

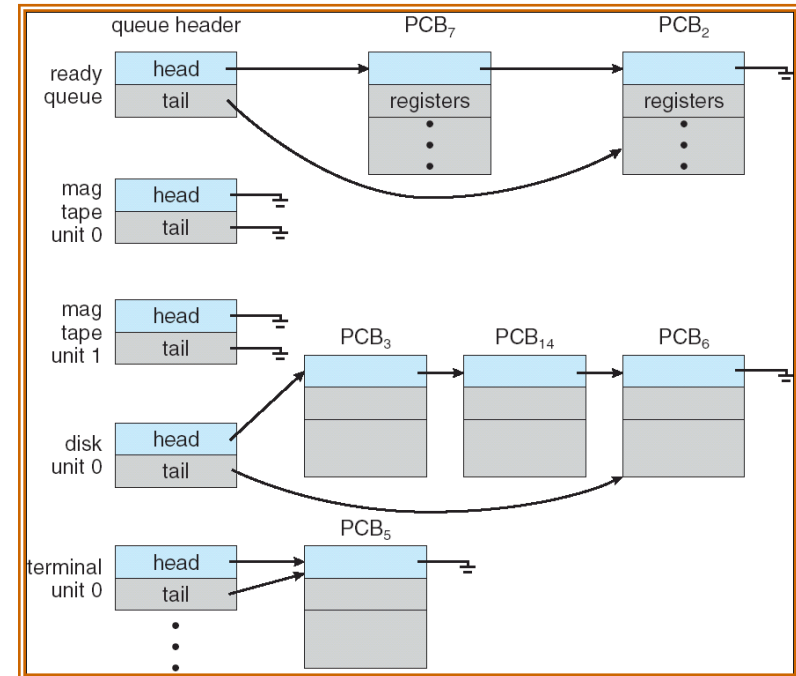


Processes

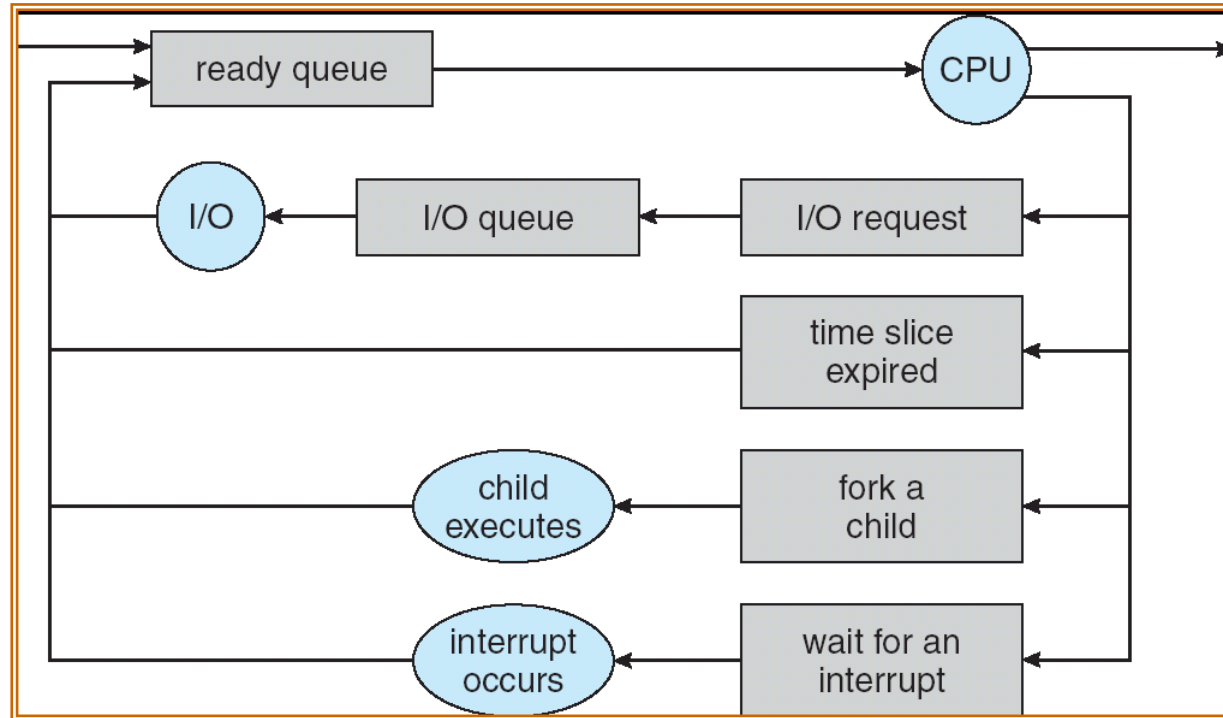
Process Scheduling

Process Scheduling (I)

- Process scheduler: select an available processor for execution
 - Multiprogramming & multitasking
- Scheduling queues
 - Job queue
 - Ready queue – linked list of PCBs
 - Device queue



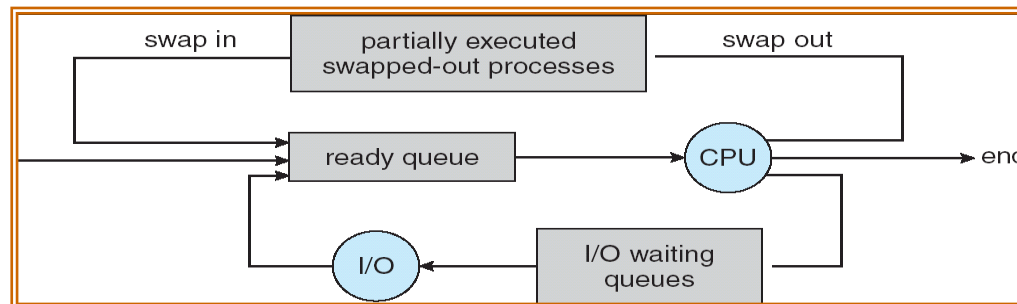
Process Scheduling (2)



- Queuing diagram
- Process dispatch = select for execution

Process Scheduling (3)

- Long-term scheduler – select processes from disk to load to main memory
 - Control degree of multiprogramming
 - UNIX and Windows have no long-term scheduler – rely on physical system limits and users
- Short-term (CPU) scheduler – allocate the CPU to one of the ready processes
- Different frequency of execution
 - Minutes versus milliseconds
- I/O-bound versus CPU-bound process
 - A good mix of I/O and CPU bound processes is essential
- Medium-term scheduler - swapping



Process Scheduling (4)

- Context switch: switching the CPU to another process
 - State save & state restore
 - Pure overhead
 - Speed – few milliseconds
 - Special instructions
 - Multiple sets or registers
 - Complexity of the operating system (memory management)

For contemplation

- Describe the differences among short-term, medium-term, and long-term scheduling.
- Describe the actions taken by a kernel to context-switch between processes.
- The Sun UltraSPARC processor has multiple register sets. Describe the actions of a context switch if the new context is already loaded into one of the register sets. What else must happen if the new context is in memory rather than in a register set and all the register sets are in use?