Operating Systems And Networks

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Chapter 1

Lecture 1

1.1 Outline

- What is an Operating System
- Course topics and grading
- History, development and concepts of Oss
- Different kinds of Computer Systems
- Concept of virtual computer

1.2 What is a system?

A system is an inter-related set of components with an identifiable boundary working together for some purpose.

System can be natural or fabricated:

- Natural systems: human body or solar system
- Fabricated systems: cycle, bus, etc.

1.2.1 Characteristics of a system

- Components:
  - A system is made up of components
  - A compenent is either an irreducible part or aggregation of parts that make-up a system. A component is also called a sub-system.
- Interrelated:

  - The components of interrelated
  - Dependence of one subsystem on one or more subsystems.

- Boundary:
  - A system has a boundary, within which all of its components are contained and which establishes the lmits of a separating the system from other systems.

- Purpose:
  - The overall goal of a function of a system.
  - The system's reason for existing.
  - If you want to design any system, first you need a purpose.

- Environment:
  - Everythin external to the system that interacts with the system.

- Interface:
  - Point of contact where a system meets its environment ot subsystems meet each other.

- Constraint:
  - A limit what a system can accomplish: Capacity, speed or capabilities.

- Input:
  - Whatever a system takes from its environment in order to fulfull its purpose.

- Output:
  - Whatever a system returns to the envrionment.

1.3 Important System Concepts

1.3.1 Decomposition

- It deals with being able to break down a system into its components.
- Decomposition results in smaller and less complex pieces which are easier to conqour.
- Decomposing a system allows to focus on a particular part of system.

1.3.2 Modulariy

- Dividing a system into chunks or modules of uniform size.
- Can edit, replace or add another module without effecting the rest of the system.
- Helps in reducing dependencies between systems.

1.3.3 Conesion

- TODO

1.4 What is an operating system?

Operating system is a subsystem of a tool which faciliates the operation of the tool.

For a user, the operating system abstracts the machine part in terms of simple services by hiding the details of the machine. The OS can provide services to users or other subsystems.

1.5 What is a computer operating system?

A computer is also a tool that contains a machine part and an operating part. For a computer, the operating system abstracts the underlying hardware in terms of simple services by hiding the details of the hardware.

For the rest of the course, operating system refers to computer operating system.

The operating system sits on top of the hardware interacts with the system and application programs. You cannot interact with the hardware directly. You have to interact with the OS to interact with the hardware.

Book Defination A program that acts as an intermediary between a user of a computer and the computer hardware.

Operating system goals Make the computer system convenient to use, Use the hardware in an efficent way.

1.6 OS Definitions

- Resource Allocator: Manages and allocates resources.
- Control Program: Controls the execution of user programs and operations of I/O devices.
- Kernal: The one program running all the time.