PROCESS MANAGEMENT - The Process Lifecycle

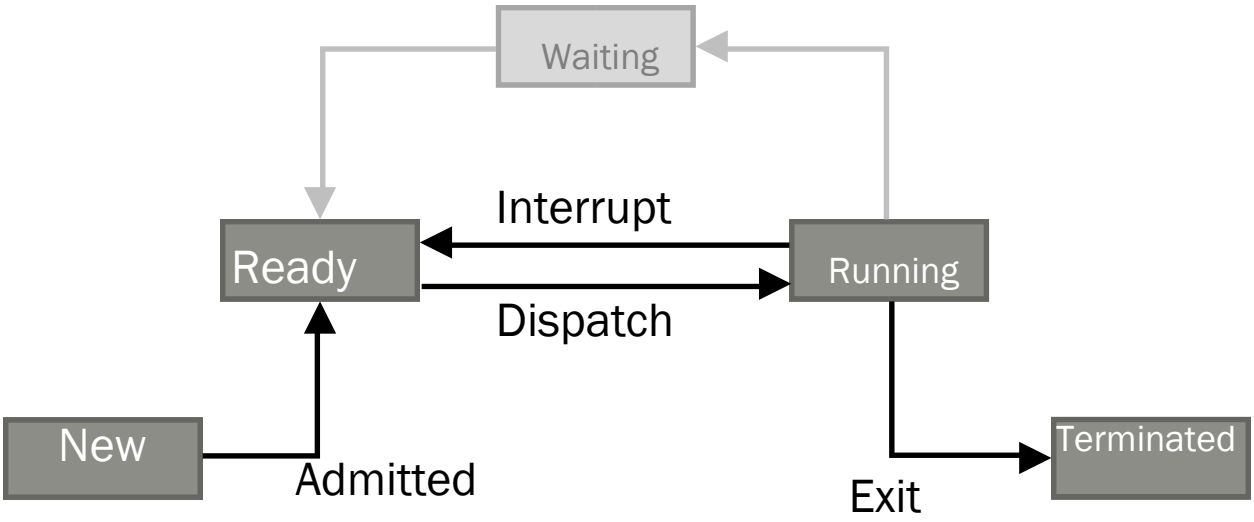
The Process:

■ An instance of a computer program execution

■ Machine code for process must reside in memory. – May also require memory allocation for data

■ Requires CPU cycles – computer power – OS manages this resource

Process States



Process States

■ New

– Being created

– No resources yet allocated

■ Ready

– All resources are allocated

– No more barriers to execution

– No longer waiting for any events or data

– Waiting for chance to use the CPU

■ Running

– Currently being executed

– Instructions being processed in the fetch-execute cycle

■ Terminated

– Completed execution

– No need to maintain data regarding process

■ Running – Currently being executed – Instructions being processed in the fetch-execute cycle

■ Waiting – For resources (other than CPU) – For memory page – For process to send signal – For Input / Output

■ Ready – Waiting for dispatch to CPU

CPU scheduling

■ Only processes in ready state can be moved to running state.

■ Turnaround time – Time between

■ when process enters ready state, and when it exits running state for the last time

■ Scheduling approaches

– First Come, First Served

– Shortest Job Next

– Round Robin

First Come, First Served (FCFS)

■ Moved to CPU – in the order in which the jobs arrive in the ready state

■ Non-preemptive

Process	Service time
p1	120
p2	80
p3	100
p4	30
p5	160

Shortest Job Next (SJN)

■ Looks at already processes – Selects shortest, runs it

■ Moves job to CPU

■ Completes job

■ Non-preemptive

FCFS	
Process	Service time
p1	120
p2	80
p3	100
p4	30
p5	160

SJN	
Process	Service time
p4	30
p2	80
p3	100
p1	120
p5	160

Round Robin

■ Time Slice (Quantum) – Suppose Time slice is 20

■ Preemptive

■ Widely used

Process	Service time
p1	120
p2	80
p3	100
p4	30
p5	160