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CHAPTER -1
INTRODUCTION OF OPERATING SYSTEM

HARDWARE
- CPU, Memory, Hard Drive

OPERATING SYSTEM
- Windows, Apple OS X, Linux

END USER

WHAT IS OPERATING SYSTEM

- OS is program that controls the execution of application programs.
- Interface between application and hardware.
- OS is software that manages the computer hardware.
- Efficiency is the one of the parameter for os.
- Memory is not free then user can not load new program into memory.
- OS consume some resource for operation.

PURPOSE OF OS

- OS provide interface between the computer hardware and user. It simplifies the user job like editing , coding, creation etc.

- Allocation & use of the computer resource among the programmer is controlled by OS.

- Operating system goals:

- Execute user programs and make solving user problems easier.

- Make the computer system convenient to use.

- OS manage all resource. A portion of OS is in main mory it is called kernel.

- Computer is a set of resources for, - data movement , storing of data , operation on data.

TYPES OF OS

➤ Batch System

➤ Multiprocessor system

➤ Distributed System

➤ Time Sharing System

➤ Clustered System

➤ Real Time Sharing

➤ Handheld System

➤ Network System

MULTIPROCESSOR OS

- **Multiprocessor system:.**

- More than one processor used.

- They share – Computer bus , system clock, I/O devices, Memory.

- It is possible for two processors to run in parallel.

- **Symmetric Multiprocessing:**

- Each processor runs an identical copy of the operating system and they communicate with one another as needed.

- **Asymmetric Multiprocessor:**

- Each processor is assigned a specific task.

- It uses master-slave relationship.

- Example: Windows NT.

DISTRIBUTED OS & REAL TIME OS

- **Distributed OS:**
- Run & control the resources of multiple machines.
- Provide Resource sharing across the boundaries of a single computer system.
- It looks user to an ordinary operating system but runs on multiple independent CPU.
- **Real time System:**
- Used to control autonomous system.
- In real time give input to the system, Process in the time limit and result is sent back.
- Main two types – Hard real time & Soft real time

BATCH OPERATING SYSTEM

- Batch is a sequence of user jobs.

- Each job independent of other job in the batch.

- Job is sequence of commands , programs and data that are combined into single unit.

- The users of batch operating system do not interact with the computer directly.

courtesy Argonne National Laboratory
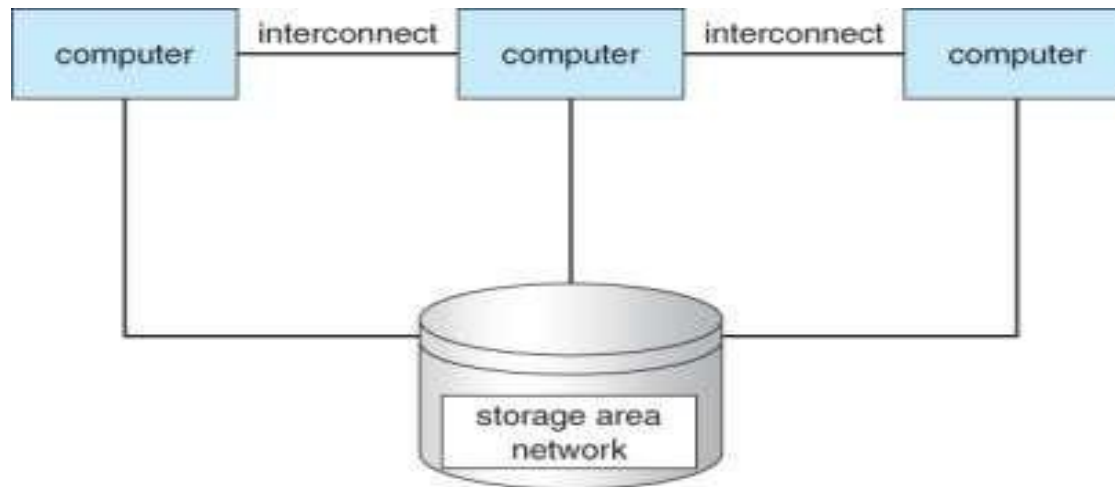
NETWORK OPERATING SYSTEM

- Runs on a server and provides server the capability to manage data, users, groups, security, applications, and other networking functions.

