Interrupts

Networks and Embedded Software

Module 4.3.2

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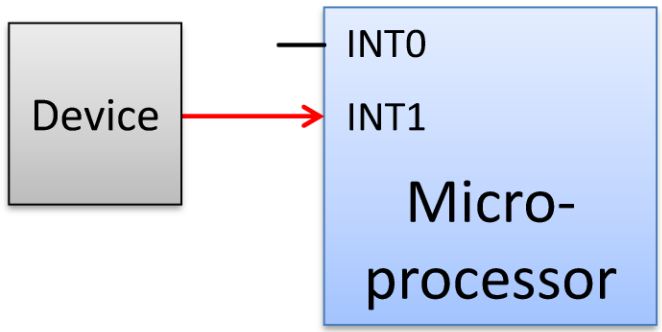
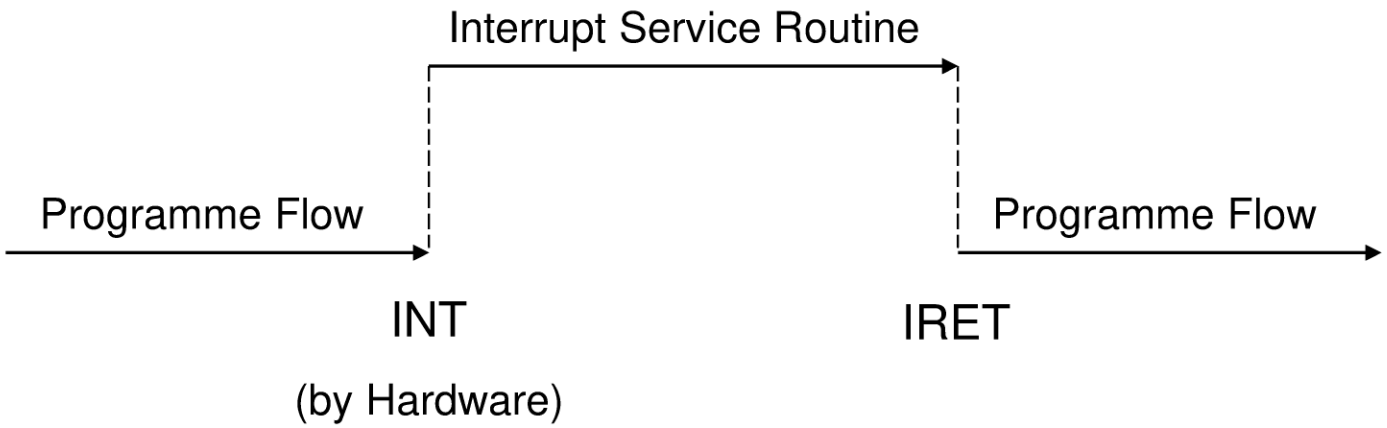
Interrupts (1)

- Generated by hardware
- Indicated by an interrupt line
- Occur unpredictably
- Tell that something happened
- Examples
  - Port interrupt
  - Timer interrupt
  - Data ready interrupt



