# Operating System Interview Ques.

★ **What is an Operating system?**

➡ An Operating system is a program that acts as an intermediary between the user and computer hardware. The purpose of an OS is to provide a convenient environment in which user can execute programs in a convenient and efficient manner.

★ **What are the different operating systems?**

➡ 1. Batched operating systems.
2. Multi-programmed operating systems.
3. timesharing operating systems.
4. Distributed operating systems.
5. Real-time operating systems.



★ **What is dead lock?**

➡ Deadlock is a situation or condition where the two processes are waiting for each other to complete so that they can start. This result both the processes to hang.

★ **What is a process?**

➡ A program is execution is called a process.
Processes are two types:
1. Operating system processes.
2. User Processes.

★ **What are the states of a process?**

➡ 1. New
2. Running
3. Waiting
4. Ready
5. Terminated.

★ **What is semaphore?**

➡ Semaphore is a variable, whose status reports common resource, Semaphore is of two types one is Binary semaphore and other is Counting semaphore.

★ **What is a thread?**

➡ A thread is a program line under execution. Thread sometimes called a light-weight process, is a basic unit of CPU utilization; it comprises a thread id, a program counter, a register set, and a stack.



★ **What do you know about Interrupt?**

➡
- Interrupt can be understood as a signal from a device causing context switch.
- To handle the interrupts, interrupt handlers or service routines are required.
- The address of each Interrupt service routine is provided in a list which is maintained in Interrupt vector.

★ **What is context switching?**

➡
- Context is associated with each process encompassing all the information describing the current execution state of the process.
- When the OS saves the context of program that is currently running and restores the context of the next ready to run process, it is called as context switching.
- It is important for multitasking OS.

★ **What is a Critical section?**

➡ It is a section of code which can be executed only by one process at a time.

★ **Name the different types of memory ?**

➡ a). Main memory also called primary or RAM.
b). Secondary memory or backing storage.
c). Cache.
d). Internal process memory.

★ **What are Page frames?**

➡ Page frames are the fixed size contiguous areas into which the main memory is divided by the virtual memory.

★ **What are Pages?**

➡
- Pages are same sized piece of logical memory of a program. Usually they range from 4KB to 8KB depending on the addressing hardware of the machine.
- Pages improve the overall system performance and reduce requirement of physical storage as the data is read in page units.

★ **What is a compiler?**

➡ A compiler is a program that takes a source code as an input and converts it into an object code. During the compilation process the source code goes through lexical analysis, parsing and intermediate code generation which is then optimized to give final output as an object code.

★ **What is a library?**

➡ It is a file which contains object code for subroutines and data to be used by the other program.

★ **What is a socket?**

➡ A socket is used to make connection between two applications. End points of the connection are called socket.

★ **What is DLM?**

➡
- It is the service called as distributed lock manger.
- In cluster systems to avoid file sharing the distributed systems must provide the access control and file locking.
- This ensures that no conflicting operations occur in the system.
- Here the distributed file systems are not general purpose therefore it requires locking.

★ **What is a real-time system?**

➡ Real-time system is used in the case when rigid-time requirements have been placed on the operation of a processor. It contains a well defined and fixed time constraint.



★ **What is Kernal?**

➡ Kernal is the core and most important part of a computer operating system which provides basic services for all parts of the OS.

★ **What are the different states of a Process?**

➡ A list of different states of process:

- New process – The Process is being created.
- Running – In this state the instructions are being executed.
- Waiting – The process is in waiting state until an event occurs like I/O operation completion or receiving a signal.
- Ready – The process is waiting to be assigned to a processor.
- Terminated – the process has finished execution.

★ **What is an Idle thread?**

➡ The special thread a dispatcher will execute when no ready thread is found.

★ **What is the difference between Process and Program?**

➡

| PROCESS | PROGRAM. |
|---|---|
| • A process is an executing instance of a program. | • A program is a system activity that uses a set of instructions to perform a designated task. |
| • In other words, the process is a program in execution. | • It is considered a passive entity as it resides on secondary memory. |
| • A process is entirely dependent on the program. | • The resource requirement is less as it only requires memory for storage. |

★ **What is virtual memory?**

➡ Virtual Memory is a very useful memory management technique which enables processes to execute outside of memory. This technique is espacially used when an executing program cannot fit in the physical memory.

★ **What is thrashing?**

➡ Trashing is a phenomenon in virtual memory scheme when the processor spends most of its time in swapping pages, rather than executing instructions.

★ **What is a thread?**

➡ A thread is a basic unit of CPU utilization. It consists of a thread ID, program counter, register set and a stac.

★ **What is fragmentation?**

➡ Fragmentation is a phenomenon of memory wastage. It reduces the capicity and performance because space is used inefficiently.

