



OPERATING SYSTEM

Introduction to OS

Introduction

Popular OS

OS Views

OS and its kernel



Introduction

- An Operating System is a program that acts as an intermediary/interface between a user of a computer and the computer hardware.
- OS goals:
 - Control/execute user/application programs.
 - Make the computer system convenient to use.
 - Ease the solving of user problems.
 - Use the computer hardware in an efficient manner.
- OS can be viewed from:
 - User: OS as user interface
 - Hardware: OS as resource manager, control program, command executer & virtual machine



Popular OS

- **Microsoft Windows**
 - Introduced its OS in 1980s (MS-DOS)
 - Windows 1.0, 2.0, 3.0, 3.x, 95, 98, 2000, ME, XP, Vista, 7, 8, 10(beta)
 - Windows Server 2000, 2003, 2008, 2012
- **Novell's Netware**
 - Was popular in 1980s
 - Used for LANs (allows PC to share resources)
- **Mac OS**
 - Developed in 1980s, only for Apple Macintosh Systems
 - 1st GUI O.S
 - Mac OS X 10.0, 10.1, ... ,10.11
- **Unix**
 - Developed in 1969 by AT&T (Bell Laboratory)
 - For Mini computers
 - Contains all possible features (Mother of OS)
 - In 1980, its standardized version was introduced



Popular OS

(Continued)

- Other OS derived from Unix
 - Sun Solaris
 - Product of Sun Solar System
 - Used to handle ecommerce & web services
 - SunOS 4.1, 5.0, 5.1, ... , 5.11
 - BSD (Berkeley Software Distribution)
 - Free OS
 - 1970s, University of California, Berkeley
 - Current OS: FreeBSD, Dragonfly BSD etc.
 - Linux
 - Introduced by Linus Torvalds in 1991
 - Free & open source OS
 - Many distributions are available, e.g. SUSE, Fedora (Red Hat, Cent OS), Ubuntu etc.



Compression

Windows

- Facilities
 - Runs on wide range of H/W
 - Many Built-in Utilities
 - Many Utilities/software available
- Problems
 - Less Secure
 - Not efficient as Server
 - Needs reboots when H/W, S/W or registry changes

Linux

- Facilities
 - Runs on wide range of H/W
 - Large no: of user interface types
 - Secure & Stable
- Problems
 - Difficult to learn
 - Limited no: of application software

