**Operating System (OS)**

An **Operating System (OS)** is a collection of software that manages computer hardware resources and provides common services for computer programs.

An operating system acts as an interface between the software and different parts of the computer or the computer hardware.

It controls and monitors the execution of all other programs that reside in the computer, which also includes application programs and other system software of the computer.

Commonly Used OS: Windows, UNIX, LINUX, BOSS, SOLARIS

**Functions of OS**

**1. Memory Management:**

* An Operating system manages the allocation and deallocation of memory to various processes and ensures that the other process does not consume the memory allocated to one process.
* It allocates the memory to a process when the process requests and deallocates the memory when the process has terminated or is performing an I/O operation.

**2. Processor Management:**

* In a multi-programming environment, the OS decides the order in which the processes should access the processor, and how much time each process has, and this is also called **Process Scheduling**.

**3. Device Management:**

* An OS manages device communication via its respective drivers.
* It keeps track of all the connected devices, receives requests from these devices, performs a specific task, and communicates back.

**4. User Interface:**

* The user interacts with the computer system through the OS. Hence it also acts as an interface between the user and the computer hardware.
* This interface which is used by users to interact with the applications and machine hardware is offered through a set of commands or a GUI (Graphical User Interface).

**5. Security:**

* The Operating System uses password protection and other similar techniques to protect user data.
* It also prevents unauthorized access to programs and user data.

**6. Job Accounting:**

* The operating system Keeps track of time and resources used by various tasks and users and uses this information the OS decides the order of applications running and how much time should be allocated.

**A diagram of a operating system

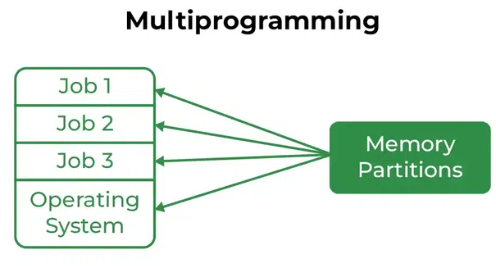
Description automatically generatedTypes of OS**

**1.Batch Operating System:**

This type of operating system does not interact with the computer directly.

There is an operator which takes similar jobs having the same requirement and groups them into batches.

It is the responsibility of the operator to sort jobs with similar needs.

**2. Multi-Programming OS**

Multiprogramming Operating Systems can be simply illustrated as more than one program is present in the main memory and any one of them can be kept in execution.

This is basically used for better execution of resources.

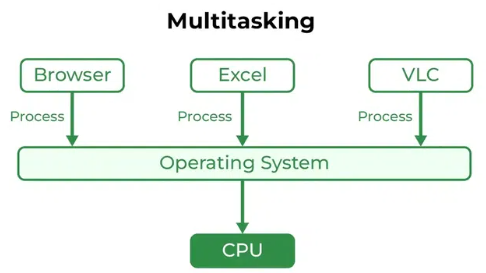
**A diagram of a computer

Description automatically generated**

**3. Multi-Processing OS**

Multi-Processing Operating System is a type of Operating System in which more than one CPU is used for the execution of resources.

It betters the throughput of the System.

**4. Multi-Tasking OS**

Multitasking Operating System is simply a multiprogramming Operating System with having facility of a Round-Robin Scheduling Algorithm.

It can run multiple programs simultaneously.

A diagram of a computer system

Description automatically generated**5. Time Sharing OS:**

It is the OS in which each task is given some time to execute so that all the tasks work smoothly.

The time that each task gets to be executed is called quantum. After this time interval is over OS switches over to the next task.

**A diagram of a computer network

Description automatically generated**

**6. Distributed OS:**

In this type of OS various autonomous interconnected computers communicate with each other using a shared network.

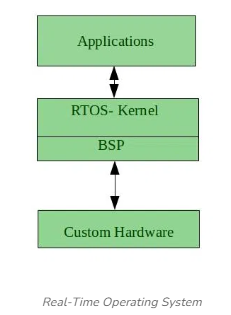
These are referred to as **loosely coupled systems**.

**A diagram of a computer network

Description automatically generated7. Networking OS:**

These systems run on a server and provide the capability to manage data, users, groups, security, applications, and other networking functions.

These are referred to as **tightly coupled systems**.

**8. Real-Time Operating System (RTOS):**

These types of OSs serve real-time systems. The time interval required to process and respond to inputs is very small.

Real-time systems are used when there are time requirements that are very strict like missile systems, air traffic control systems, robots, etc.

Types of RTOS: Hard RTOS, Soft RTOS

https://www.linkedin.com/pulse/50-commonly-asked-operating-system-interview-topic-wise-lokeswari/