SNS COLLEGE OF ENGINEERING

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Department of Information Technology

Operating Systems

Lecture Series 1 : Introduction

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What is an Operating System?

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

Operating system goals:

- Execute user programs and make solving user problems easier
- Make the computer system convenient to use
- Use the computer hardware in an efficient manner

Computer System Structure:

Computer system can be divided into four components:

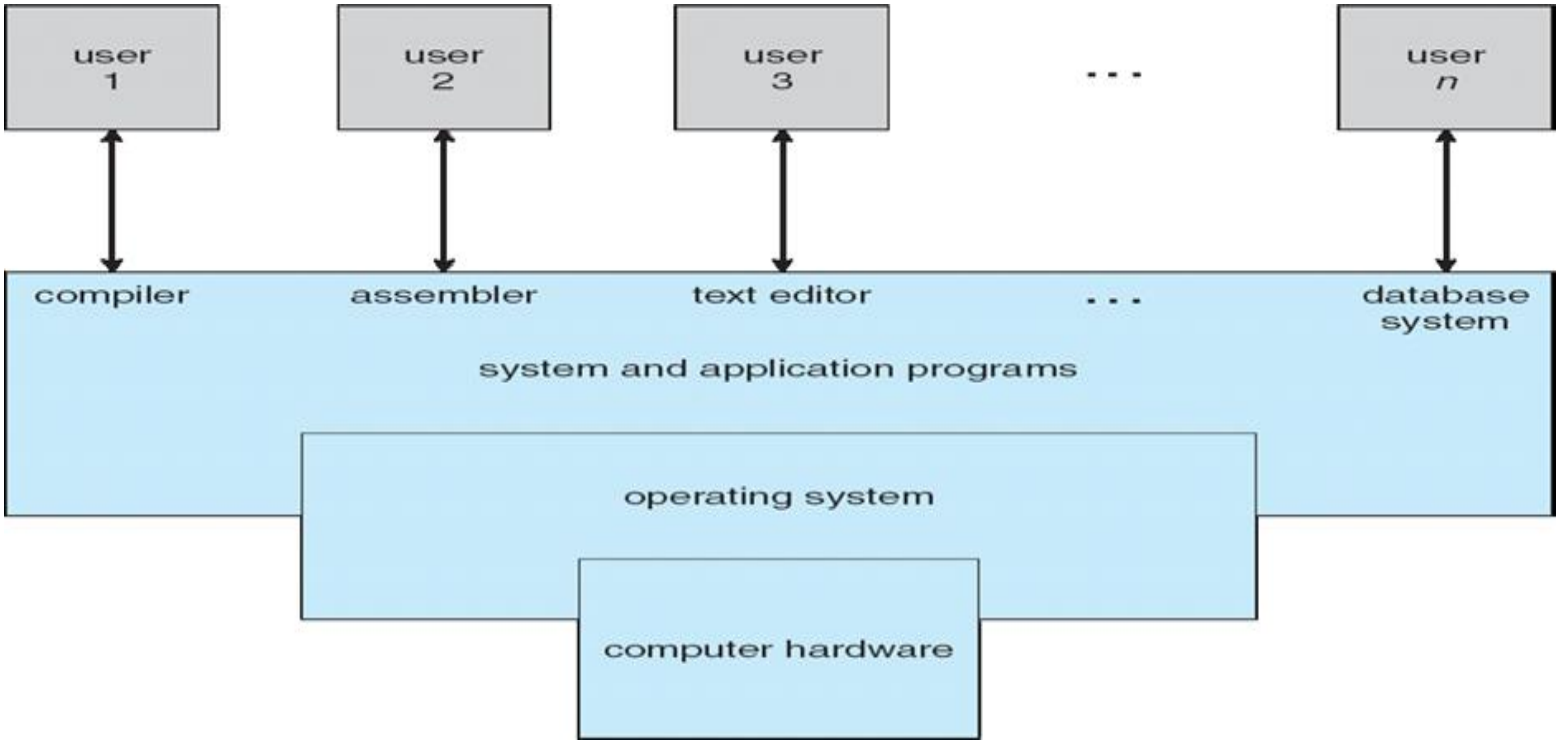
Hardware:
- provides basic computing resources
- CPU, memory, I/O devices

Operating system
- Controls and coordinates use of hardware among various applications and users

Application programs
- define the ways in which the system resources are used to solve the computing problems of the users
- Word processors, compilers, web browsers, database systems, video games

Users
- People, machines, other computers

Computer System Structure:



Operating System Definition

- **OS is a resource allocator**
  - Manages all resources
  - Decides between conflicting requests for efficient and fair resource use

- **OS is a control program**
  - Controls execution of programs to prevent errors and improper use of the computer

- The one program running at all times on the computer" is the kernel.
- Everything else is either
  - a system program (ships with the operating system) , or
  - an application program.

What Operating Systems Do:

- Users want convenience, ease of use and good performance
- Don’t care about resource utilization
- But shared computer such as mainframe or minicomputer must keep all users happy
- Users of dedicate systems such as workstations have dedicated resources but frequently use shared resources from servers
- Handheld computers are resource poor, optimized for usability and battery life
- Some computers have little or no user interface, such as embedded computers in devices and automobiles

Computer Startup

- Bootstrap program is loaded at power-up or reboot
  - Typically stored in ROM or EPROM, generally known as firmware
  - Initializes all aspects of system
  - Loads operating system kernel and starts execution