CS305
Computer Architecture

Bus Interfacing

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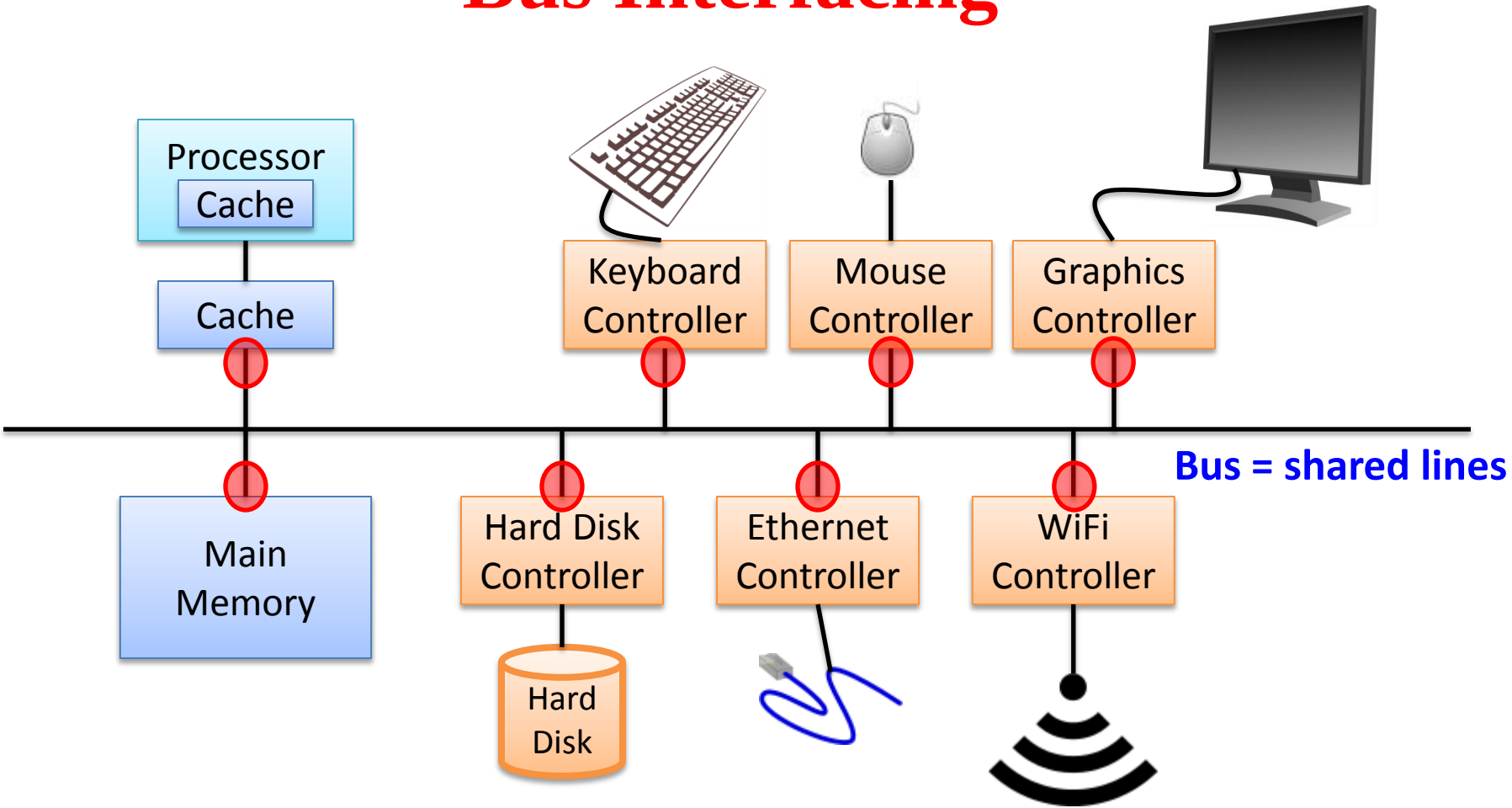
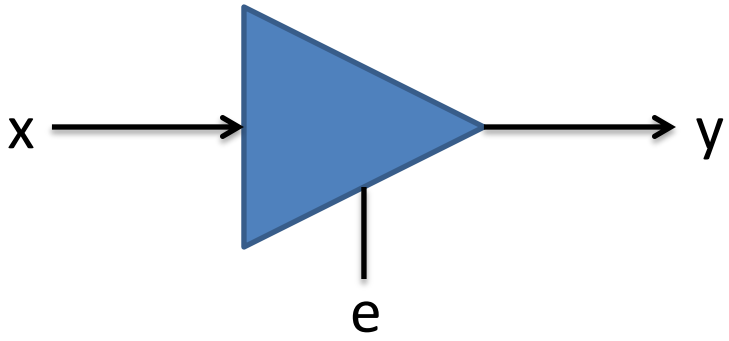
Bus Interfacing



