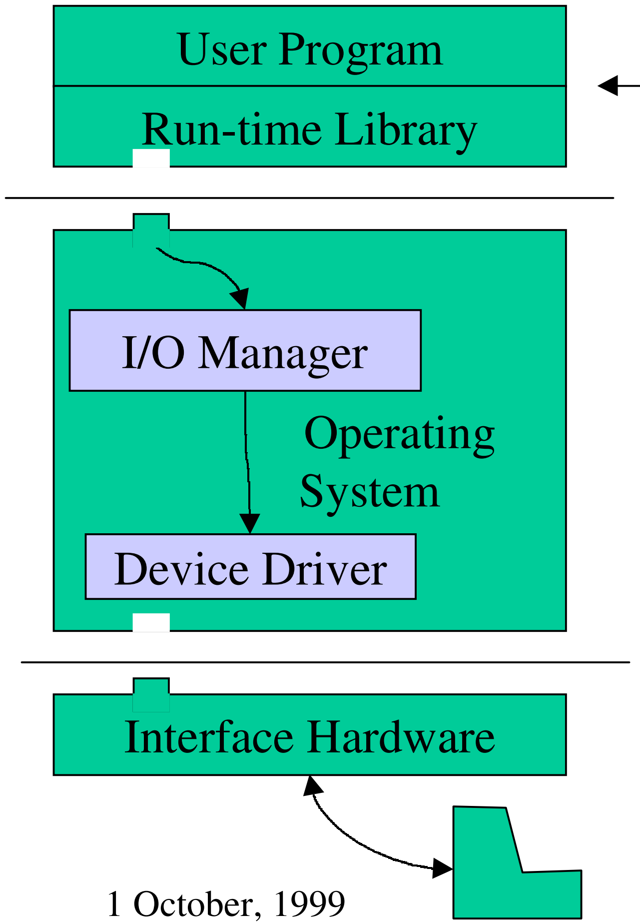
Device Management



e.g. printf(“hello”)

