The Process Manager

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Systems are built from cooperating processes

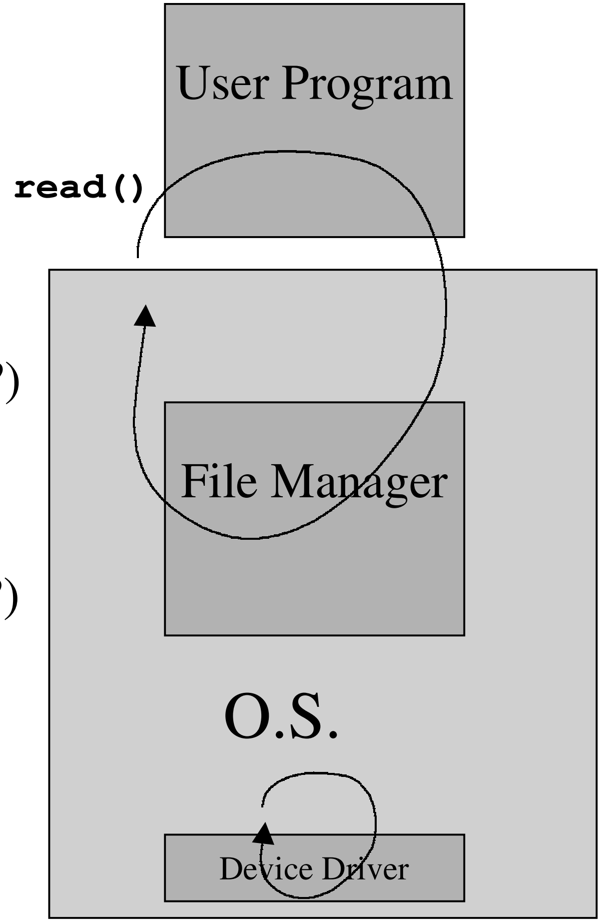
Issues:

- Concurrency
  - many activities simultaneously
- Synchronization
  - stop/go interaction between active processes

What is a process?

- A container to run software in
- Contains:
  - Flow of control
  - Address Space
  - Register values
  - External interfaces (to files, networks, other processes, etc.)

Process Interaction Example



File Manager

- translate UFID to SFID
- allocate buffer space (block?)
- pass request to driver
- block until complete
- return data to user (unblock?)

Device Driver:

- block waiting for work
- initiate disk transfer
- block waiting for interrupt
- pass data to requestor

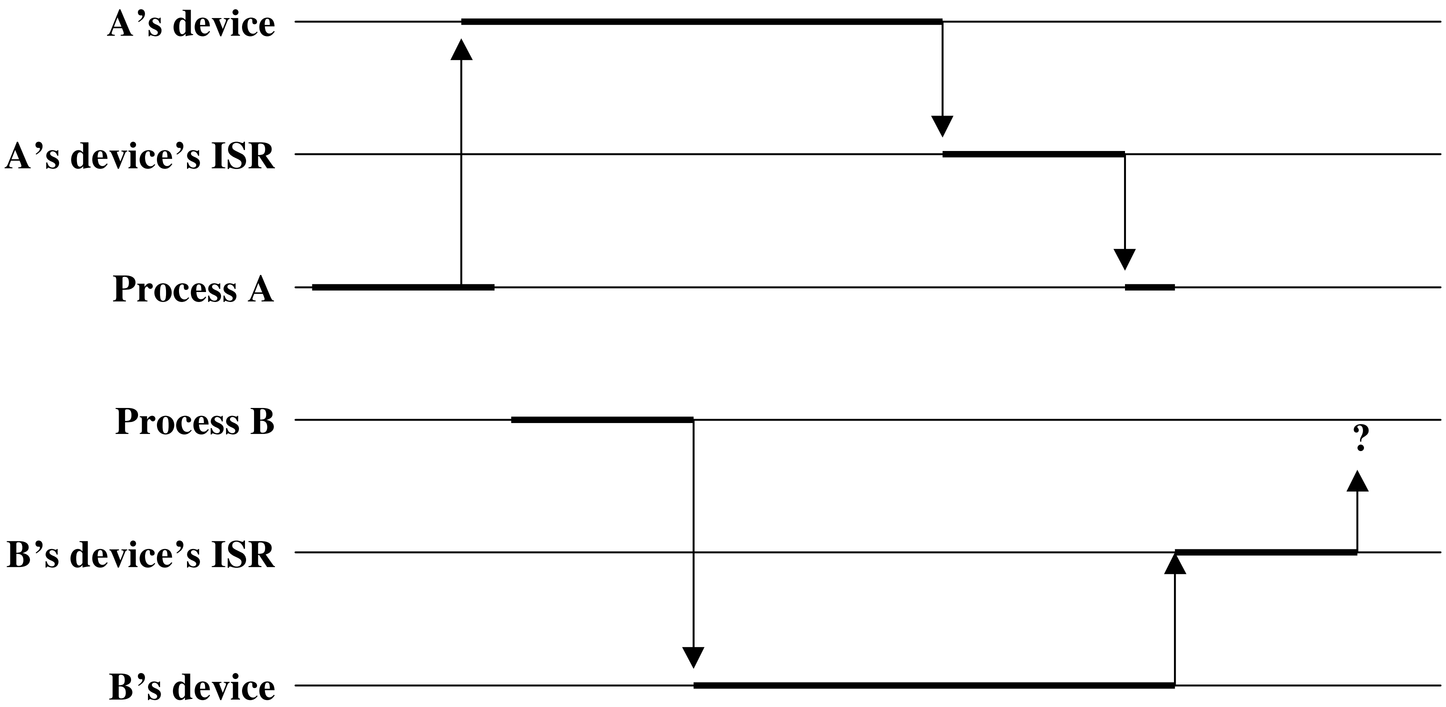
Where should OS create processes?

