

CS & IT ENGINEERING



Operating System

Process Management

Lecture -3



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Recap of Previous Lecture



Topic

Dual Mode of Operation

Topic

Process

Topic

Process Representation

Topic

Process Control Block

Topics to be Covered



Topic

Process states

Topic

Process State Transition

Topic

Process Scheduling

Topic

Types of Schedulers

Context switch is done by dispatch



Topic : Process States

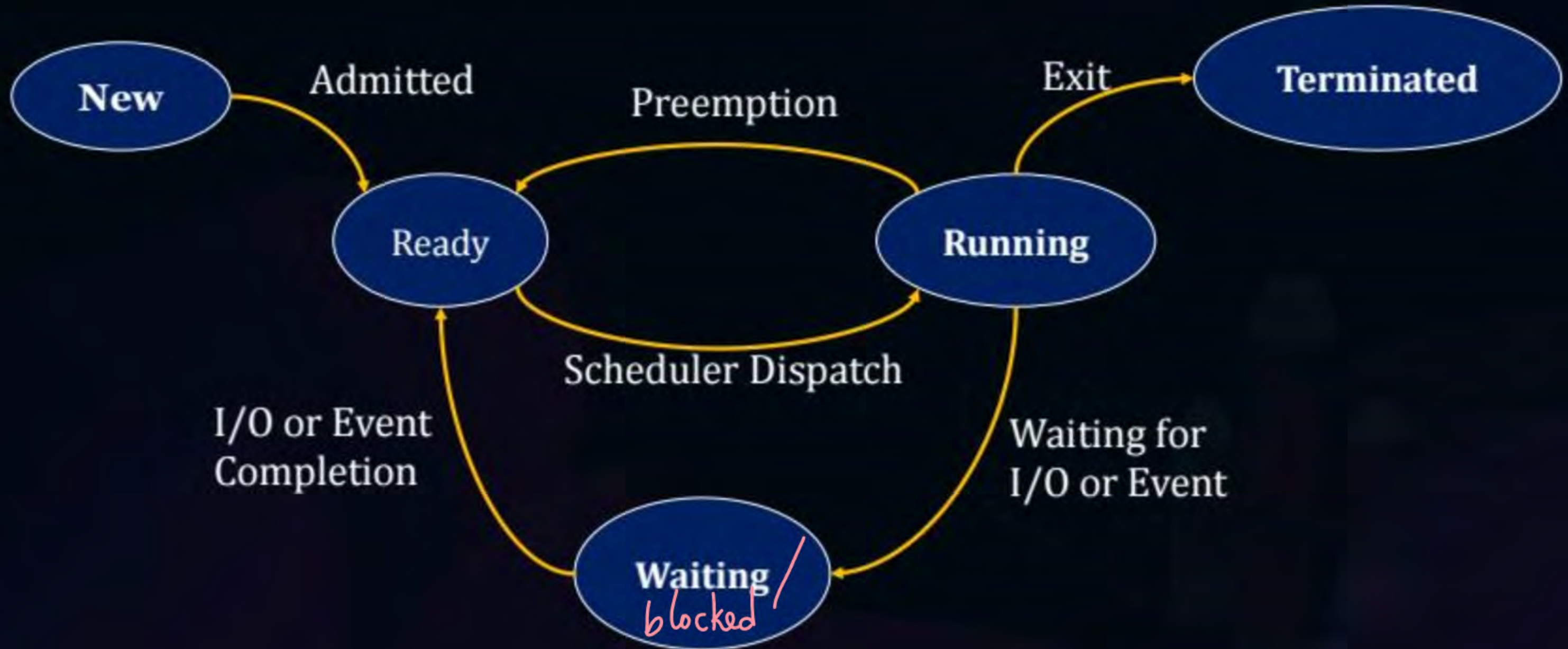


current activity the process is performing.



Topic : Process States

(Preemptive)





Topic : Process States

Process in m.m.

