

# COL788: Advanced Topics in Embedded Computing

Lecture 4 – System Architecture (Cont.)



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August 17, 2022

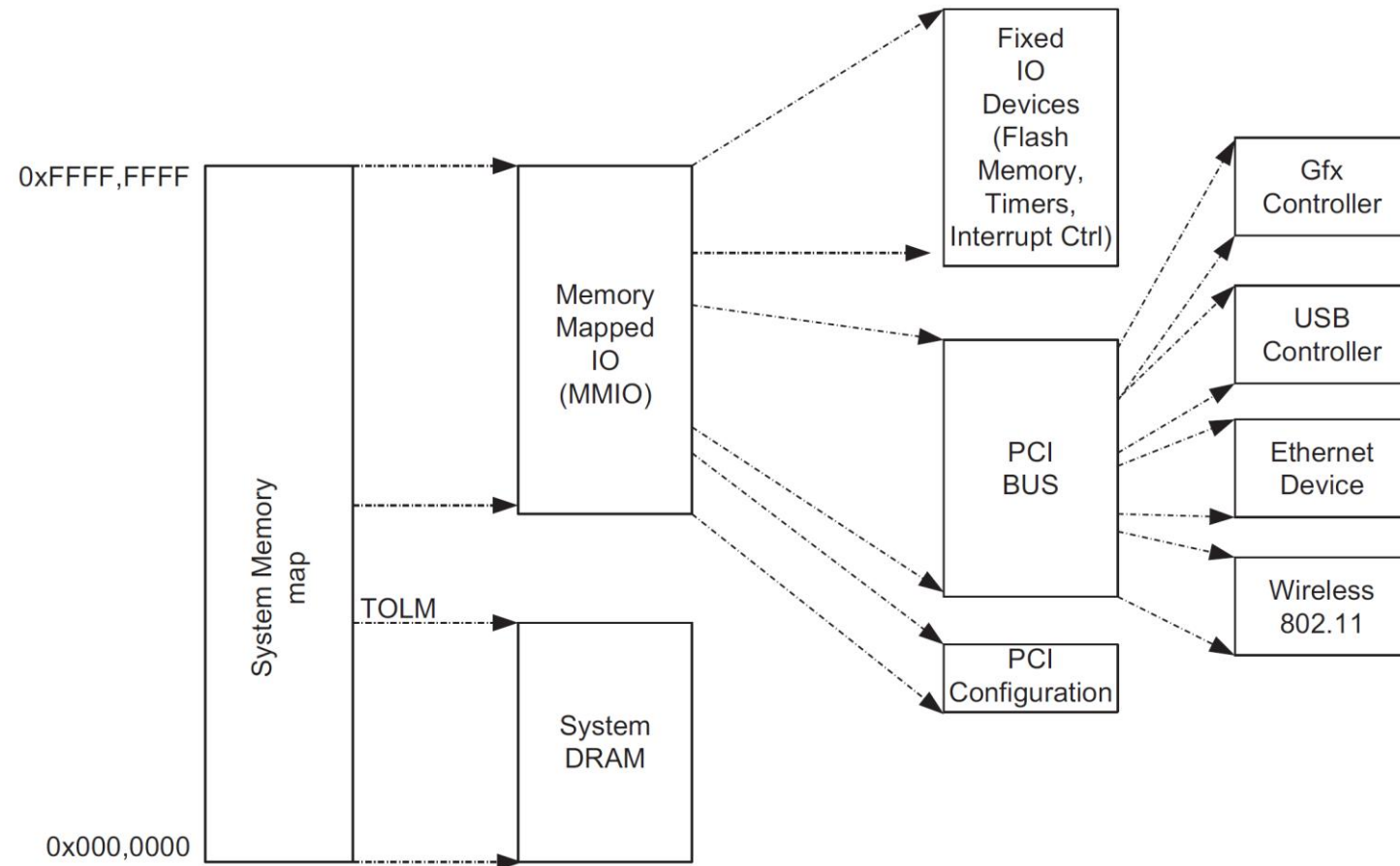
Semester I  
2022-2023

# Agenda

- Interrupt
- Timer

# Last Lecture

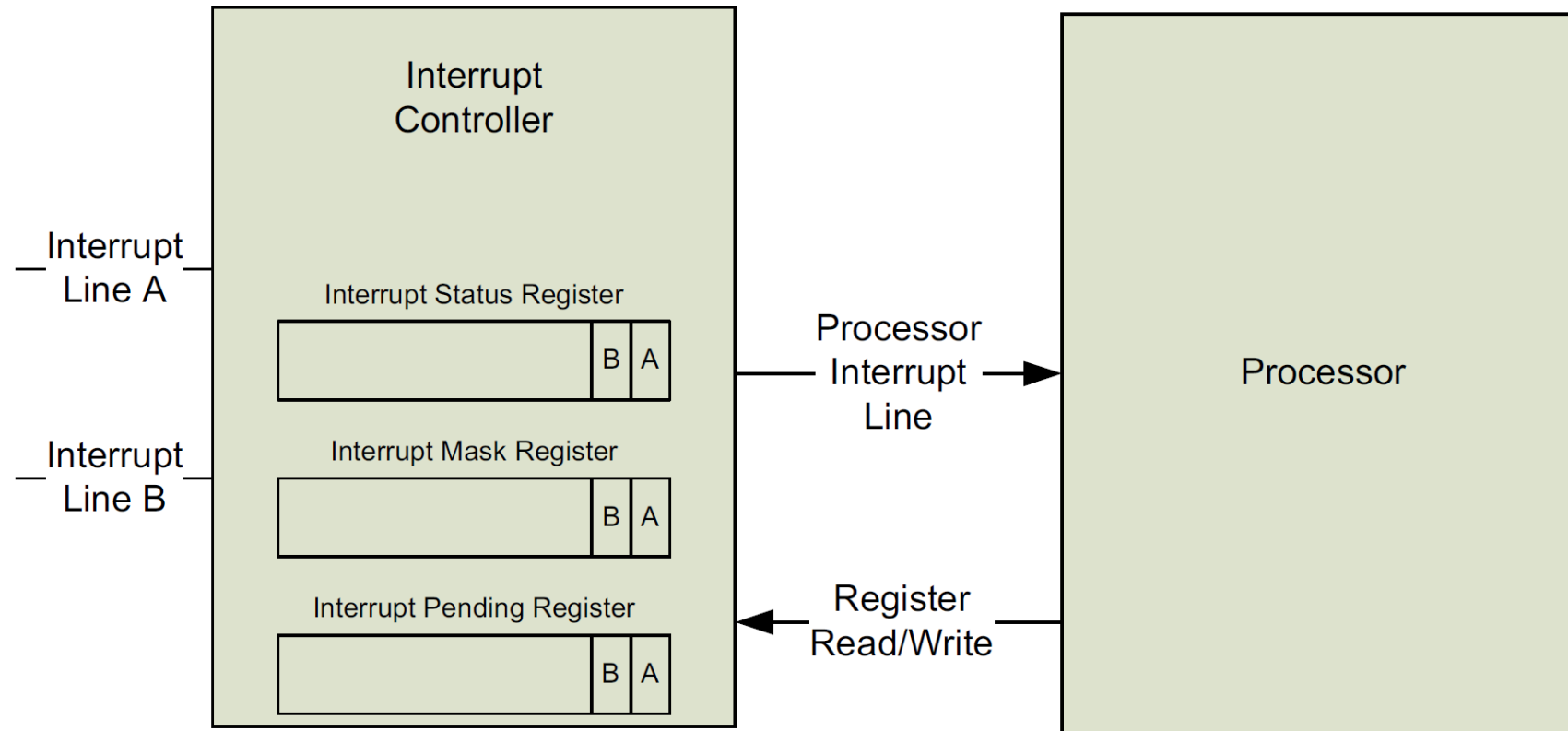
- Processor
  - CISC vs RISC
- Memory
  - Main Memory
  - MMIO



# Interrupt

- Signal produced by a hardware
  - Temporarily halts the current process
  - Interrupt service routine (ISR)
- Mitigates the need for continuous monitoring
  - Keeps the processor free