- The primary purpose of the network operating system is to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), a private network or to other networks.
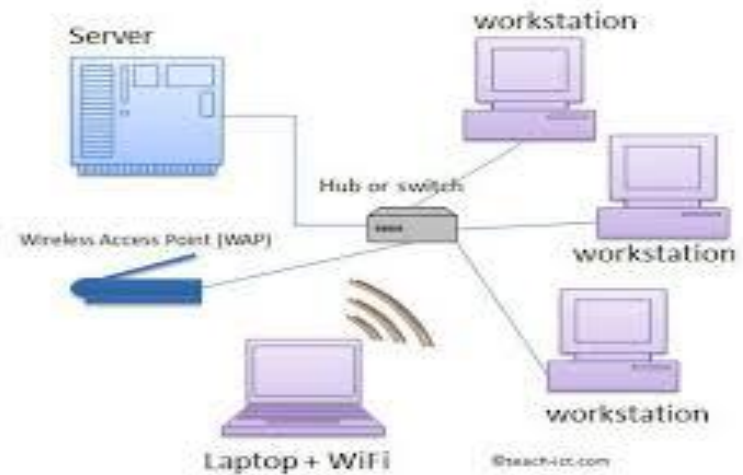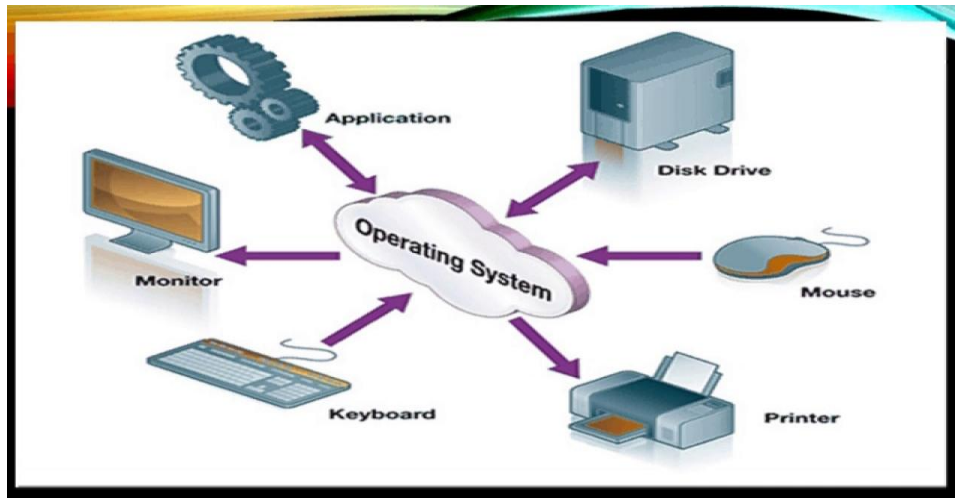
CLUSTERED OPERATING SYSTEM

- Clustered computers share storage and are closely linked via Local-area network (LAN) or a faster interconnection.

- Clustered System Combine the best feature of   both distributed OS and Multi processor system.

- A Group of connected computer working together called as one unit called clustered System
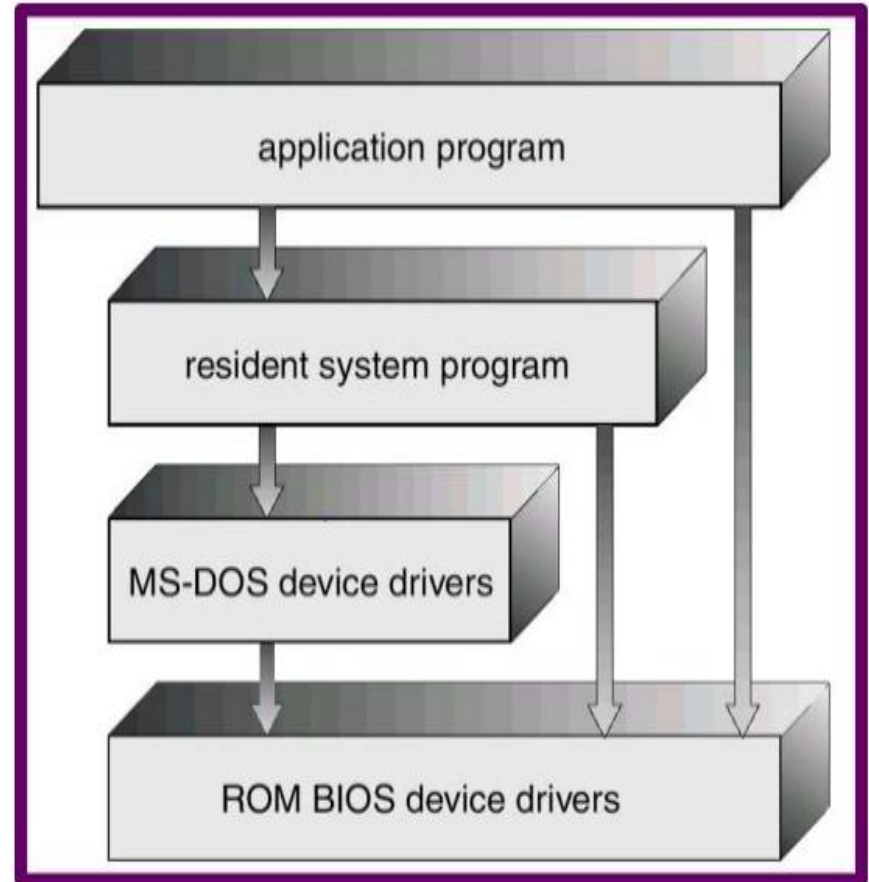
HANDHELD OPERATING SYSTEM

- Handheld OS known as Mobile Operating system such as Smartphone, tablet, PDA, or other mobile device.

