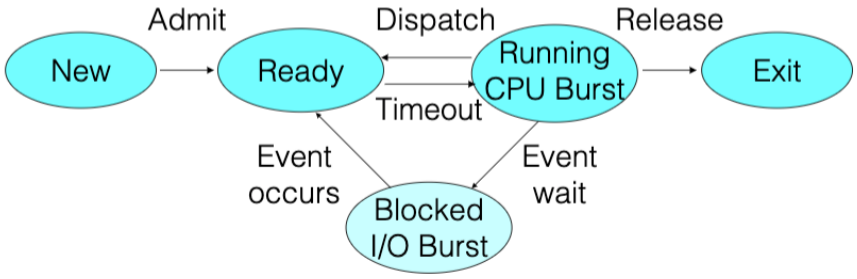
Vocabulary

1. **Multiprogramming**
   - Is the technique of utilizing several programs concurrently in a single computer system
2. **Mechanism**
   - Is low-level methods or protocols that implement a needed piece of functionality
   - Is low-level machinery in OS
   - Does not dictate policies
3. **Policies**
   - Are algorithms for making some kind of decisions within the OS
   - Is high-level intelligence in OS
   - Does not dictate mechanism
4. **CPU Bound**
   -
5. **I/O Bound**
6. **Non-preemtive Scheduling**
   - Is the type of scheduling that once the CPU has been allocated to a process, it keeps the CPU until it terminates or blocks
7. **Preemtive Scheduling**
   - Is type of scheduling where CPU can be taken from a running process and allocated to another
8. **Context Switching**
   - Is dispatching a process from a ready queue
9. **Convoy Effect**
   - All other processes wait for the one big process to release the CPU

1 Recall State Diagram

- Thread/Process is blocked during I/O burst and therefore **does not use CPU**



2 Scheduling Goals

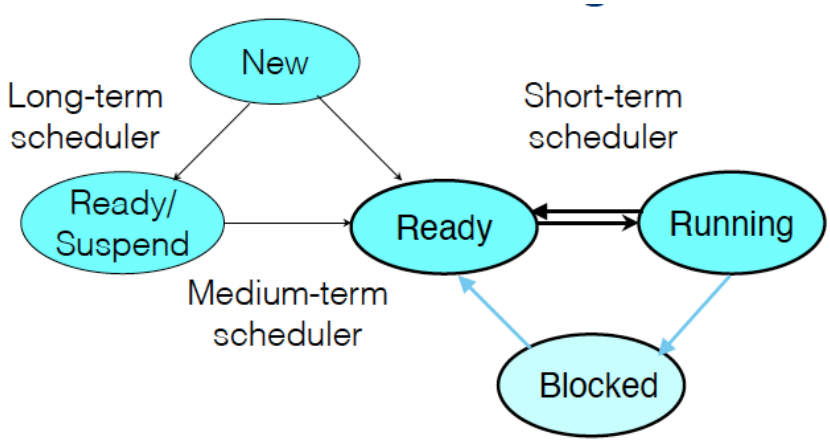
- All Systems
  - Fairness - Each process receives fair share of CPU
  - Avoid starvation
  - Policy enforcement - Usage policies should be met
  - Balance - All parts of the system should be busy
- Bach Systems
  - Throughput - Maximize job completed per hour
  - Turnaround time - Minimize time between submission and completion
  - CPU utilization - Keeps the CPU busy all the time

3 Scheduling Goals

- Interactive Systems
  - Response time - Minimize time between receiving request and starting to produce output
    - Response time = First Run Time - Arrival Time
  - Proportionality - "Simple" tasks complete quickly
- Real-Time Systems
  - Meet deadlines
  - Predictability

4 Process State Diagram

- Dispatching a process from the ready queue is called **context switching**



5 Algorithm: Shortest Job First

- Is optimal with respect to **average wait time**

6 Algorithm: Round Robin

- Designed for time-sharing systems
- Pre-emptive
- Ready queue is circular
- Choice of quantum is chritical