language I/O interface

System Call interface:
… write stream of chars

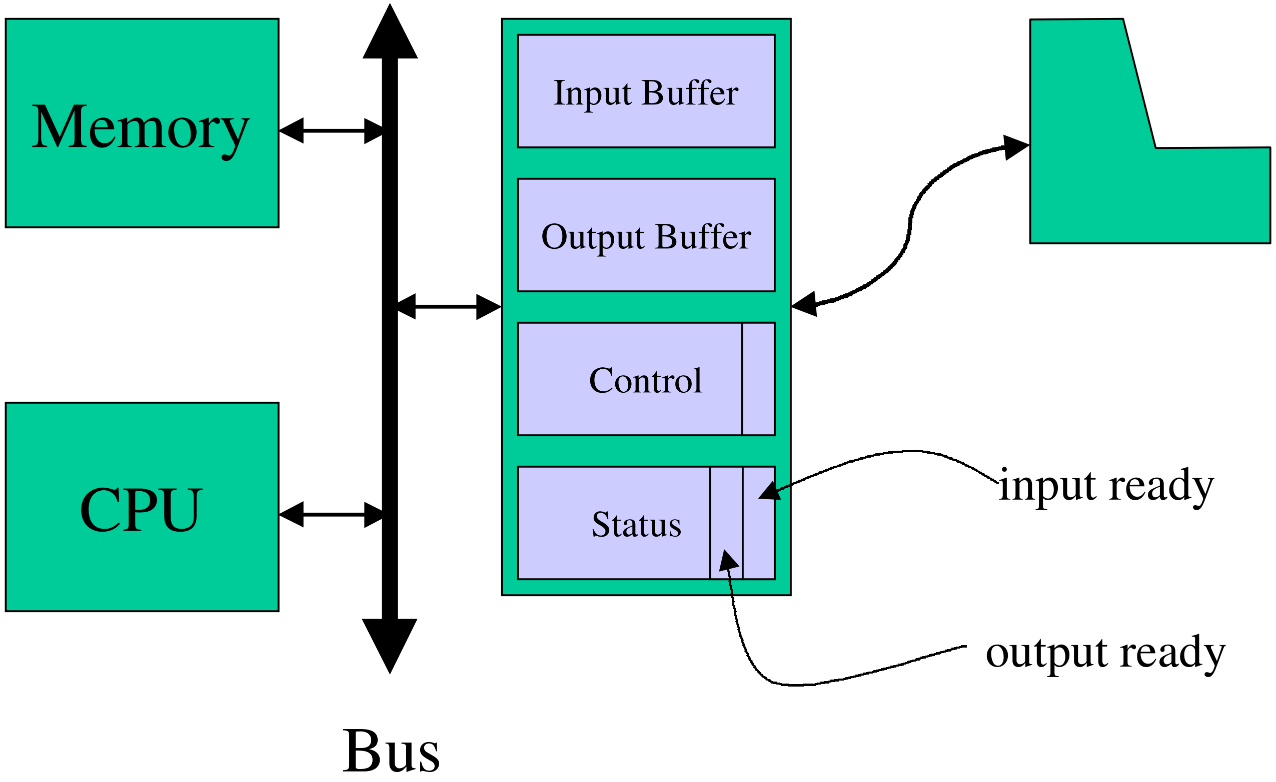
Identify device,
check permissions

Hardware interface:
…write character
… put bits on screen
… write disk block

Device Speeds

Device	Transfer Rate (bytes per second)	Instructions per byte transferred
Keyboard	10	
56K modem		
Ethernet (Cable modem? ADSL?)		
Disk Drive		
Screen		

An Input/Output interface

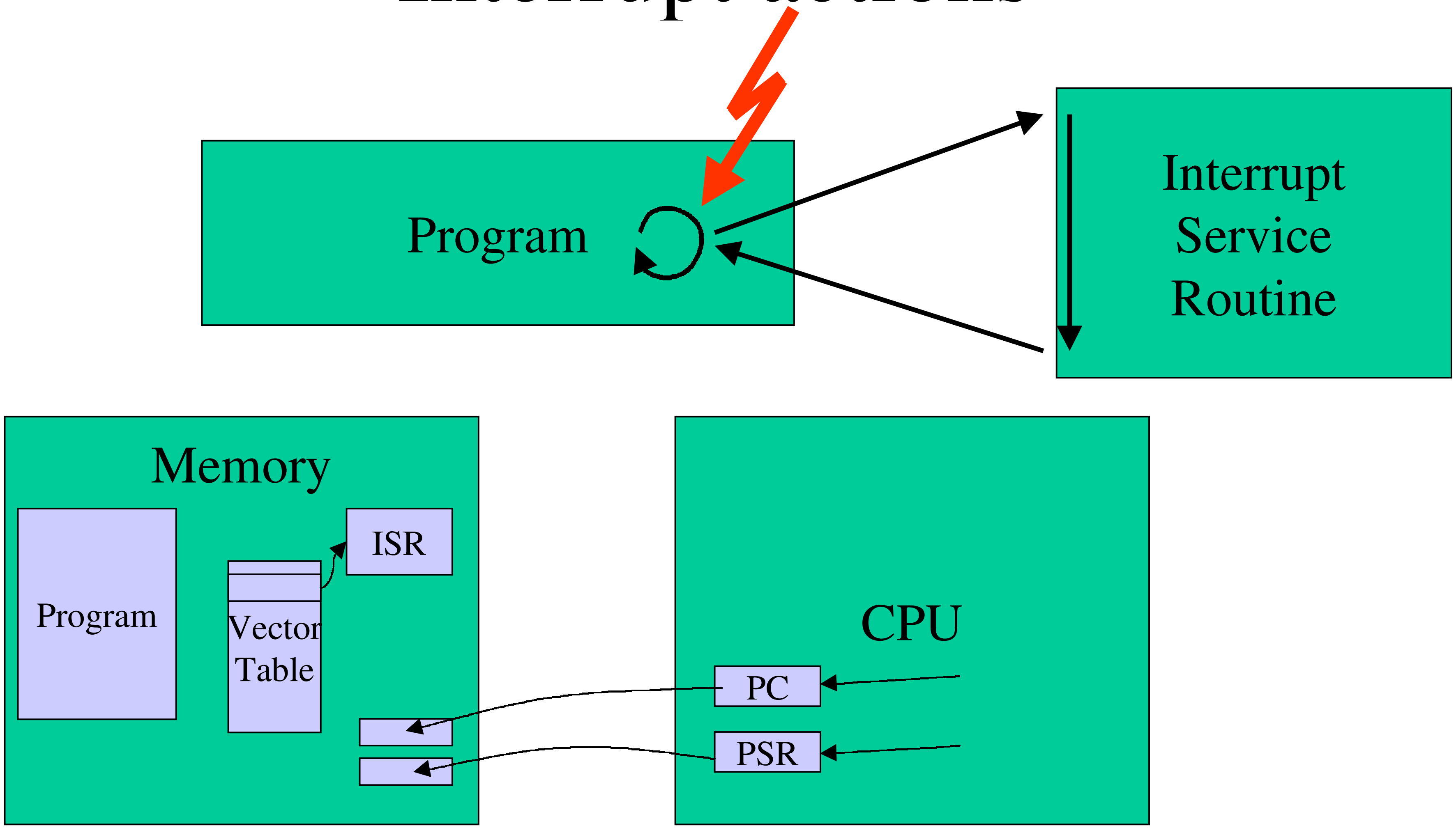


Synchronising CPU and I/O

- Polling:
  - CPU loops waiting for I/O ready
  - simple, reliable
  - slow if many quiescent devices
  - wastes CPU time (who cares?)

