- Jobs can be moved between the queues.

  Priorities

- Maintain multiple queues of ready processes, each with different

  What is multi-level feedback queue scheduling?

  It is a multi-level feedback queue based algorithm

BSD 4.4 Scheduling Algorithm
How do you move processes between queues or change priority?

How many queues (priority levels)?

Algorithm

Specifying a Multi-level Feedback Queue Based
Adjust the priority every 4 clock ticks or 40 milliseconds

Select a new process to run from the queue with the lowest priority

Round robin scheduling within a queue, time quantum of 0.1 sec

Priority level can be between 0 and 127. Divide by 4 and have 32
If \( p_{\text{usr}} \) comes out higher than 127, adjust to 127

If \( p_{\text{usr}} \) comes out lower than 50, adjust to 50

\( p_{\text{nice}} \) is set by the user and is between -20 and 20

\( p_{\text{estcpn}} \) is the estimated and weighted CPU utilization

\[
p_{\text{usr}} = 50 + \left( p_{\text{estcpn}} / 4 \right) + 2 \times p_{\text{nice}}
\]

Adjust priorities using the equation

Only handle user processes - Priority levels between 50 and 127

Priority levels 0 to 49 are reserved for kernel processes - we will

More on Priority Levels
previous 1 minute interval of the system operation

\[ \text{load} = \text{the sampled average of the length of run queues over the} \]

\[ \frac{2 \times \text{load} + 1}{2 \times \text{load}} = \text{p-estcpu + p-quc} \]

The equation to be used is

After every 1 second, decay the CPU usage

Every clock tick, add one to p-estcpu for the process that is running

The factor p-estcpu, used for adjusting priorities

Accumulated CPU time
If load is $L$, only 15% of the time remains after 5 decay computer.
Use the load values when it awakes

$p_{sleep} = \text{time it was asleep} \text{ in seconds}$

$\frac{2 \times p_{estcpu}}{2 \times \text{load}_{p-sleep}} = \text{load}_{p-sleep}$

If sleeping greater than 1 second, use the equation

Long it was sleeping

Use time of last dispatch and length of last cpu burst to tell how

If sleeping less than 1 second, use old values of $p_{estcpu}$

Processes that are not running or in run queue