

Operating System

BBA 510113: Computer and Information Technology

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Operating System

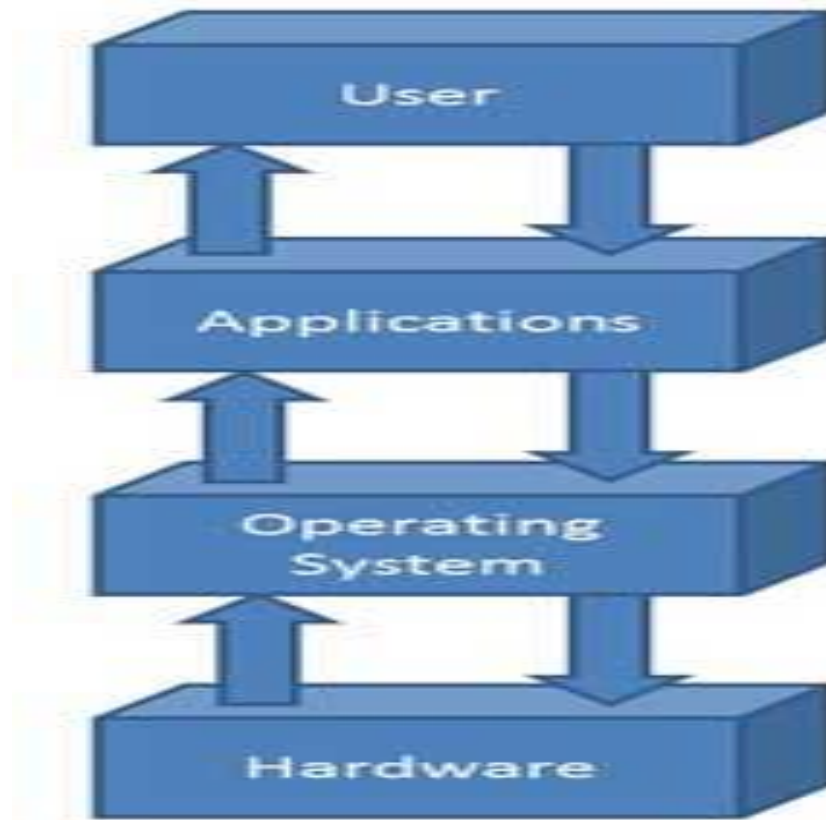


An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is a vital component of the system software in a computer system.

The Operating System is a program with the following features –

- An operating system is a program that acts as an interface between the software and the computer hardware.
- It is an integrated set of specialized programs used to manage overall resources and operations of the computer.
- It is a specialized software that controls and monitors the execution of all other programs that reside in the computer, including application programs and other system software.

Operating System



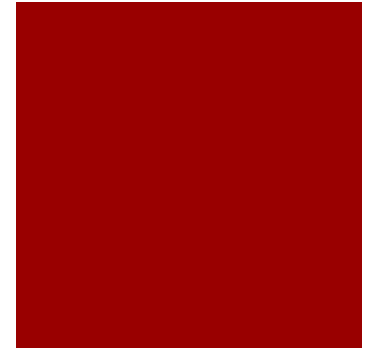
Objectives of Operating System



The objectives of the operating system are –

- To make the computer system convenient to use in an efficient manner.
- To hide the details of the hardware resources from the users.
- To provide users a convenient interface to use the computer system.
- To act as an intermediary between the hardware and its users, making it easier for the users to access and use other resources.

Objectives of Operating System



- To manage the resources of a computer system.
- To keep track of who is using which resource, granting resource requests, and mediating conflicting requests from different programs and users.
- To provide efficient and fair sharing of resources among users and programs.

Characteristics of Operating System



Here is a list of some of the most prominent characteristic features of Operating Systems –

- Memory Management – Keeps track of the primary memory, i.e. what part of it is in use by whom, what part is not in use, etc. and allocates the memory when a process or program requests it.
- Processor Management – Allocates the processor (CPU) to a process and de-allocates the processor when it is no longer required.

Characteristics of Operating System



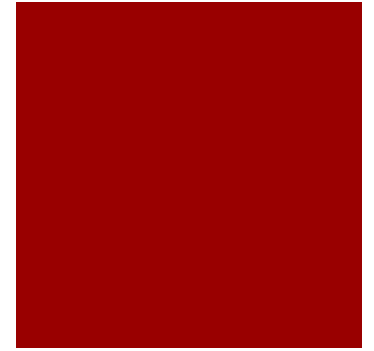
- Device Management – Keeps track of all the devices. This is also called I/O controller that decides which process gets the device, when, and for how much time.
- File Management – Allocates and de-allocates the resources and decides who gets the resources.
- Security – Prevents unauthorized access to programs and data by means of passwords and other similar techniques.
- Job Accounting – Keeps track of time and resources used by various jobs and/or users.

Characteristics of Operating System



- Control Over System Performance – Records delays between the request for a service and from the system.
- Interaction with the Operators – Interaction may take place via the console of the computer in the form of instructions. The Operating System acknowledges the same, does the corresponding action, and informs the operation by a display screen.
- Error-detecting Aids – Production of dumps, traces, error messages, and other debugging and error-detecting methods.
- Coordination Between Other Software and Users – Coordination and assignment of compilers, interpreters, assemblers, and other software to the various users of the computer systems.

Types of Operating System



Following are some of the most widely used types of Operating system.

