

**Operating System** : An operating system is program that controls the execution of application programs and acts as an interface between the user of a computer and the computer hardware.

An operating system is the program that is loaded into the computer and coordinates all the activities among computer hardware devices. After the computer is turned on, OS is loaded into the machines. The process of loading an operating system into the computer is known as booting.

### **Components of OS :**

- 1. Memory Management** : Memory management is the function responsible for managing the computer's primary memory. The OS must manage the allocation of memory to processes and control the hardware that determines which memory locations a process may access.
- 2. Process Management** : A process is a executing program. It has its code, data, a certain set of resources allocated to it and one or more threads of execution through the code.
- 3. Device Management** : Information is sent through a computer's input and output devices. The OS tries to manage I/O devices in a manner that makes them efficiently shared among all processes requiring them.
- 4. File system Management** : Computers process information that must be transmitted, processed or stored. File systems are an abstract organized collection of file system objects.

### **Functions of operating system :**

1. Operating system interface between the user and the computer hardware.
2. Sharing hardware and software among users.
3. Preventing users from interfering with one another.
4. Scheduling resources among users.
5. Recovering from errors.
6. Handling network communications.

### **Types of Operating System**

Following are the major types of operating system –

- Disk Operating System (DOS)
- Windows Operating System
- Unix Operating System

**Disk Operating System** : MS-DOS is one of the oldest and widely used operating system. DOS is a set of computer programs, the major functions of which are file management, allocation of system resources, providing essential features to control hardware devices.

DOS commands can be typed in either upper case or lower case.

Features of DOS :

Following are the significant features of DOS –

- It is a single user system.
- It controls program.
- It is machine independence.

- It manages (computer) files.
- It manages input and output system.
- It manages (computer) memory.
- It provides command processing facilities.
- It operates with Assembler.

### Types of DOS Commands

Following are the major types of DOS Command –

- **Internal Commands** – Commands such as DEL, COPY, TYPE, etc. are the internal commands that remain stored in computer memory.
- **External Commands** – Commands like FORMAT, DISKCOPY, etc. are the external commands and remain stored on the disk.

**Windows Operating System** : The operating system window is the extension of the disk operating system. It is the most popular and simplest operating system; it can be used by any person who can read and understand basic English, as it does not require any special training. However, the Windows Operating System requires DOS to run the various application programs initially. Because of this reason, DOS should be installed into the memory and then window can be executed.

### Unix Operating System

- It is an operating system that has multitasking features.
- It has multiuser computer operating systems.
- It runs practically on every sort of hardware and provides stimulus to the open source movement.
- It has comparative complex functionality and hence an untrained user cannot use it; only the one who has taken training can use this system.
- Another drawback of this system is, it does not give notice or warn about the consequences of a user's action (whether user's action is right or wrong).

**Linux** is one of popular version of UNIX operating System. It is open source as its source code is freely available. It is free to use. Linux was designed considering UNIX compatibility. Its functionality list is quite similar to that of UNIX.

### Components of Linux System

Linux Operating System has primarily three components

- **Kernel** – Kernel is the core part of Linux. It is responsible for all major activities of this operating system. It consists of various modules and it interacts directly with the underlying hardware. Kernel provides the required abstraction to hide low level hardware details to system or application programs.
- **System Library** – System libraries are special functions or programs using which application programs or system utilities accesses Kernel's features. These libraries implement most of the functionalities of the operating system and do not requires kernel module's code access rights.
- **System Utility** – System Utility programs are responsible to do specialized, individual level tasks.

## Basic Features

- **Portable** – Portability means software can work on different types of hardware in the same way. Linux kernel and application programs support their installation on any kind of hardware platform.
- **Open Source** – Linux source code is freely available and it is a community-based development project. Multiple teams work in collaboration to enhance the capability of Linux operating system and it is continuously evolving.
- **Multi-User** – Linux is a multiuser system means multiple users can access system resources like memory/ ram/ application programs at the same time.
- **Multiprogramming** – Linux is a multiprogramming system means multiple applications can run at the same time.
- **Hierarchical File System** – Linux provides a standard file structure in which system files/ user files are arranged.
- **Shell** – Linux provides a special interpreter program which can be used to execute commands of the operating system. It can be used to do various types of operations, call application programs, etc.
- **Security** – Linux provides user security using authentication features like password protection/ controlled access to specific files/ encryption of data.

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