

# I/O Fundamentals

Computer Organization and Architecture  
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# Input/Output Problems

- Wide variety of peripherals
  - Delivering different amounts of data
  - At different speeds
  - In different formats
- All slower than CPU and RAM
- Need I/O modules

# Input/Output Module

- Interface to CPU and Memory
- Interface to one or more peripherals

# Generic Model of I/O Module

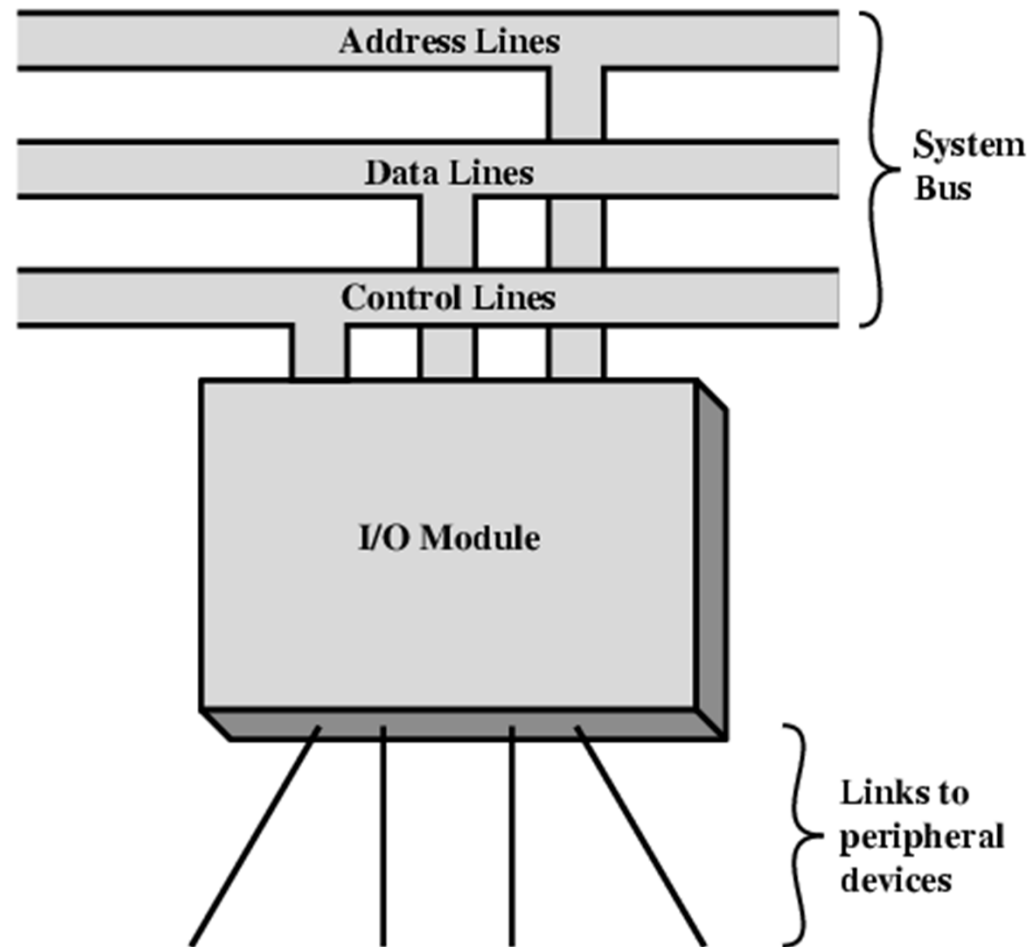


FIGURE 10-10: A Generic Model of an I/O Module

# I/O Module Function

- Control & Timing
- CPU Communication
- Device Communication
- Data Buffering
- Error Detection

# I/O Steps

- Steps needed to transfer data to or from external device to CPU:
  1. CPU checks I/O module device status
  2. I/O module returns status
  3. If ready, CPU requests data transfer
  4. I/O module gets data from device
  5. I/O module transfers data to CPU

# I/O Module Diagram