New:- All installed processes are known to be in new state *[Process is not in main memory]*

Ready:- All processes which are waiting to run on CPU are known to be in ready state

Running:- A process which is running on CPU has its state as running

Terminated:- A completed process has its state as terminated \Rightarrow *Process not in main memory*

Blocked:- All processes which are waiting for any I/O or event



Topic : Process States

New To Ready: When process is admitted by OS \Rightarrow *Memory & resources allocation*

Ready to Running: When a process is dispatched to CPU

Running to Terminated: When a process is completed \Rightarrow *Memory & resources deallocated*

Running to Blocked: When a process goes for IO or event

Running to Ready: When a process is preempted

Blocked to Ready: When a process completes IO or event



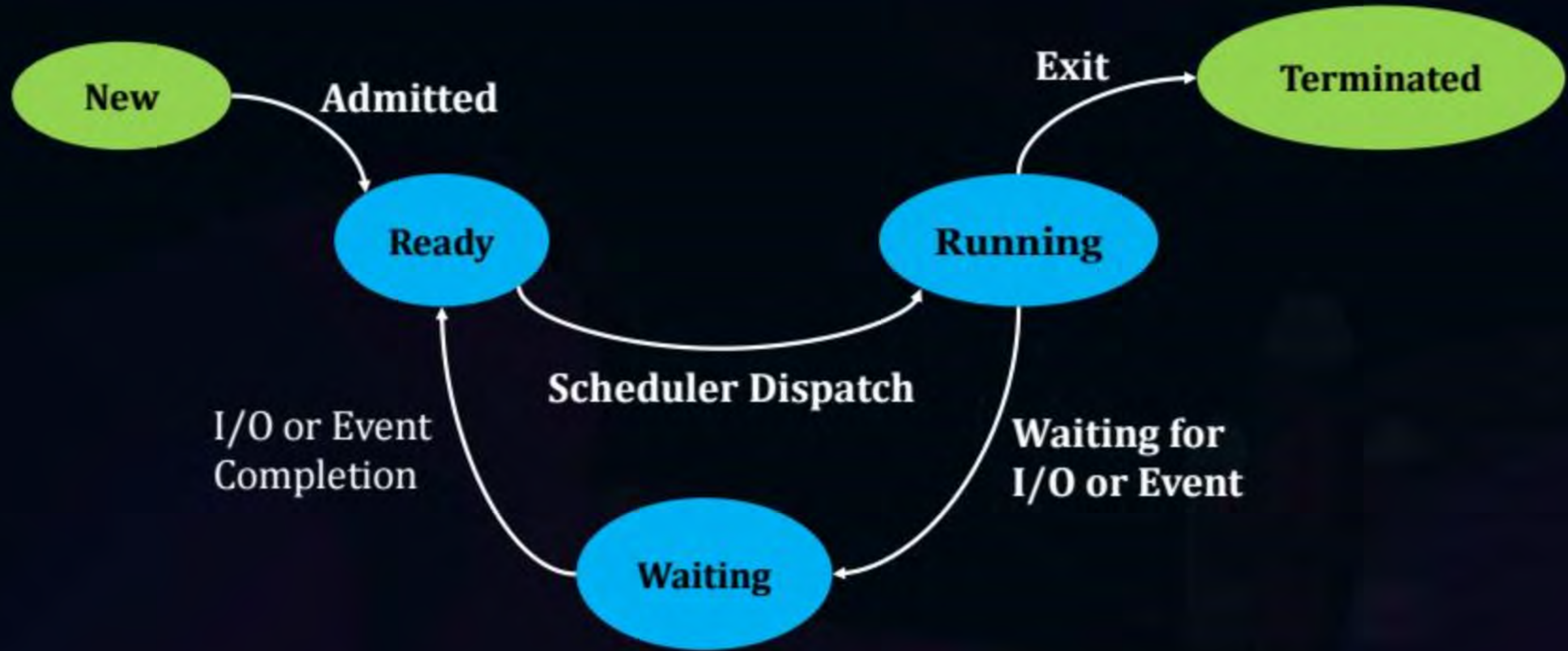
Topic : Process States



- ❑ 2 Transitions are voluntary: *(process can take)*
 - Running to Terminated
 - Running to Blocked



Topic : Non-preemptive Process States





Topic : CPU vs IO Bound Process



CPU Bound: If the process is intensive in terms of CPU operations

IO Bound: If the process is intensive in terms of IO operations



Topic : Process Scheduling



↳ needed when one process is to be selected among multiple.

