Lecture 1

Introduction, logging in, file transfer, getting help

COP 3344 Introduction to UNIX
Fall 2007

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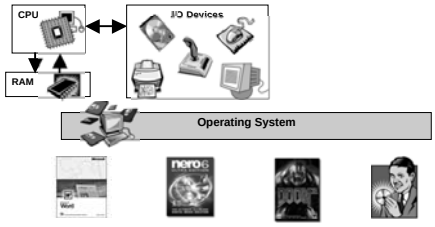
Brief History

- Dennis Ritchie and Ken Thompson of Bell Laboratories developed the Unix operating system in the early 1970's
  - Unix is a "pun" on Multics. Multics was a joint project of many companies and universities designed to be a leap forward in OSs. Multics contributed many ideas to OS development but failed as a useful OS.
  - Thompson needed to build an OS for a PDP-7 (9 Kbytes of main memory) and did so with the help of Ritchie (who also developed the C language with Brian Kernighan). This became Unics, and then Unix.

Varieties of Unix

- Developed at Bell Labs and AT&T
  - Latest version from AT&T is System V Release 4
- University of California Berkeley
  - Latest version was 4.4 BSD
- Commercial versions
  - SunOS, Solaris, SCO Unix, Aix, HP/UX, Ultrix
- Freely available versions
  - Linux (Linus Torvalds created for PCs), NetBSD, FreeBSD
- Linux Distributions (Linux kernel core + parts of Gnu etc.)
  - Fedora Core (Red Hat), SUSE Linux (Novell), Ubuntu, Mandriva, Gentoo, Debian
- Posix
  - A standard for Unix like operating systems

Basic System Components & OS



Basic Components

- CPU (Central Processing Unit, "Processor")
  - Brain
- Main Memory (RAM)
  - Temporary Workspace
- I/O (Input/Output)
  - Keyboard, Mouse
  - Monitor
  - Mass Storage (Hard Drives, CD-ROM)
- Operating System
  - Oversees interaction of hardware components
  - Provides interface between software and hardware
  - Provides interface to user
  - Most common use is running programs and managing "files"

Major Components of the Unix OS

- Kernel
  - The master control program
  - Schedules tasks and switching to provide multitasking and multi-user operation
  - Manages resources
- Shell
  - Interprets user commands
  - Passes user commands to the kernel for execution (executes programs)
- File System
  - Information organized as files and specialized files called directories
- Utilities
  - Software tools provided as part of the OS, often called commands

Some Definitions

- Executable
  - A program in a form that can be executed by the OS
- Process
  - The activation or instantiation of an executable
- Daemons
  - Processes spawned by the kernel (OS) to perform tasks on behalf of OS to manage system resource
- Filters
  - General purpose utilities transforming an input stream to an output stream while doing well-defined processing

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Logging on to a CS Machine

- Machines
  - Shell (shell.cs.fsu.edu) – use this one generally (Linux OS)
  - Linprog (linprog.cs.fsu.edu) – use for programming (actually a stack of linprog1 – linprog4, Linux OS)
  - Prog (prog.cs.fsu.edu) – use for programming (prog1 – prog4, Solaris OS)
- SSH (Secure Shell)
  - Use an SSH client program to connect to CS machines
    - From Unix machines: `ssh -X username@machine`
  - SSH software for home use can be obtained from http://usl.fsu.edu/free.html
  - Use sftp to transfer files
    - From Unix machines: `sftp -X username@machine`
    - `put` *`filename`* to put a file
    - `get` *`filename`* to get a file
- New Account Application
  - http://www.cs.fsu.edu/sysinfo/newstudent.html
  - Use SSH Client to connect to `shell.cs.fsu.edu`
  - username: **newacct**
  - password: **newacct**

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Variety of Shells

- Some aspects
  - Prompt ($, %, >, machine you are on, etc)
  - History mechanism (arrow keys), string completion (tab)
- Different shells
  - sh: Bourne shell, (S.R. Bourne, good scripting capabilities)
  - csh: C shell, (UC Berkeley, closer to C syntax)
  - ksh: Korn shell, (David Korn, better interactivity)
  - bash: Bourne-again shell (built on sh with more features)
  - tcsh: T shell: (Tenex shell) similar to C shell, default on Linux /Intel installations, default on CS accounts

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Create a file using `cat`

- `shell> cat >> file1`
  `This is my first file`
  `I hope this works!` <CTRL-D>
- `shell> ls`
  - You will see `file1` listed
- `shell> more file1`
  - You will see the contents of *file1* listed

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Getting help

- Use `man` or `info`
  - `shell> man cat`
  - `shell> info cat`
- Look up the specifications
  - http://www.unix.org/single_unix_specification/
- Search on google
  - `Unix command cat`

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