Operating Systems

Steven Hand

Michaelmas Term 2010

12 lectures for CST IA

Course Aims

- This course aims to:
  - explain the structure and functions of an operating system,
  - illustrate key operating system aspects by concrete example, and
  - prepare you for future courses. . .
- At the end of the course you should be able to:
  - compare and contrast CPU scheduling algorithms
  - explain the following: process, address space, file.
  - distinguish paged and segmented virtual memory.
  - discuss the relative merits of Unix and NT. . .

Course Outline

- Introduction to Operating Systems.
- Processes & Scheduling.
- Memory Management.
- I/O & Device Management.
- Protection.
- Filing Systems.
- Case Study: Unix.
- Case Study: Windows NT.

Recommended Reading

- *Concurrent Systems* or *Operating Systems*
  Bacon J [and Harris T], Addison Wesley 1997 [2003]
- *Operating Systems Concepts (5th Ed.)*
  Silberschatz A, Peterson J and Galvin P, Addison Wesley 1998.
- *The Design and Implementation of the 4.3BSD UNIX Operating System*
  Leffler S J, Addison Wesley 1989
- *Inside Windows 2000 (3rd Ed)* or *Windows Internals (4th Ed)*
  Solomon D and Russinovich M, Microsoft Press 2000 [2005]

What is an Operating System?

- A program which controls the execution of all other programs (applications).
- Acts as an intermediary between the user(s) and the computer.
- Objectives:
  - convenience,
  - efficiency,
  - extensibility.
- Similar to a government. . .