Needed Because?



reason \Rightarrow to have efficiency (better performance)



Topic : Scheduling Queues

- Job Queue → all processes which are in New state, are kept in this
- Ready Queue → — || ————— Ready ————— || —
- Device Queue → — || ————— " ————— waiting for a device are kept in it's device Queue.



Topic : Types of Schedulers

← Programs of OS

- Long-Term Scheduler (Job)
- Short-Term Scheduler (CPU)
- Mid-Term Scheduler (Medium-term)

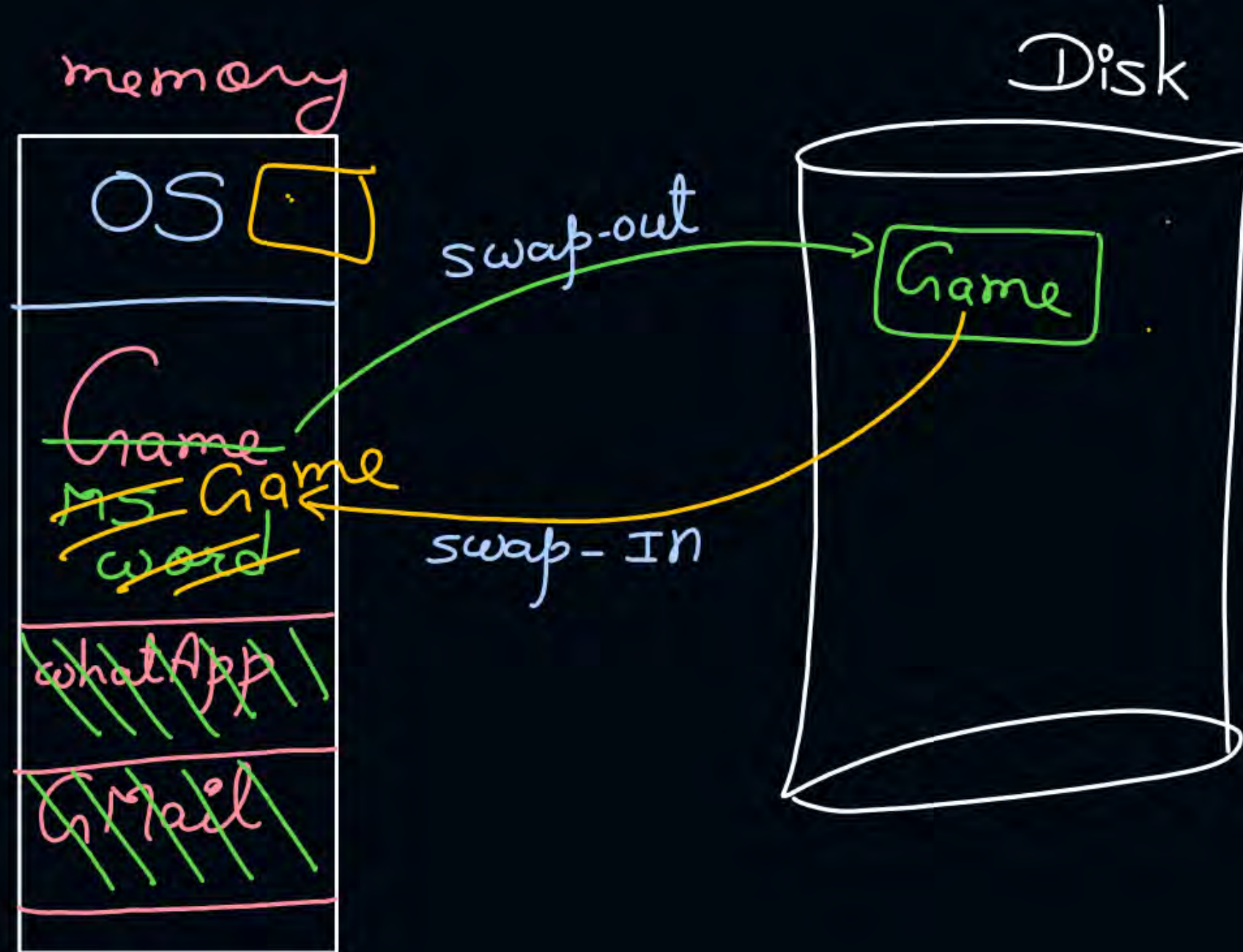
→ brings a process from new state to ready state

→ selects one of the ready processes to run on CPU.