★ **What is thrashing?**

➡ It is a phenomenon in virtual memory schemes when the processor spends most of its time swapping pages, rather than executing instructions. This is due to an inordinate number of pages faults.

★ **What is cache memory?**

➡ Cache memory is random access memory (RAM) that a computer microprocessor can access more quickly than it can access regular RAM. As the microprocessor processes data, it looks first in the cache memory and if it finds the data there (from a previous reading of data), it does not have to do the more time-consuming reading of data from larger memory.



★ **What is logical and physical addresses space?**

➡ Logical addresses :- Logical address space is generated from CPU; it bound to a separate physical address space is central to proper memory management.

Physical addresses :- Physical address space is seen by the memory unit. Logical address space is virtual address space. Both these address space will be same at compile time but differ at execution time.

★ **Differentiate between compiler and interpreter?**

➡ Interpreter :- An interpreter reads one instruction at a time and carries out the actions implied by that instruction. It does not perform any translation.

Compiler :- A compiler translates the entire instructions.

★ **What is a Real-Time System?**

➡ A real time process is a process that must respond to the events within a certain time period. A real time operating system is an operating system that can run real time processes sucessfully.

★ **What is Marshalling?**

➡ The process of packaging and sending interface method parameters across thread or process boundaries.

★ **What is busy waiting?**

➡ The repeated execution of a loop of code while waiting for an event to occur is called busy-waiting. The CPU is not engaged in any real productive activity during this period, and the process does not progress towards completion.

★ **What is dual-mode operation?**

➡ In Order to protect the operating systems and the system programs from the malfunctioning programs the two mode operations were evolved system mode user mode.

★ **What is DRAM?**

➡ DRAM ( Dynamic RAM ) stores the data in the form of capacitance, and static RAM stores the data in Voltages.

★ **What are the sub-components of I/O manager in Windows NT?**

➡ 1). Network redirector / server.
2). Cache manager.
3). File Systems.
4). Network driver
5). Device Driver.

★ **What is starvation in Operating System?**

➡ Starvation is Resource management problem. In this problem, a waiting process does not get the resources it needs for a long time because the resources are being allocated to other processes

★ **What are aging in Operating System?**

➡ Aging is a technique used to avoid the starvation in resource scheduling system.

★ **What are overlays?**

➡ Overlays makes a process to be larger than the amount of memory allocated to it. It ensure that only important instructions and data at any given time are kept in memory.



★ **What is a real-time system?**

➡ Real-time system is used in the case when rigid-time requirements have been placed on the operation of a processor. It contains a well defined and fixed time constraints.

★ **What is a drawback of MVT?**

➡ 1). ability to support multiple processors
2). Virtual Storage.
3). source level debugging.

★ **What is relative path and absolute path?**

➡ Absolute path :- Exact path from root directory.

Relative path :- Relative to the current path.

★ **What is a data register and address register?**

➡ Data registers :- Data registers can be assigned to a variety of functions by the programmer. They can be used with any machine instruction that performs operations on data.
address registers :- address registers contain main memory addresses of data and instructions or they contain a portion of the address that is used in the calculation of the complete addresses.

★ **What are the disadvantages of context switching?**

➡ Time taken for switching from one process to other is pure over head. Because the system does no useful work while switching. so one of the solutions is to go for threading whenever possible.

★ **What are different type of Real-time Scheduling?**

➡ Hard real-time systems required to complete a critical task within a guranteed amount of time. Soft real-time computing requires that critical processes receive priority over less fortunate ones.

★ **What is a device queue?**

➡ A list of processes waiting for a particular I/O device is called device queue.

★ **What is process migration?**

➡ It is the transfer of sufficient amount of the state of process from one machine to the target machine.

★ **What are residence monitors?**

➡ Early operating systems were called residence monitors.

★ **Define compactions.**

➡ Compactions is a process in which the free space is collected in a large memory chunk to make some space available for processes.

★ **What is SMP?**

➡ To achieve maximum efficiency and reliability a mode of operation known as symmetric multiprocessing is used. In essence, with SMP any process or threads can be assigned to any processor.



★ **What is a daemon?**

➡ Daemon is a program that runs in the background without users interaction. A daemon runs in a multitasking operating system like UNIX. A daemon is initiated and controlled by special programs known as Processes.

★ **What is the meaning of mutex?**

➡ Mutex is a short form for (Mutual Exclusion object). A mutex allows multiple threads for sharing the same source. The resource can be file. A mutex with a unique name is created at the time of starting a program. A mutex must be locked from other threads, when any thread that needs the resource. When the data is no longer used/needed the mutex is set to unlock.