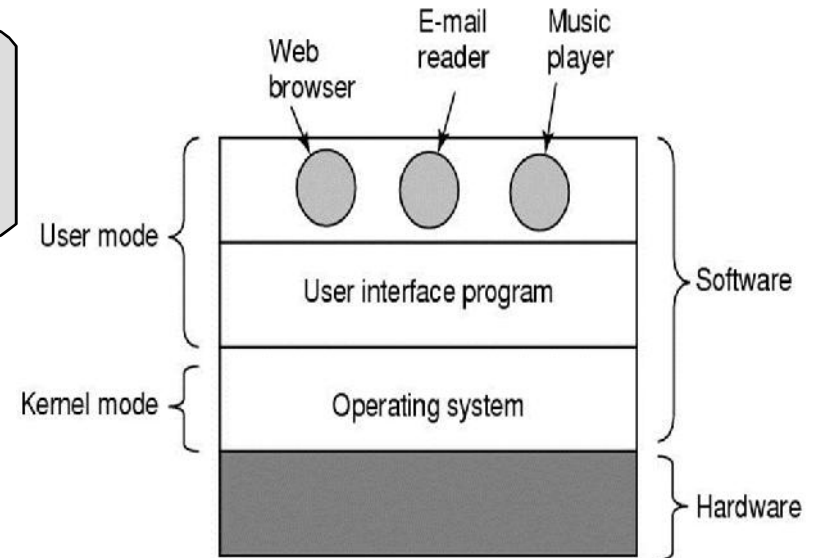
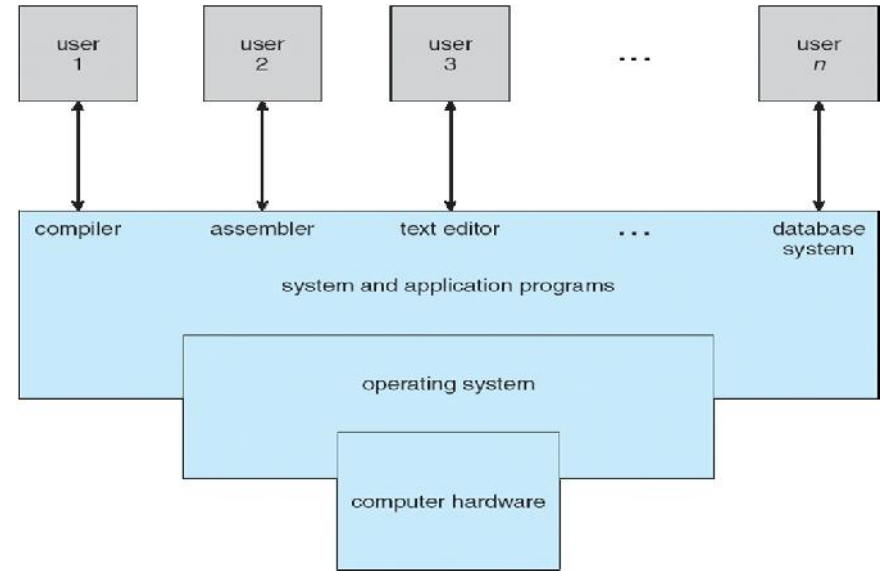
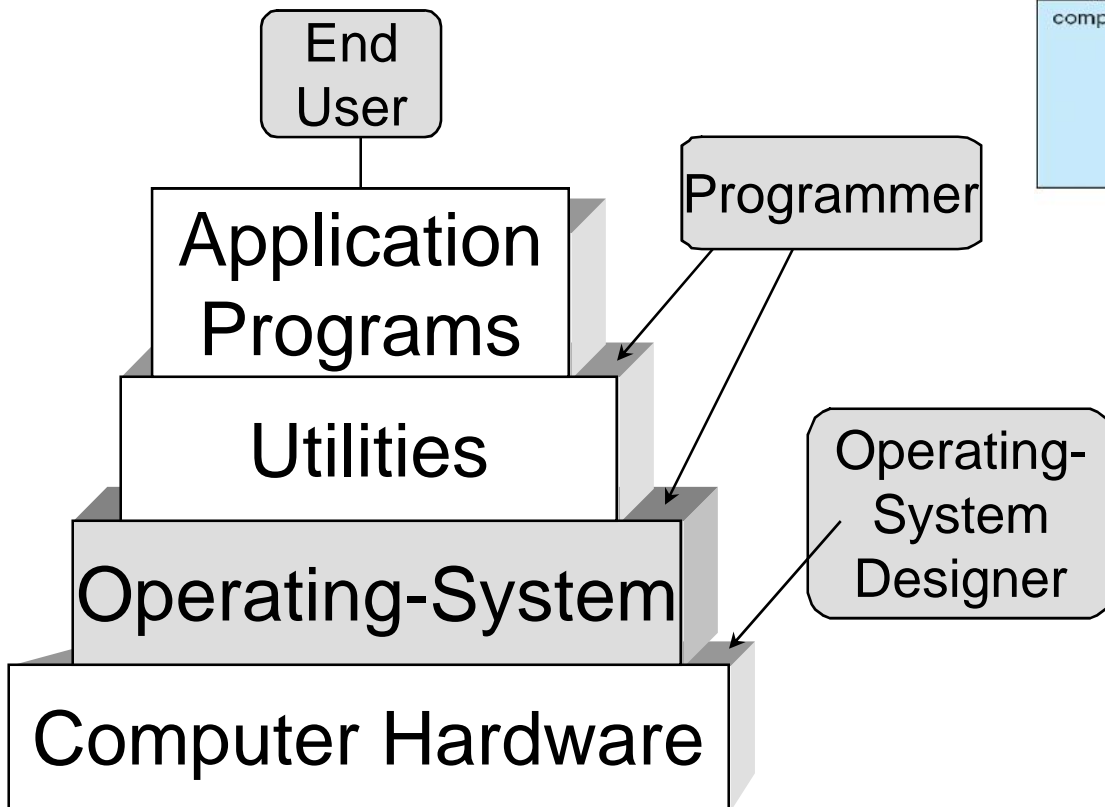
Mac OS