↳ It performs swapping of processes.

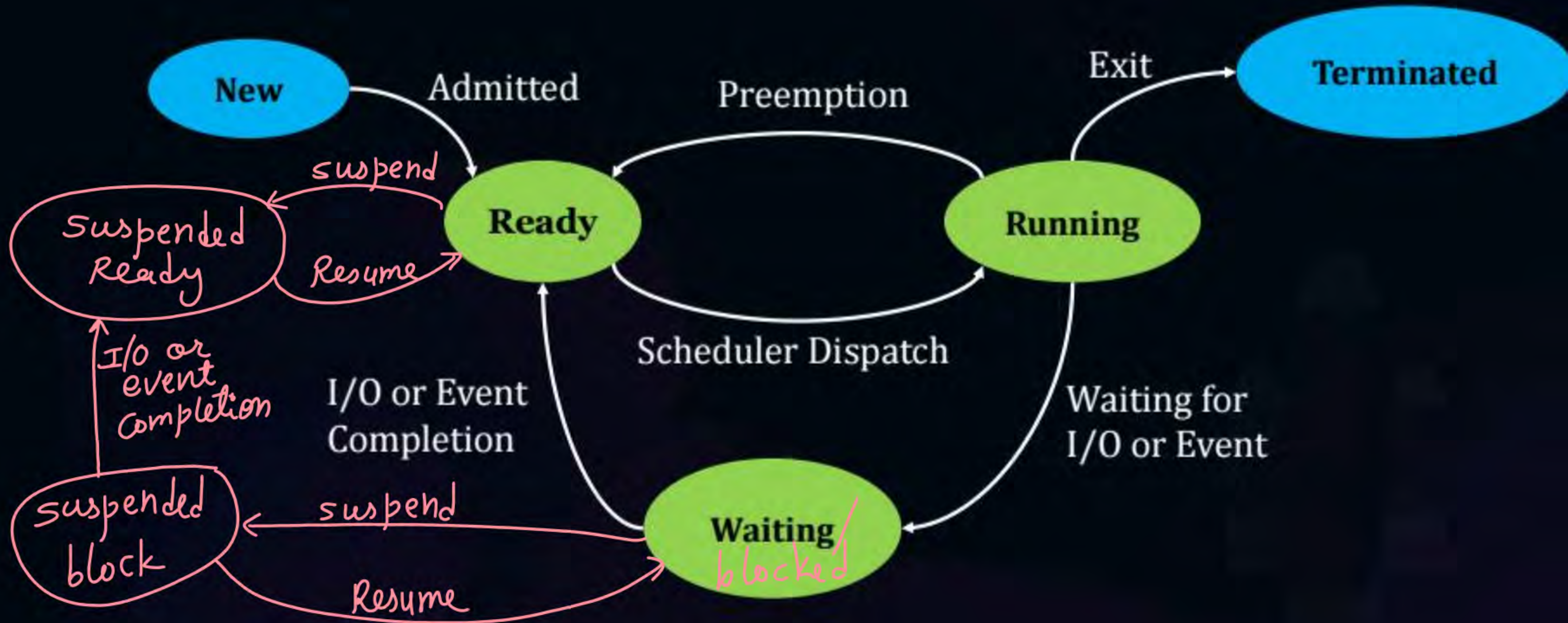
If swapping is done on the basis of priority of processes then it is called as rolling.

↳ roll-out
roll-IN





Topic : Updates Process States



\Rightarrow Long-term schedule \Rightarrow Can increase degree of multiprogr.

\Rightarrow Mid — || — | ✓ \Rightarrow — || — inc. / dec. — || —

\Rightarrow short — || — \Rightarrow does not change — || —



Topic : CPU Scheduling



Function:

- Make a selection

Goal

- Minimize Wait time and Turn-around time Maximize CPU utilization
- (Throughput) Fairness

#Q. Which of the following scheduler reduces the degree of multiprogramming?

- A** Short-Term
- B** Long-Term
- C** Mid-Term
- D** Long-Term and Mid-Term both



2 mins Summary



Topic

Process states

Topic

Process State Transition

Topic

Process Scheduling

Topic

Types of Schedulers



Happy Learning

THANK - YOU