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What is Context switching?

Ans:- A context switching is a process that involves switching of the CPU from one process or task to another. In this phenomenon, the execution of the process that is present in the running state is suspended by the kernel and another process that is present in the ready state is executed by the CPU.

"Factor(s) Causes Context switch"

① Processor speed:-
Slower processors will generally take more time to perform context switches. Faster processors can handle the task more quickly.

② Number of processes:-
As the number of processes running on a system increases, the frequency of context switches also increases. More processes mean more state information to save and restore, leading to longer context switch times.

③ Process state size:-
The large the amount of data that needs to be saved and restored for each process during a context switch, the longer it will take. For example Processes with large memory footprints

or extensive register usage will experience longer context times.

4 I/O operations:-

If a process is waiting for an I/O operation to complete (such as reading from or writing to a disk), the context switch may take longer. This is because the operating system may need to handle the completion of the I/O operation before switching to another process.

5 Caches and TLBs:-

Modern processors use caches and Translation lookaside Buffers (TLBs) to speed up memory access. Context switches may incur additional overhead if the new process does not utilize

) Interrupt handling:-

Context switches often involve interrupt handling. If there are frequent interrupt or if the interrupt handling code is complex.

) Scheduling Policies:-

The scheduling policy of the operating system can also impact context switch times. For example, a more complex scheduling algorithm may require additional computation during a context switch, leading to longer durations.