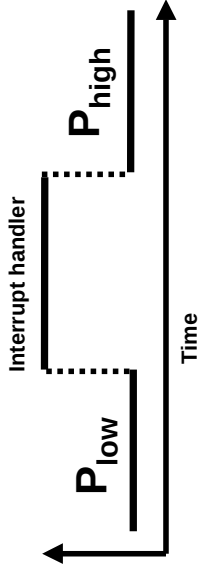


Chapter 7: Processor Scheduling Strategies

(1) Priority - Pre-emption

used in Simple Kernel

- Each process is assigned a priority.
- A process runs until it suspends itself or it is interrupted.
- If the interrupt makes a higher priority process ready the high priority process will be run.
 - i.e. the lower priority process is *pre-empted*



7 - Scheduling

1

Example: Interrupt Latency with Natural Break.

- Ready-Queue State:
 - P1, P2
- Clock Interrupt at time T puts P3 on readyQ.
- Ready-Queue State:
 - P1, P2, P3
- P1 then runs for 2 milliseconds before suspending itself.
- P2 runs for 3 milliseconds before suspending itself.
- Thus the latency between the clock interrupt occurring and P3 being run on the processor is **5** milliseconds.

Advantages:

- Simple to implement
- Efficient implementation of mutual exclusion
- Response time depends on run-times of user programs.

Disadvantages:

- Assumes well-behaved user processes.
 - no Loops without breaks (delay/P)
 - short time between breaks
- Response time depends on run-times of user programs.

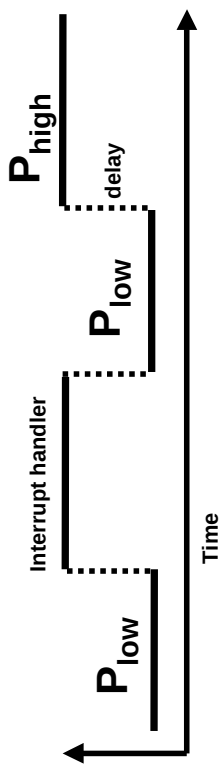
7 - Scheduling

3

(2) Run-to-completion Scheduling

(Natural Break)

- Process runs until it suspends itself.
- The same process must run after an interrupt has occurred as was running before.

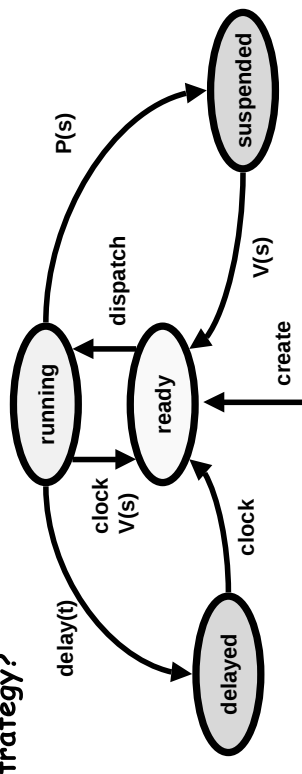


7 - Scheduling

2

Exercise:

What transition in the Simple Kernel must be disallowed if it is to be modified to a Natural Break Scheduling Strategy?



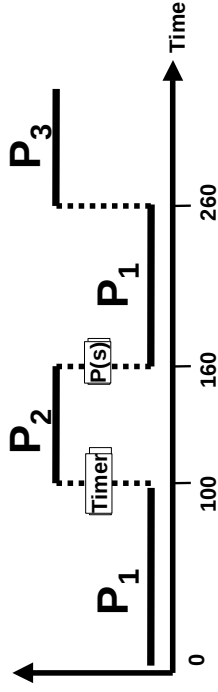
Which Kernel procedures must be modified and how?

7 - Scheduling

4

(3) Time Sliced Scheduling

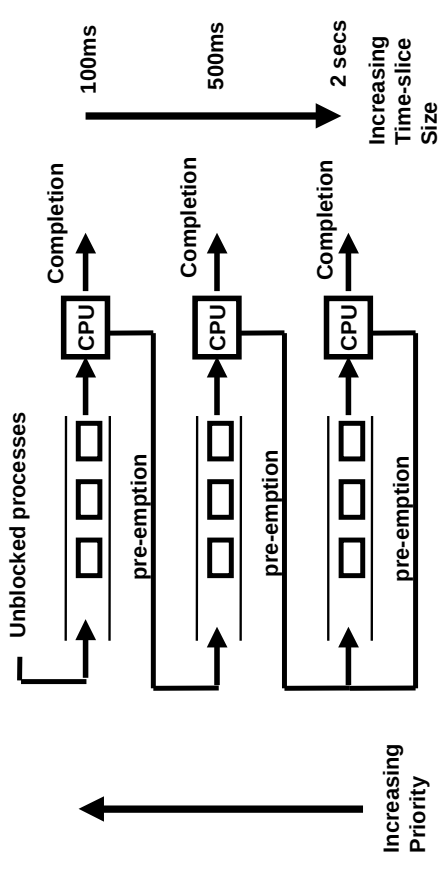
- Each process is run until its time slice expires or until it suspends itself.
- Used in time sharing systems to share processor among multiple users.



Large real-time systems can use a mixture of Time-sliced and priority pre-emption.

- e.g. VAX/VMS
 - High-priority real-time processes are scheduled by priority pre-emption.
 - Processes with priorities < 16 scheduled by time-slicing.

(4) Multi-Level Queues - Dynamic Priority Assignment



- Favours interactive jobs - they get a good response time.