- Interrupt controller
  - Collects the interrupt events
  - Labels the events
  - Routes to the processor

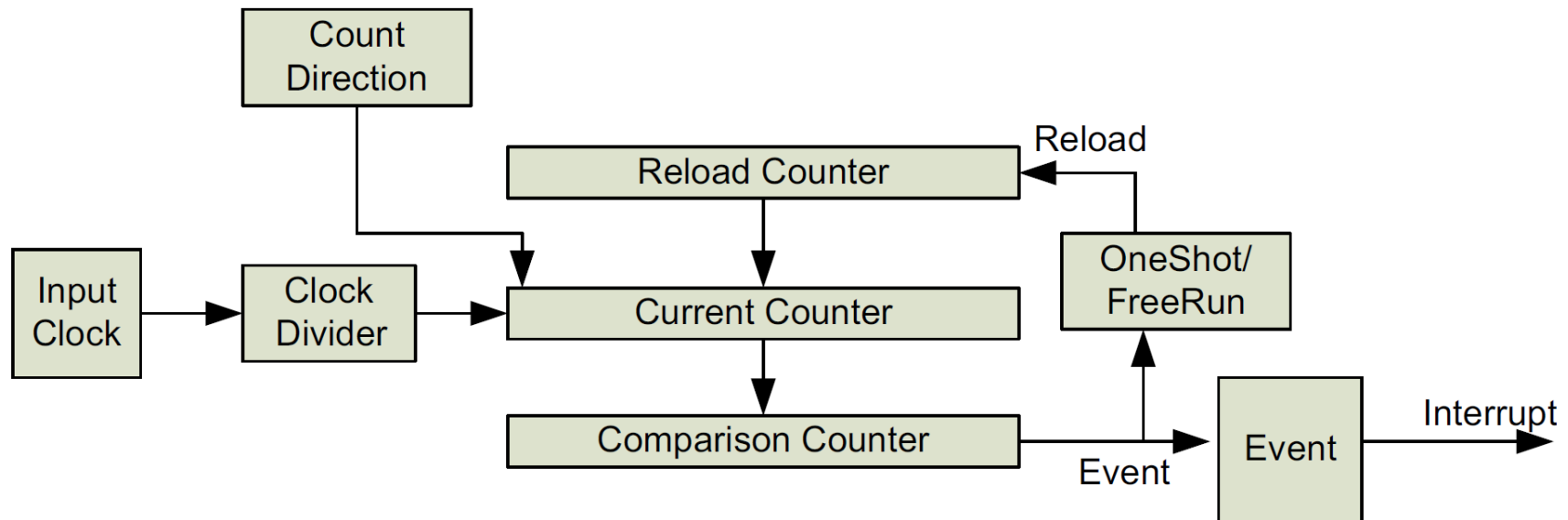
# Interrupt Controller



# Timer

- Hardware-based counter driven by a clock
- Every embedded system has at least one timer
  - Clock divider
- Attributes
  - Accuracy (parts per million (PPM))
    - 25 PPM >>> around 2 seconds per day ( $25 * 86400$  seconds per day)
  - Count direction
  - Counter size
  - One-shot or free-run

# Timer Configuration



# What's Next?

- Next Lecture (August 20, Saturday, 11 am – 12 pm)
  - Lecture 5
  - Venue: Teams