OPERATING SYSTEMS (THEORY)

LECTURE - 5

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CPU SCHEDULING

WHY SCHEDULING?

=> Efficient utilization of processor

SCHEDULERS - TYPES

(1) Long Term Scheduler [Job Scheduler]

- Selects job from **Pool of Jobs** and load this jobs into **Main Memory** (**Ready Queue**) of the computer

(2) Short Term Scheduler [CPU Scheduler]

- Selects a job from **Ready Queue** and gives the control of **CPU** to that process with the help of **Dispatcher**

- Method of **selecting a process from Ready Queue** depends on **CPU scheduling algorithm**

(3) Medium Term Scheduling:

- It **keeps** the required processes in Main Memory and remove the process that are not needed { waiting for an I/O event}

- i.e. If a process request an I/O in the middle of execution then the process removed from Main Memory and Loaded into Waiting Queue

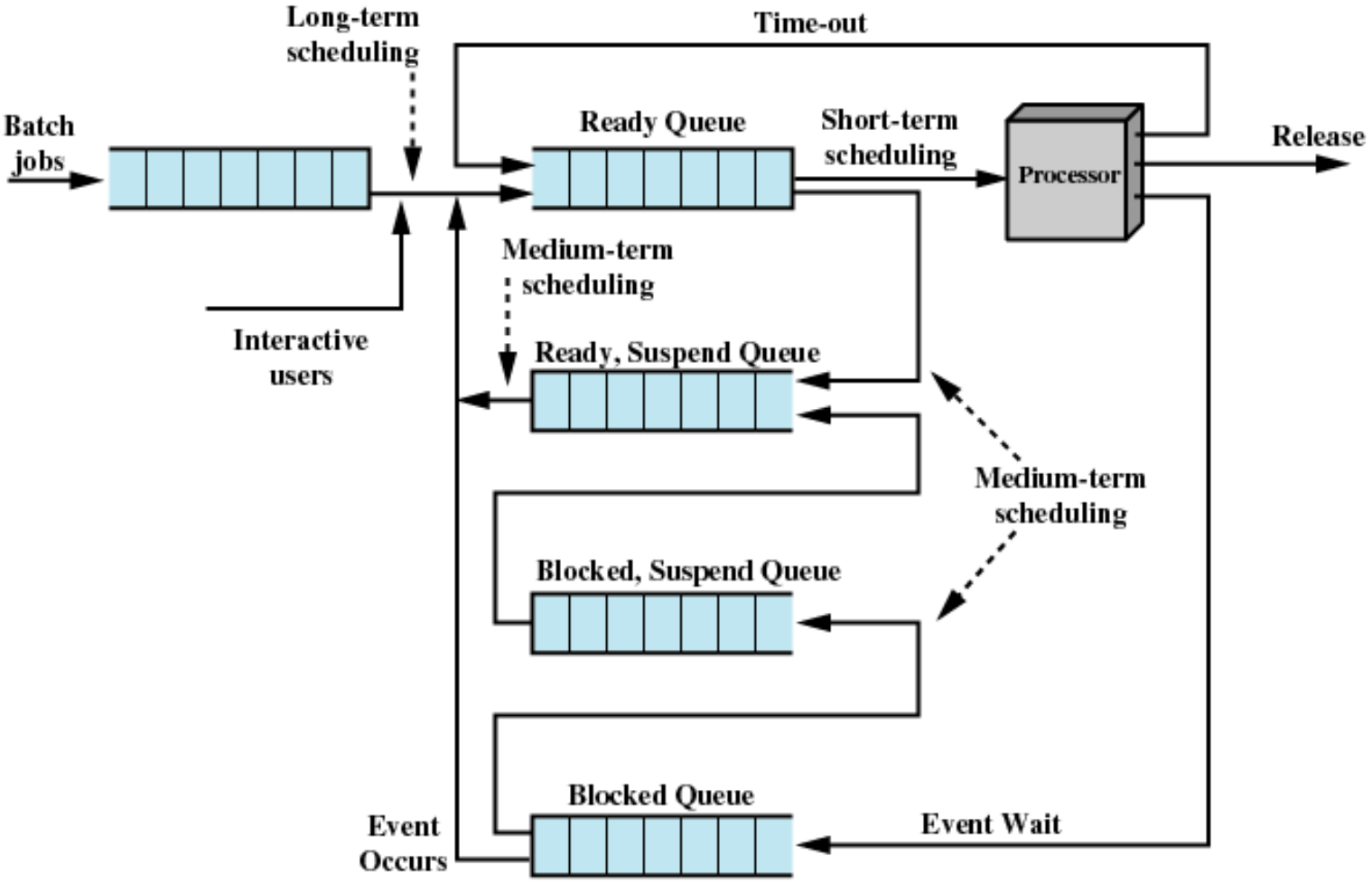

Figure 9.3 Queuing Diagram for Scheduling

Dispatcher

- It is a module which connects the CPU to the process selected by the short term scheduler

Main Function:

- Switching the CPU from one process to another

Dispatch Latency:

- The time takes by the dispatcher to stop one process and start another running

Scheduling Criteria

(1) Throughput:

- Number of jobs completed by the CPU within a time period

(2) Turn Around Time:

- The time interval between the submission of the process and time of completion

Turn around Time = **Time to get into Memory**

+

Waiting time in ready queue

+

Executing time in CPU

+

Wait time in waiting queue for I/O

(3) Waiting Time :

- **Sum of the periods** spent **waiting** by a process in the **Ready Queue**

(4) Response Time:

- The time duration between the submission of job and first response

(5) CPU Utilization:

- Percentage of time the processor is Busy.

SCHEDULING ALGORITHMS

- It decides which of the processes in ready queue is to be allocated to the CPU

- The algorithm which maximizes

  => CPU Utilization

  => Throughput

- Minimizes

  => Turn around time

  => Waiting Time

  => Response Time