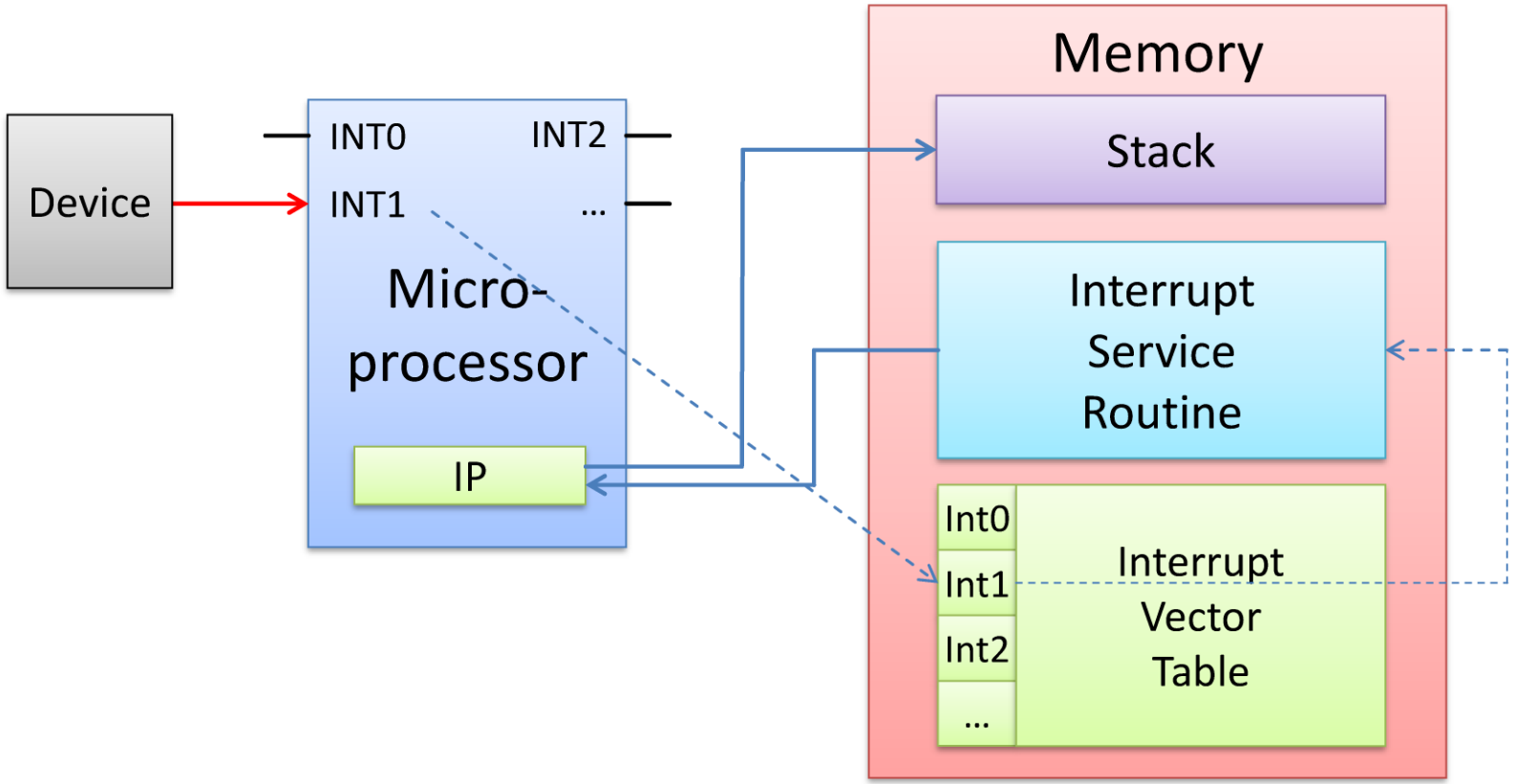
Interrupts (2)

- Interrupt Processing
  - Execution of code is interrupted
  - Interrupt service route (ISR) is executed
  - Execution of original code is resumed.



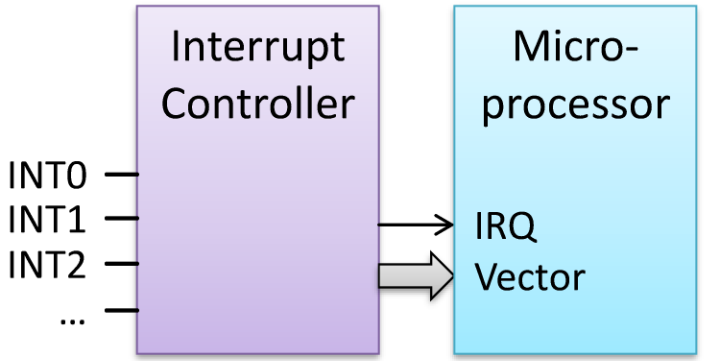
Interrupts (3)

- Interrupt Vector Table (IVT)



Interrupts (4)

- Interrupt Controller
  - Handles Interrupts
    - Queueing
      - Which one is served first?
    - Nesting
      - Based on priority levels
      - Which interrupt interrupts other interrupts?
    - Forwarding
      - Notifies the CPU of an interrupt request (IRQ)



Interrupts (5)

- Using Interrupts
  - Implement interrupt service routine
  - Assign desired interrupt priority level (optional)
  - Enable device interrupt
  - Enable interrupts globally
    - Central Processing Unit
    - Interrupt Controller

Interrupts (6)

- Interrupt Service Routine (ISR)
  - Looks like a normal C function
  - Not really a normal C function
  - Must be declared as ISR
    - Macro
    - Attributes
    - Pragma