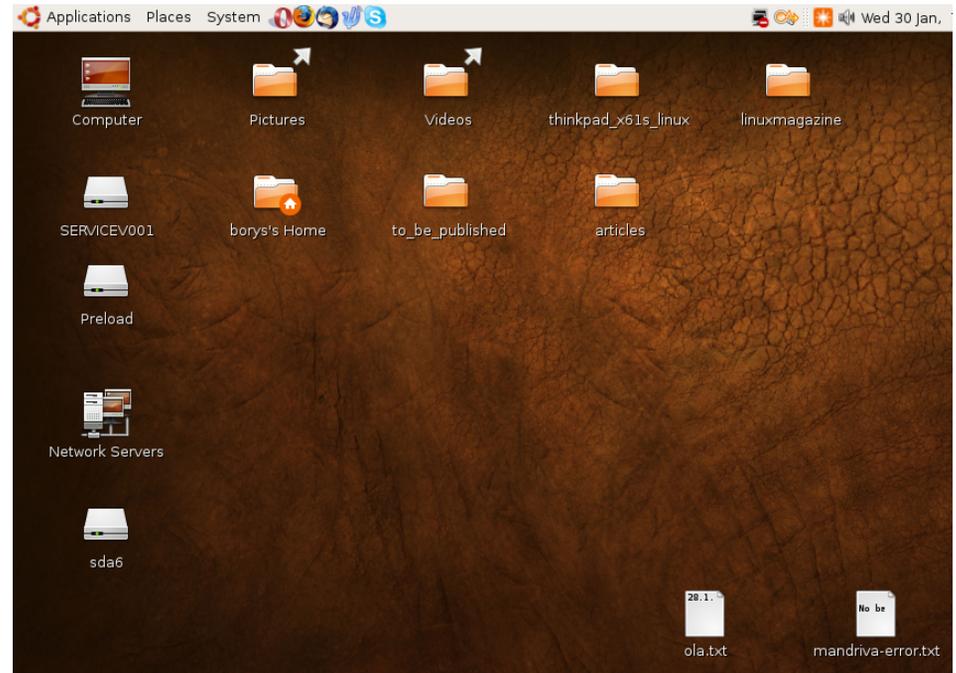
---

- **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
```