- It's a combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a touch screen, cellular, Bluetooth, Wi-Fi, GPS mobile navigation, camera, video camera, speech recognition, voice recorder, music player, near field communication and infrared blaster.
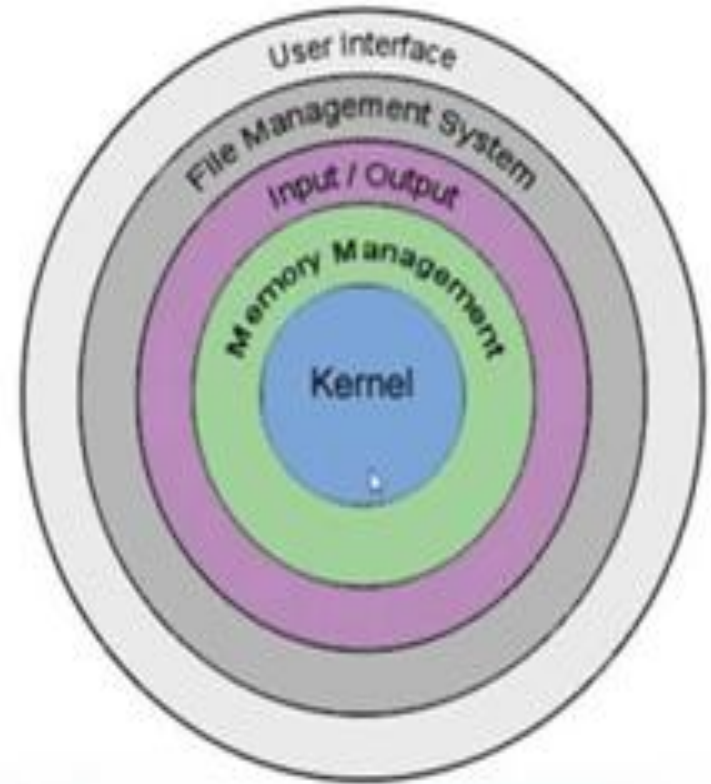
STRUCTURE OF OPERATING SYSTEM

- **Simple structure:**

- System - small, simple

- Interfaces and layers are not well separated .

- Limited by hardware

- Two separate parts kernel and system programs.

STRUCTURE OF OPERATING SYSTEM

- **Layered structure:**
- OS divided into number of pieces
- Bottom layer is called layer 0
- Top most layer is called layer N
- Layer N provide user interface.
- Layer provides services to upper and lower layer.
- First layer contains basic hardware to implement functions.
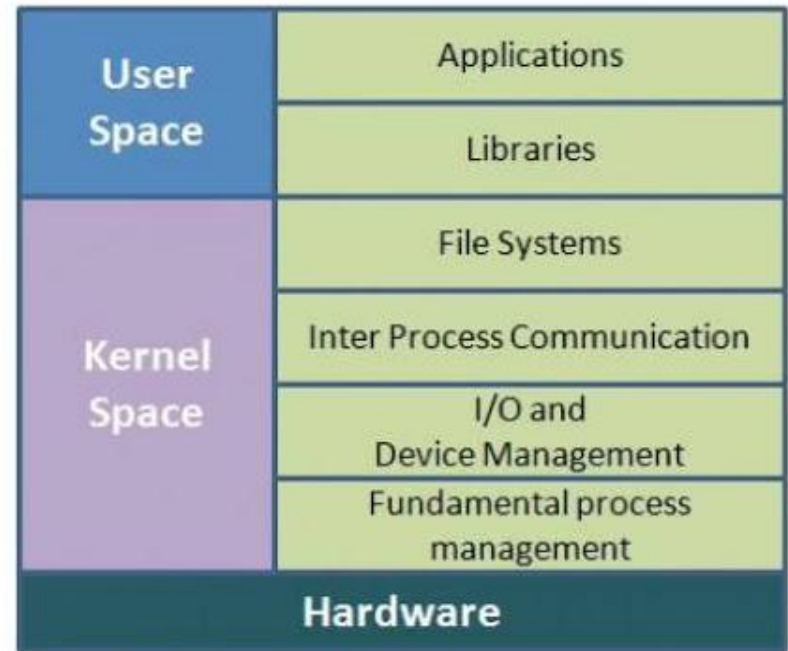- If error is not found then the system will work properly.

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STRUCTURE OF OPERATING SYSTEM

- **Monolithic kernel structure:**
- Traditional UNIX
- UNIX OS uses monolithic.
- Os run as single program in kernel mode.
- Most operation performed by kernel via system call.
- All services execute in the kernel address space.
- Kernel invoke function directly.
- Examples: windows 95,98, Linux , FreeBSD.

Monolithic Kernel

User Space	Applications
	Libraries
Kernel Space	File Systems
	Inter Process Communication
	I/O and Device Management
	Fundamental process management
Hardware	

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STRUCTURE OF OPERATING SYSTEM

- **Microkernel structure:**
- Microkernel provides minimal services like memory address space , IPC.
- Microkernel runs in kernel mode.
- Provide more security.
- Kernel size is small
- OS is easy to design, implement and install.
- Request may be serviced slower.
- It requires message passing.