- Facilities
 - Rich GUI
 - Easy to use
 - Secure & Stable
- Problems
 - Only for Mac Systems
 - Mac H/W are much expensive
 - Fewer application software available



O.S Views

- OS as User interface

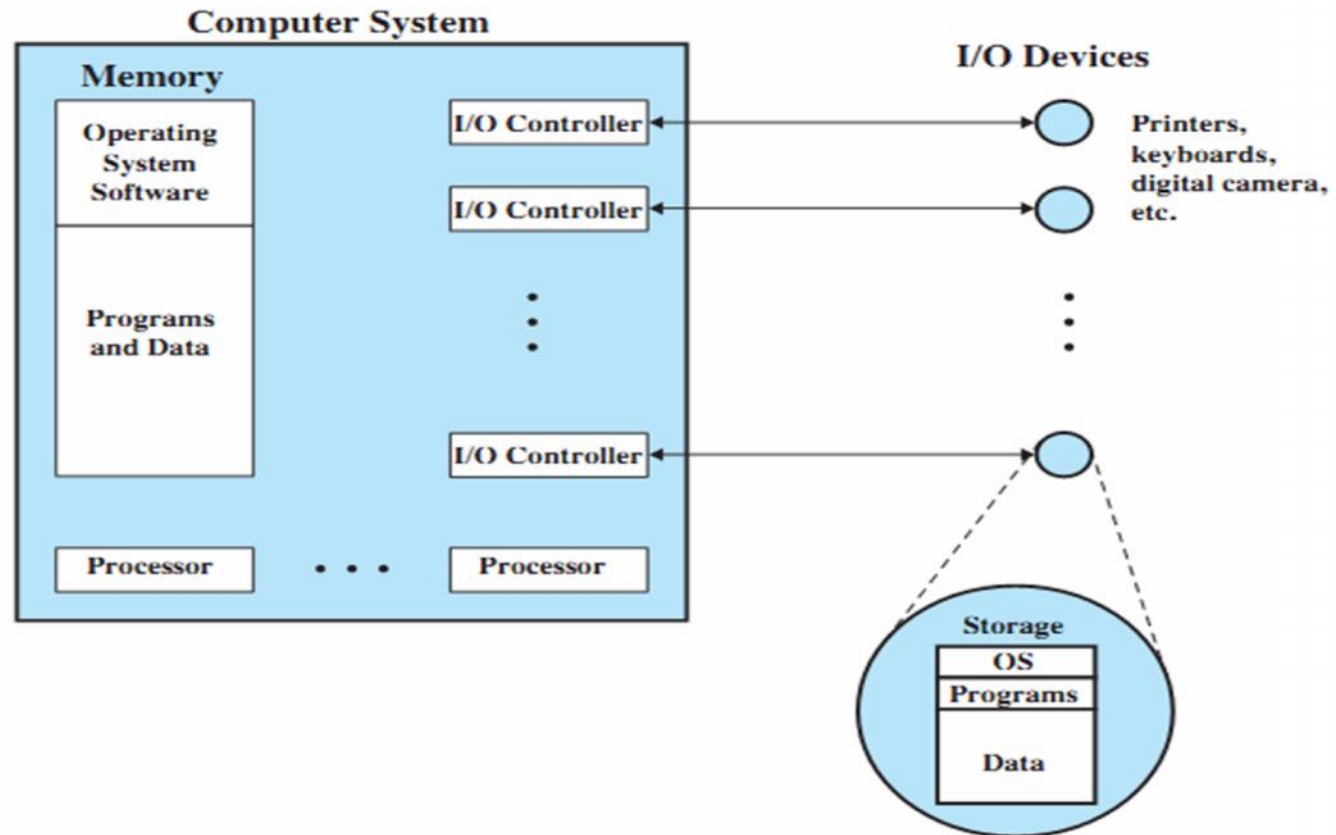




OS Views

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- OS as Resource Manager

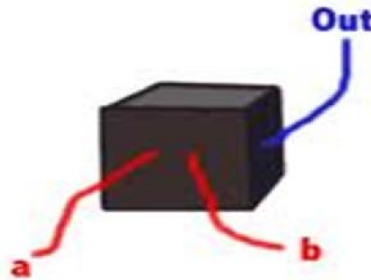




OS Views

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- Control Program:
 - Manages all the components of a complex computer system in an integrated manner.
 - Controls the execution of user programs and I/O devices to prevent errors and improper use of computer resources.
 - Sort of a black box view



