Paper Name : Operating System

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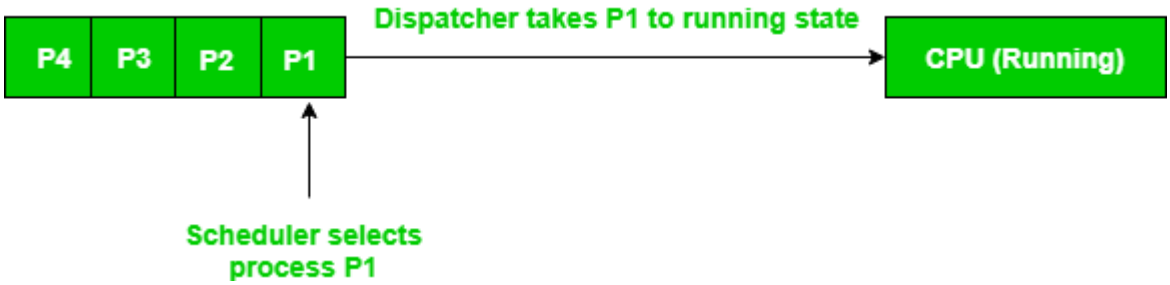
Dispatcher :

Dispatcher module gives control of the CPU to the process selected by the short-term scheduler; this involves:

- switching context
- switching to user mode
- jumping to the proper location in the user program to restart that program

Dispatch latency – time it takes for the dispatcher to stop one process and start another running

The procedure of selecting a process among various processes is done by the scheduler. Once the scheduler has selected a process from the queue, the dispatcher comes into the picture, and it is the dispatcher who takes that process from the ready queue and moves it into the running state. Therefore, the scheduler gives the dispatcher an ordered list of processes which the dispatcher moves to the CPU over time.



CPU scheduling decisions may take place under the following conditions:

1. When a process switches from **running** state to the **waiting** state (for I/O)
2. When a process switches from **running** state to the **ready** state (for example, when an interrupt occurs)
3. When a process switches from **waiting** state to the **ready** state (for example, at completion of I/O)
4. When a process terminates

When scheduling takes place under situations 1 and 4 we say that the scheduling is non pre-emptive otherwise in situations 2 and 3 it is pre-emptive.

Based on whether a process releases CPU voluntarily or the CPU is forcefully taken away after a fixed amount of time there are 2 categories of scheduling:

1. Pre-emptive scheduling
2. Non pre-emptive scheduling

Pre-emptive scheduling :

A running process may not be allowed to utilize it's entire CPU burst time and instead may be forced to go to ready state due to external factors.

Non pre-emptive scheduling:

Entire CPU burst of a running process is utilized before the process either terminates (finishes execution) or requests for some I/O operation . It is also called co-operative scheduling because the CPU burst of a process is not disturbed by any external factors.

Various times related to a process

- **Arrival time**
  The time at which the process enters into the ready queue is called the arrival time.

- **Burst time**
  Burst time is the amount of time required by a process for executing on CPU. It is also called as **execution time** or **running time**.

- **Completion time**
  Time at which process completes its execution.

- **Waiting time**
  Waiting time is the amount of time spent by a process waiting in the ready queue for getting the CPU.

  Waiting time = Turnaround time - Burst time

- **Turnaround time**
  The total amount of time spent by the process from its arrival to its completion, is called turnaround time.

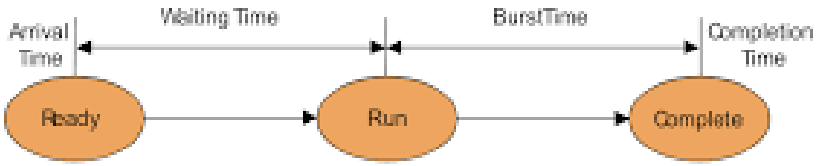
  Turnaround time = Burst time + Waiting time

  Turnaround time = Completion time – Arrival time = Waiting time + Burst time

- **Response time**

  Response time is the time spent when the process is in the ready state and gets the CPU for the first time.

  Response time = Time at which the process gets the CPU for the 1st time – Arrival time



CT -AT =WT +BT

TAT =CT -AT

Waiting Time = TAT -BT

TAT ⟶ Turn around time

BT ⟶ Burst time

AT ⟶ Arrival time
