

Multilevel Feedback Queue Scheduling

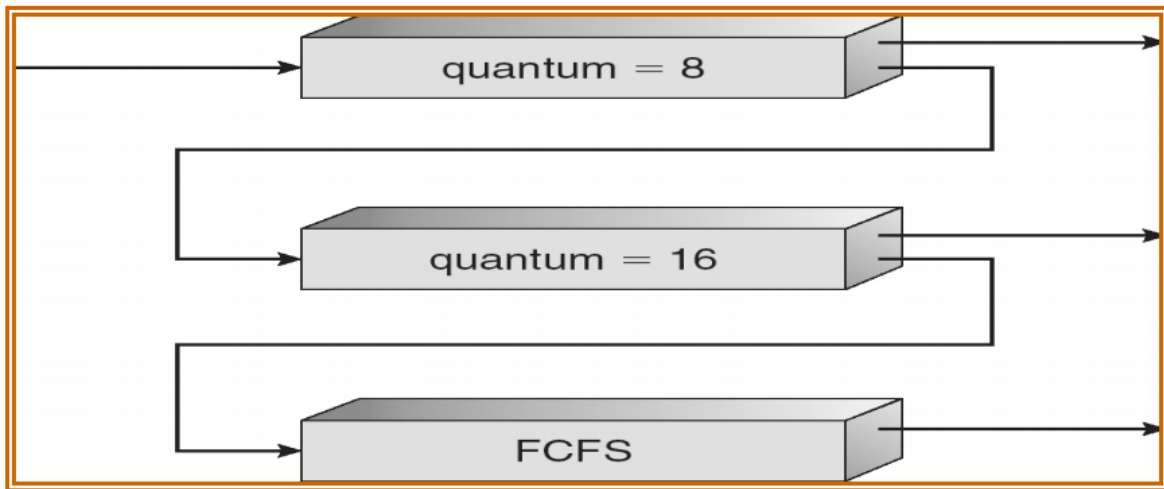
In the multilevel queue-scheduling algorithm, the processes are permanently assigned to the system entry queue. Processes do not move between queues. This setup has the advantage of lower scheduling overhead, but the lack of consistency.

Multilevel Feedback queue scheduling, however, allows the process to move between queues. The idea is to split processes with different CPU-burst features. If the process consumes too much CPU time, it will be moved to a much lower line. Similarly, the longest waiting process in the lowest line can be delivered to the most important line. This form of aging prevents starvation.

- Allows processes to move between queues
- Inter-queue scheduling: preemptive priority scheduling
- A process waiting too long in a low-priority queue may be moved to a high-priority queue.

Example:

consider a multilevel feedback queue scheduler with three queues, numbered from 0 to 2. The scheduler first executes all processes in queue 0. Only when queue 0 is empty will it execute processes in queue 1. Similarly, processes in queue 2 will be executed only if queues 0 and 1 are empty. A process that arrives for queue 1 will preempt a process in queue 2. A process that arrives for queue 0 will, in turn, preempt a process in queue 1.



User Problems(MFQS):

Problem 1:

Consider a system which has a CPU bound process, which requires the burst time of 40 seconds. The multilevel Feedback Queue scheduling algorithm is used and the queue time quantum '2' seconds and in each level it is incremented by '5' seconds. Then how many times the process will be interrupted and on which queue the process will terminate the execution?

(a) 5,4 (b) 4,5 (c) 3,4 (d) 4,3

Solution:

Process P needs 40 Seconds for total execution.

Multilevel Feedback queue:

Queue 1 = 2

Queue2 = 7 (2+5)

Queue3 = 12 (7+5)

Queue4 = 17 (12+5)

Queue5 = 2 (left time)

hence you can see process is interrupted 4 times, and on 5th queue process completed its execution.

Hence, (b) is correct option

Interview Questions

1. Explain Multilevel Feedback Queue Scheduling. (GS)

Please refer to the notes for definitions of the aforementioned operating systems under the heading “**Multilevel Feedback Queues scheduling**”.

2. Which of the following parameters are required to define a multilevel feedback queue scheduler? (Myntra)

In general, a multilevel feedback queue scheduler is defined by the following parameters: The number of queues. The scheduling algorithm for each queue which can be different from FIFO. The method used to determine when to promote a process to a higher priority queue.

3.What is the difference between multilevel queue and multilevel feedback queue?(Adobe)

Multilevel Queue	Multilevel feedback Queue
In the Multilevel queue (MLQ) processes are classified into different groups. For example, common division is made between foreground (interactive) processes and background (batch) processes which have different response time and scheduling needs.	In the Multilevel Feedback queue (MLFQ), it contains two queues, lower-priority queues and higher priority queues. In this the separation of processes are done according to the characteristics of their CPU bursts.
In the Multilevel queue (MLQ) the foreground queue might be scheduled by Round Robin algorithm while the background queue is scheduled by First Come First Serve algorithm. There is the possibility of starvation.	Multilevel Feedback queue (MLFQ) if a process uses too much CPU time it will be moved to a lower-priority queue
In the Multilevel queue (MLQ) the processes are permanently assigned to one queue based on their memory size, process priority or process type.	In the Multilevel Feedback queue (MLFQ) it allows a process to move between the queues, according to the characteristics of their CPU burst.