- One process for each source of asynchronous events
  - many processes, lots of inter-process synchronization

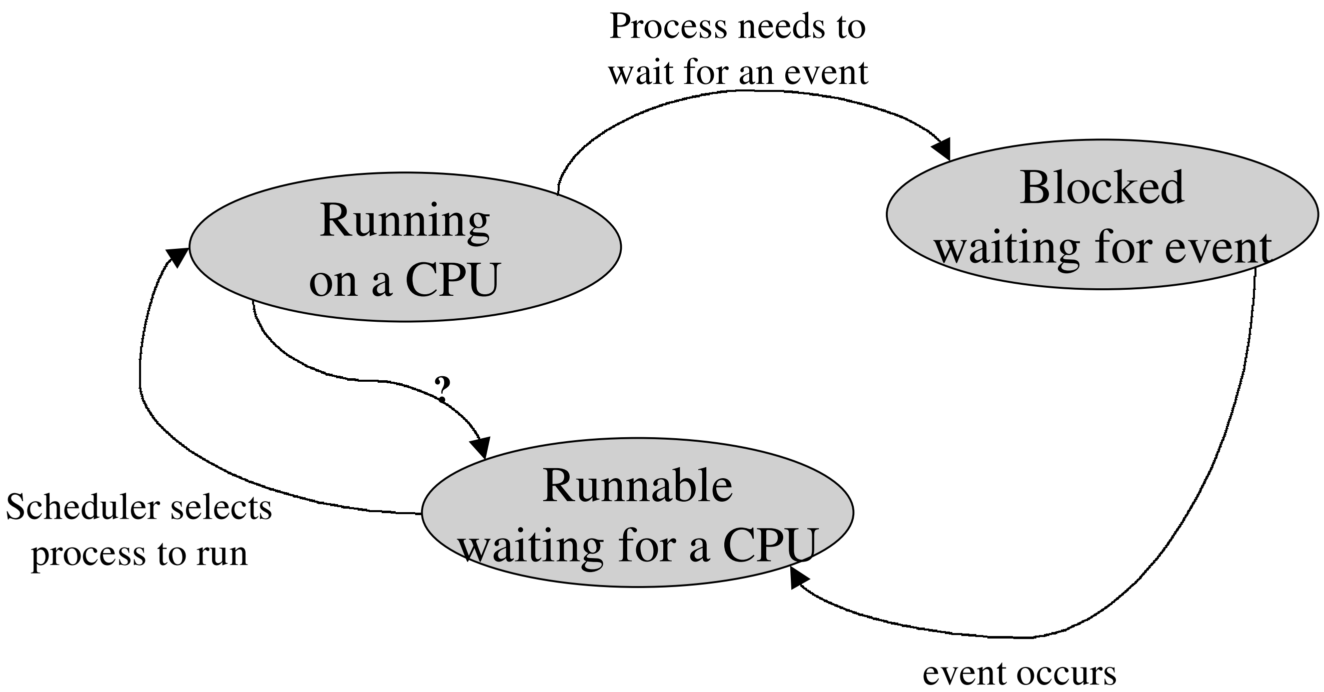
or

- One process per program
  - few processes, complex internals to handle many events

Multiple Concurrent I/O transfers



Process State



Process Descriptor

- Process ID
- Priority
- Process State
- Reason for waiting
- Record of events
- Saved registers: PC, SP, General Registers, etc.
- Exception address
- Time Slice
- Time left to run
- Pointers to open files, allocated memory, network connections, etc.