CS1101: Lecture 2
An Introduction to UNIX

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Lecture Overview

- What is UNIX?

- UNIX Versions;

- Computer Hardware;

- User-Modes & Computer Networks;

- The Operating System;

- Multi-Tasking & Time-Sharing;

- The Major Components of UNIX;

- Window Managers.

CS1101: Systems Organisation

What is UNIX?

- UNIX is an *operating system*

- An operating system is an important kind of software that manages the resources of the computer;

- "Master control program" for the entire computer system – hardware and software.

CS1101: Systems Organisation

UNIX Versions

- UNIX originated the AT&T Laboratories;

- Much of the subsequent development ocurred at the University of California at Berkeley;

- BSD – Berkeley Software Distribution;

- UNIX is now a family of operating systems:

  - AIX from IBM;
  - HP-UX from Hewlett-Packard;
  - GNU Linux from Free Software Foundation;
  - Solaris from Sun Microsystems;
  - many, many more ...

- We will be using a version of Linux called SuSE 7.2 is the labs.

Computer Hardware

Computers comprise four essential components;

- **Central processing unit (CPU)** performs the calculations and manipulates data;

- **Main memory (RAM – Random Access Memory)** is the place where the CPU looks for instructions and data to process. Also known as primary memory. Therefore, access needs to be fast. Temporary data storage.

- **Mass Storage (external/secondary memory)** is where data which is not immediately needed by the computer is placed mass storage. Access is much slower. Usually in the form of magnetic-disks. More permanent data storage.

- **Input/Output (I/O) devices** are used to move information to and from the computer. For example, keyboard, mouse, video display and printer.

Multi-Tasking & Time-Sharing

- UNIX is a *multi-tasking* operating system – enabling the computer to work on more than one task at a time;

- With UNIX, you can run several programs "in the background" while you work on another "in the foreground";

- *Multi-tasking* – performing multiple tasks simultaneously;

- *Time-Sharing* – switching rapidly back and forth between tasks;

- UNIX is a *multi-user* operating system – it can interact with more than one user at a time.

User-Modes & Computer Networks

- *Single-user* computer - one keyboard, one display;

- *Multi-user* computer - many users access a common host (or set of host) computer(s) over a computer network;

- A computer network is a collection of computers which are connected together for the purposes of sharing resources;

The Major Components of UNIX

- **Kernel** – master control program. It manages the machine resources, scheduling (e.g. for multi-tasking) etc.

- **Shell** – interprets user commands and passes them to the kernel;

- **File System** – organises information into files and directories;

- **Utilities** – programs for text-editting, programming, communications, database management etc.

- To take advantage of the multi-tasking capabilities of UNIX, various *window managers* are available which allow the user to interact with the operating through multiple *windows* of a *graphical user-interface.*