- Looks over and protects the computer: Monitor, Supervisor, Executive, Controller, Master, Coordinator



OS Views

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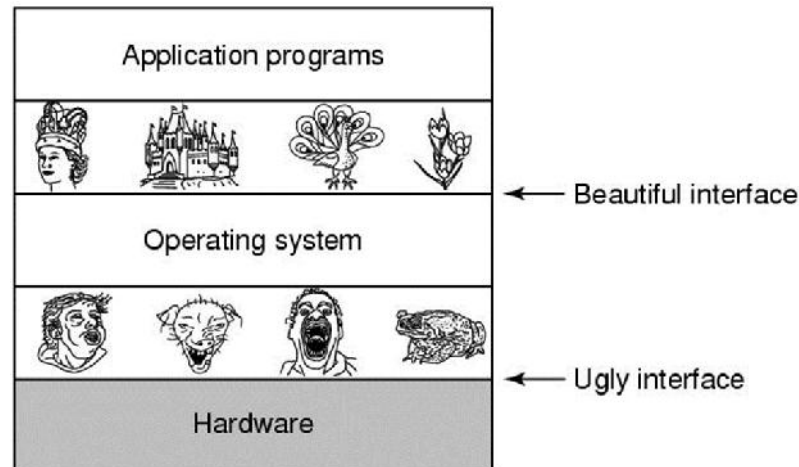
- OS as Command Executer
 - Interfaces between the users and machine.
 - Supplies services/utilities to users.
 - Provides the users with a convenient CLI (Command Language Interface), also called a Shell (in UNIX), for entering the user commands.
 - Sort of a top-down view.



OS Views

(Continued)

- Operating System as a Virtual Machine:
 - An interface between the user and hardware that hides the details of the hardware (e.g., I/O).
 - Constructs higher-level (virtual) resources out of lower-level (physical) resources (e.g., files).