- Interrupts:
  - CPU initiates I/O action
  - CPU does other stuff
  - I/O interface signals ready by interrupting CPU

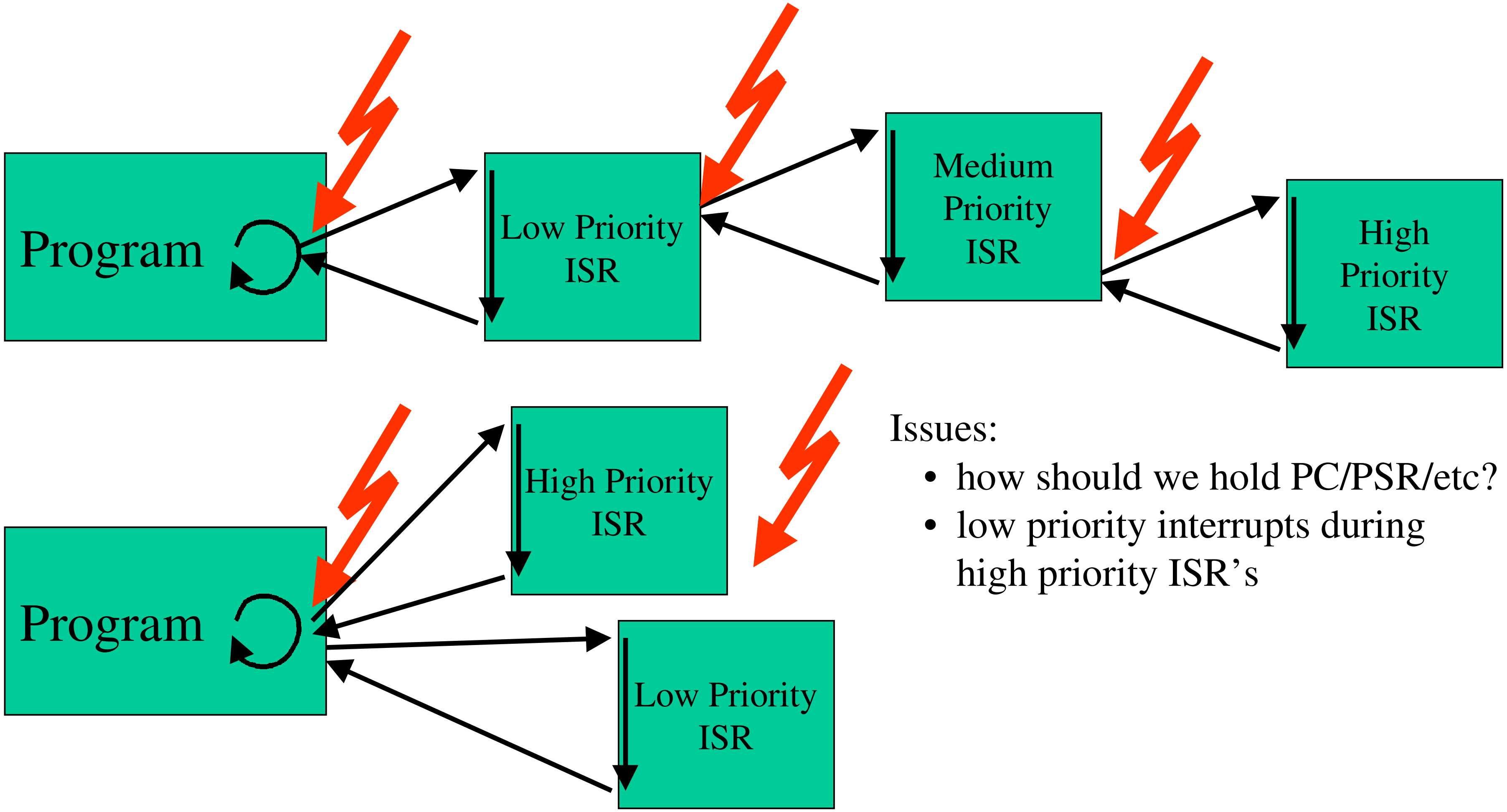
Interrupt actions



Interrupt Priorities

- Some events:
  - routine
  - urgent
    - should interrupt routine events
  - critical
    - should interrupt urgent and routine events

Priorities in action



Issues:

- how should we hold PC/PSR/etc?
- low priority interrupts during high priority ISR's

Assigning Interrupt Priorities

- High Priorities
  - What type of devices?

- Lower Priorities
  - What type of devices?