

CIS 452 - Operating Systems Concepts

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Images taken from Silberschatz book

Scheduling Algorithms -- Multilevel Feedback Queue

Processes in a multilevel queue scheduling system are assigned to a particular queue and never moved

Multilevel feedback queue scheduling moves processes between queues automatically

Goal of multilevel feedback queue is slightly different than previous multilevel queues

Rather than assigning processes to queues based on some external consideration, process behavior (measured as CPU burst time) is used to determine how to categorize a process

Scheduling algorithm will adapt if behavior of process changes over time

General idea: processes that have longer CPU bursts will be moved to lower-priority queues

Processes that stay in the higher-priority queues are

- I/O bound, and/or
- interactive with user

I/O bound processes can more effectively share the CPU than CPU-bound ones

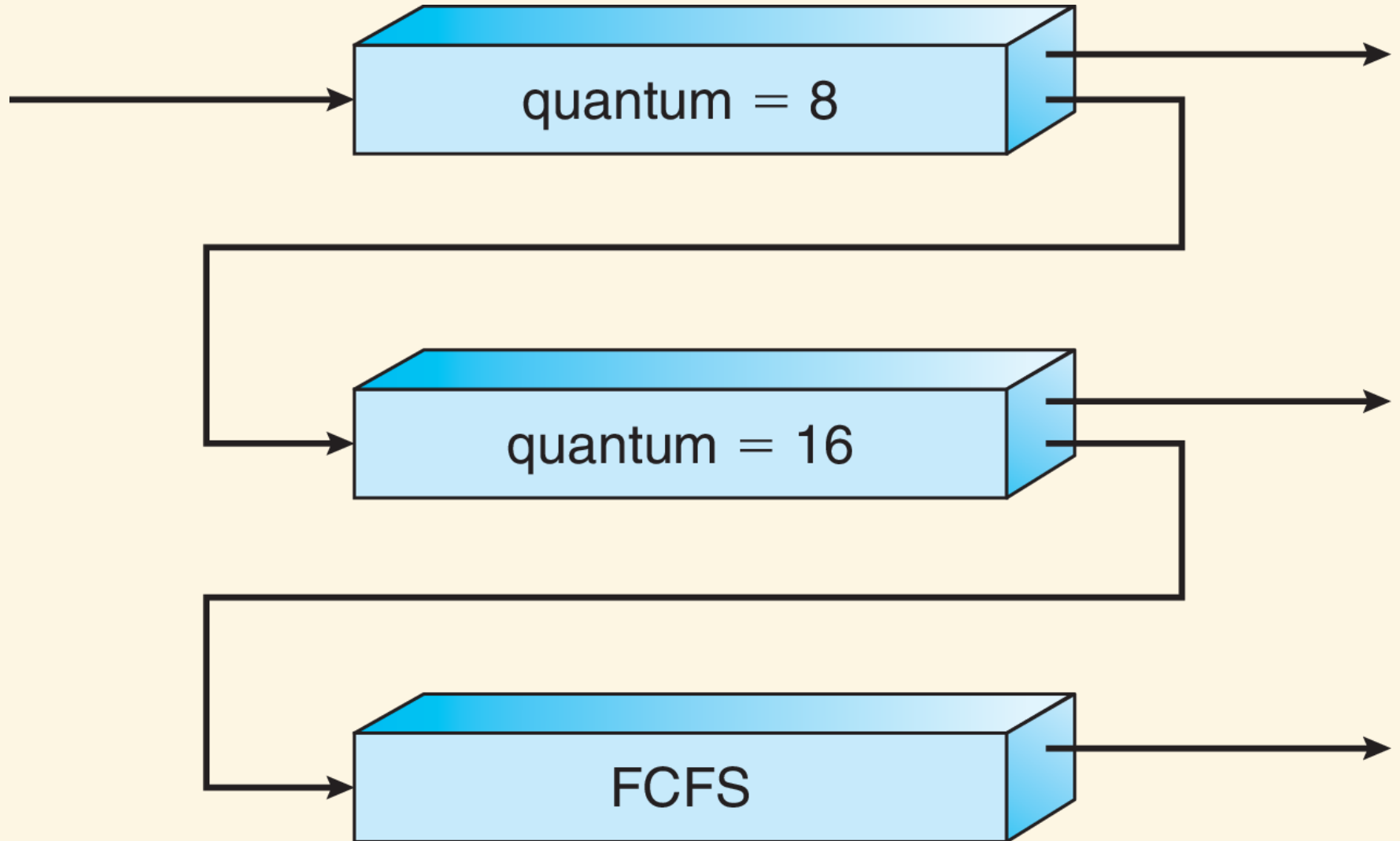
Foreground processes, which tend to have short bursts because they wait for user interaction, will maintain a low response time

Typically assume that higher-priority queues are always run before lower-priority and that algorithm is preemptive

With any priority-based algorithm, starvation can be an issue

As always, we solve this using aging

Processes can be moved up to higher-priority queues if they have been waiting for a long time



Multilevel feedback queue is a very general and flexible algorithm

This means that there are a *lot* of parameters that can be tuned

Just as with regular multilevel queues, we can choose:

- number of queues
- scheduling algorithm within each queue

Additionally, other parameters that can be modified are:

- where to put new processes
- when to promote a process to a higher-priority queue
- when to demote a process to a lower-priority queue