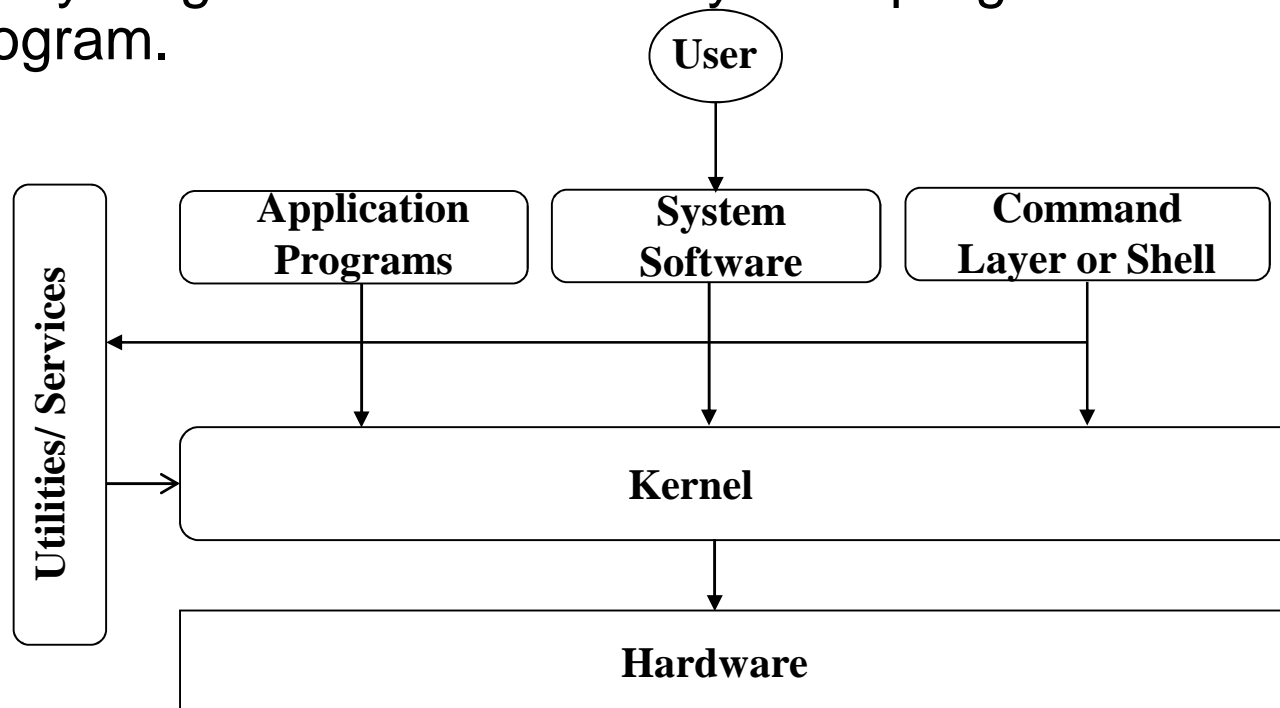


- Definition: OS is a collection of software enhancements, executed on the hardware, culminating in a high-level virtual machine that serves as an advanced programming environment.



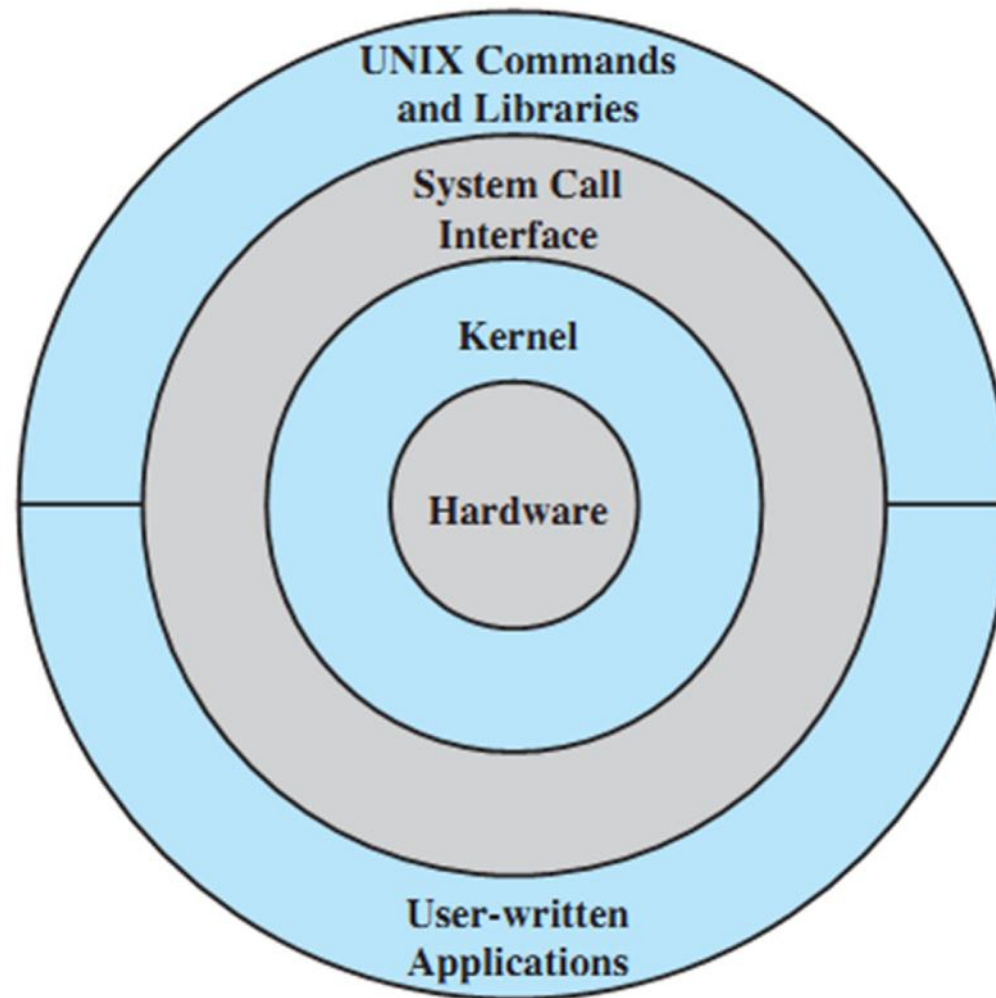
OS & Kernel

- “The one program running at all times on the computer” is the Kernel.
- Kernel manage & process hardware requests from programs and make it understandable form for hardware
- Everything else is either a system program or an application program.





General Unix Kernel Architecture





Questions