- Simple Batch System
- Multiprogramming Batch System
- Multiprocessor System
- Desktop System
- Distributed Operating System
- Clustered System
- Realtime Operating System
- Handheld System

Types of Operating System



- **Simple Batch Systems**

In this type of system, there is no direct interaction between user and the computer. The user has to submit a job (written on cards or tape) to a computer operator. Then computer operator places a batch of several jobs on an input device. Jobs are batched together by type of languages and requirement. Then a special program, the monitor, manages the execution of each program in the batch. The monitor is always in the main memory and available for execution.

- **Multiprogramming Batch Systems**

In this the operating system picks up and begins to execute one of the jobs from memory. Once this job needs an I/O operation operating system switches to another job (CPU and OS always busy). Jobs in the memory are always less than the number of jobs on disk (Job Pool). If several jobs are ready to run at the same time, then the system chooses which one to run through the process of CPU Scheduling. In Non-multiprogrammed system, there are moments when CPU sits idle and does not do any work. In Multiprogramming system, CPU will never be idle and keeps on processing. Time Sharing Systems are very similar to Multiprogramming batch systems.

Types of Operating System

■ Multiprocessor Systems

A Multiprocessor system consists of several processors that share a common physical memory. Multiprocessor system provides higher computing power and speed. In multiprocessor system all processors operate under single operating system. Multiplicity of the processors and how they do act together are transparent to the others.

■ Desktop Systems

Earlier, CPUs and PCs lacked the features needed to protect an operating system from user programs. PC operating systems therefore were neither multiuser nor multitasking. However, the goals of these operating systems have changed with time; instead of maximizing CPU and peripheral utilization, the systems opt for maximizing user convenience and responsiveness. These systems are called Desktop Systems and include PCs running Microsoft Windows and the Apple Macintosh. Operating systems for these computers have benefited in several ways from the development of operating systems for mainframes.

Types of Operating System



- **Distributed Operating System**

The motivation behind developing distributed operating systems is the availability of powerful and inexpensive microprocessors and advances in communication technology. These advancements in technology have made it possible to design and develop distributed systems comprising of many computers that are interconnected by communication networks. The main benefit of distributed systems is its low price/performance ratio. Following are the two types of distributed operating systems used: 1) Client-Server Systems, 2) Peer-to-Peer Systems

- **Clustered Systems**

Like parallel systems, clustered systems gather together multiple CPUs to accomplish computational work. Clustered systems differ from parallel systems, however, in that they are composed of two or more individual systems coupled together. The definition of the term clustered is not concrete; the general accepted definition is that clustered computers share storage and are closely linked via LAN networking. Clustering is usually performed to provide high availability.

Types of Operating System



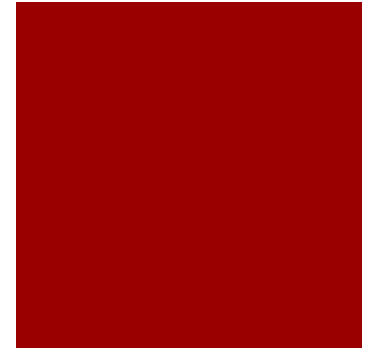
- **Real Time Operating System**

It is defined as an operating system known to give maximum time for each of the critical operations that it performs, like OS calls and interrupt handling. The Real-Time Operating system which guarantees the maximum time for critical operations and complete them on time are referred to as Hard Real-Time Operating Systems.

- **Handheld Systems**

Handheld systems include Personal Digital Assistants(PDAs), such as Palm-Pilots or Cellular Telephones with connectivity to a network such as the Internet. They are usually of limited size due to which most handheld devices have a small amount of memory, include slow processors, and feature small display screens.

Disk Operating System(DOS)



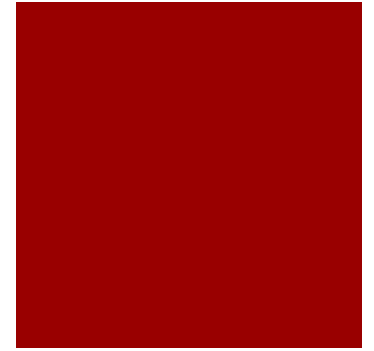
MS-DOS is one of the oldest and widely used operating system. DOS is a set of computer programs, the major functions of which are file management, allocation of system resources, providing essential features to control hardware devices.

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

Features of DOS

Following are the significant features of DOS –

Disk Operating System(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.

Disk Operating System(DOS)

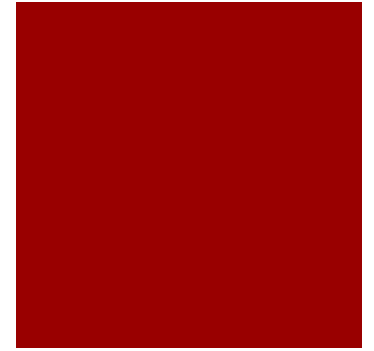


Types of DOS Commands

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.

Windows Operating System



Elements of Windows OS

Following are the significant element of Windows Operating System (WOS) –

- Graphical User Interface
- Icons (pictures, documents, application, program icons, etc.)
- Taskbar
- Start button
- Windows explorer
- Mouse button
- Hardware compatibility
- Software compatibility
- Help, etc.

Windows Operating System



Versions of Windows OS

Version	Year	Version	Year
Window 1.01	1985	Windows XP Professional x64	2005
Windows NT 3.1	1993	Windows Vista	2007
Windows 95	1995	Windows 7	2009
Windows 98	1998	Windows 8	2012
Windows 2000	2000	Windows 10	2015
Windows ME	2000	Windows Server 2016	2016
Windows XP	2001		

Unix Operating System



The Unix Operating System is the earliest operating system developed in 1970s. Let us consider the following points relating to the 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).

THANKS...