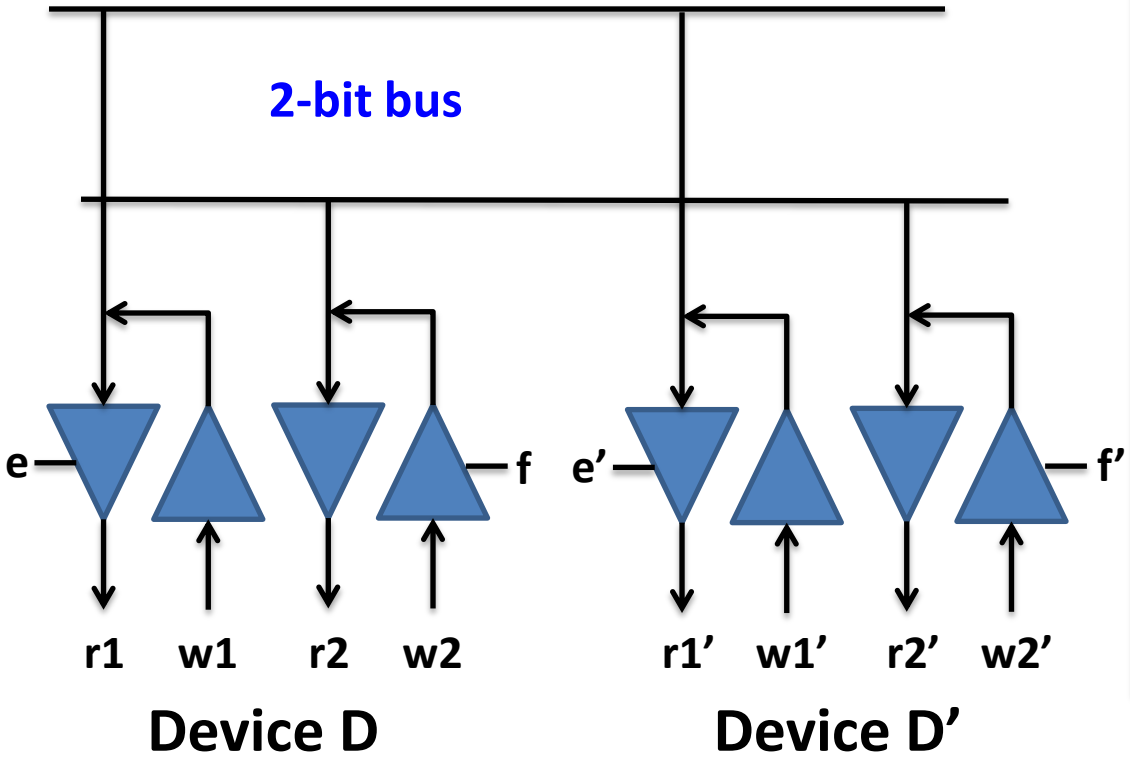
Bus Interfacing: Tri-Stating

Bus interface can be in 1 of 3 states:
0 (low voltage), 1 (high voltage), Z (disconnected, high impedance)



If (e==1), y=x
Else, y=Z (disconnected from x)

How Tri-Stating Works



- D is writing to D'
  - e=0, f=1, e'=1, f'=0
- D' is writing to D
  - e=1, f=0, e'=0, f'=1
- e=f=0 ➔ D is tri-stated
  - D is disconnected from bus
- f=f'=1 ➔ bus protocol error

Advantages of Tri-Stating

- Bus fan-out can be high
  - Most devices tri-stated most of the time anyway!
- Same bus-line can be used for input and output
  - Note: not all devices may need to drive (write to) all bus lines
  - E.g. memory need not drive address lines