

# Operating System: A Review

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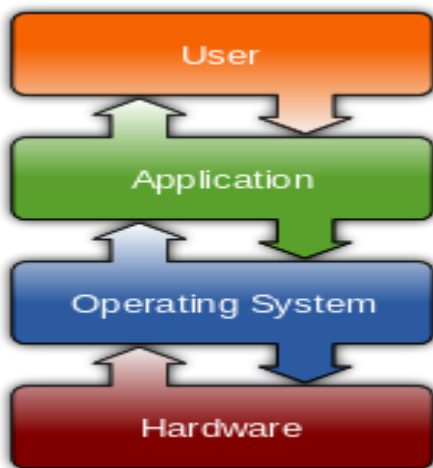
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**Abstract:** Computer use and application are in the midst of a major paradigm shift from the centralized, professionally managed facilities towards "computing for the masses" characterized by placing control and computing power right at the desks of millions of users. The range and extent of service provided by an OS depends various number of factors. OS acts as a manager of resources such as processor, memory, files and I/O devices.

**Keywords-**System; User; Device; Software

## I. INTRODUCTION

The operating system is the most important program that runs on a computer. It is the component of system software in a program. It manages the computer hardware and software. The operating system is a component of the system software in a computer system.



Operating system performs the following operations.

- Recognizes the input from the keyboard or mouse
- Sends output to the monitor
- Keeps track of files and directories on the disk
- Controls the peripheral devices such as disk drives and printers

## II. TYPES OF OPERATING SYSTEM

### A. Single User Operating System

It provides a platform for only one user at a time. They are popularly associated with Desk Top operating system, which run on standalone systems where no user accounts are required. Example: DOS

### B. Multi User Operating System

It provides regulated access for a number of users by maintaining a database of known users and refers to the computer system that supports two or more simultaneous users. Example: All mainframes computers.

### C. Distributed Operating System

Distributed Operating System is a model where distributed applications are running on multiple computers linked by communications. When computers in a group work in cooperation, they form a distributed system.

### D. Embedded Operating System

This type of operating system is used in embedded computer systems. It is operated on PDAs with less autonomy. It is compact and efficient to design.

### E. Real-time Operating System

A real-time operating system is an operating system that guarantees to process events or data within a certain short amount of time.

### F. Library Operating System

A library operating system is one in which the services that a typical operating system provides, such as networking, are provided in the form of libraries.



## III. STRUCTURE OF OPERATING SYSTEM

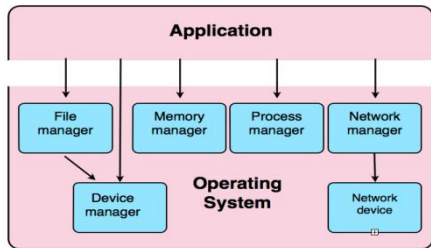
The structure of OS consists of 4 layers:

### A. Hardware

It is the collection of physical elements that constitutes a computer system like CPU, I/O devices, etc.

### B. Software (Operating System)

It is a set of instruction that directs a computer to perform specific operations.



### C. System Programs

It controls some aspects of operations of computer.

### D. Application Programs

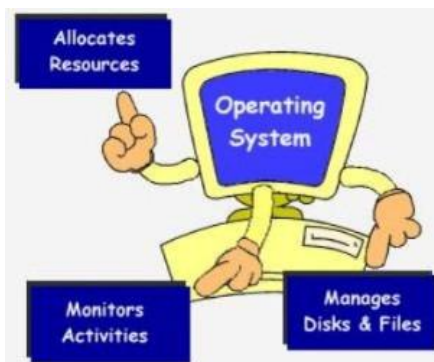
A program that is designed to perform a specific function directly for the user or for another application program is called application program. Example: word processor, database program etc.

## IV. MEMORY STORAGE AND MANAGEMENT

Memory management is the functionality of an operating system which handles or manages primary memory i.e. at the system level. The essential requirement of memory management is to provide ways to dynamically allocate portions of memory to programs at their request, and free it for reuse when no longer needed. Memory management provides protection by using two registers, a base register and a limit register.

## V. CACHE MEMORY

Cache memory is fast and expensive. The basic purpose of cache memory is to store program instructions that are frequently re-referenced by software during operation. The basic purpose of cache memory is to store program instructions that are frequently re-referenced by software during operation.



## VI. MEMORY MANAGEMENT TECHNIQUES

- Single contiguous memory allocation
- Partitioned memory allocation
- Paged memory management
- Segmented memory management

### A. Single Contiguous Memory Allocation

Single allocation is the simplest memory management technique. It is a classical memory allocation model that assigns a process consecutive memory blocks. All the computer's memory, usually with the exception of a small portion reserved for the operating system, is available to the single application.

### B. Partitioned Memory Allocation

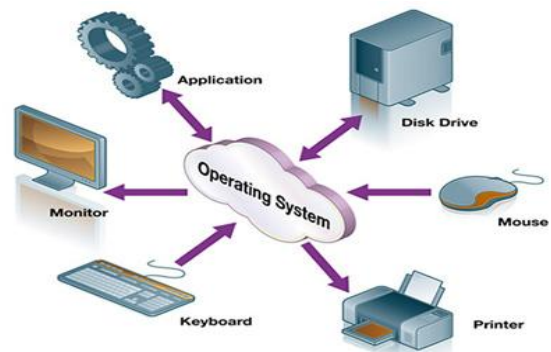
Partitioned allocation divides primary memory into multiple *memory partitions*, usually contiguous areas of memory. Each partition might contain all the information for a specific job or task.

### C. Paged Memory Allocation

Paged allocation divides the computer's primary memory into fixed-size units called *page frames*, and the program's virtual *address space* into *pages* of the same size. This type of allocation usually requires some hardware support to prevent the jobs from interfering with one another or with the operating system.

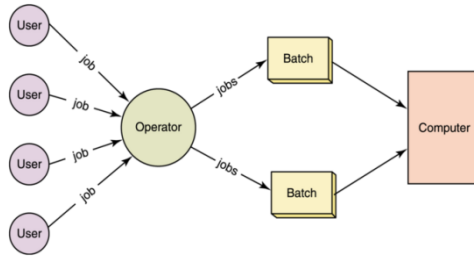
### D. Segmented Memory Allocation

Segmented memory is a system of addressing computer memory, which may be physical or virtual and may be operating in real or protected mode. It is the only memory management technique that does not provide the user's program with a linear and contiguous address space.



## VII. BATCH PROCESSING

Batch processing is the execution of a series of programs on a computer. Several programs are batched into single input tape. It increases the system performance. It is often used to perform various operations with digital images such as resize, convert, editing image files and so on. It is also used for converting computer files from one format to another.



## VIII. SERIAL PROCESSING

The serial processing operating systems are those which performs all the instructions in a sequence manner i.e. It follows FIFO mechanism (First In First Out), which means All the instruction those are entered first will be executed first and the instruction those are entered later will be executed later. For running the instruction, the program counter is used which is used for executing all the instructions.

## CONCLUSION

The Operating System is typical example to the advances and development of the modern computer, without it there would be no interaction between computer and operator today and the running of application programs, in a managed way.

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