L12: I/O Systems

Name: ________

ID: ________

Synchronous and Asynchronous Buses

Synchronous Bus (e.g., processor-memory buses)

- Includes a clock in the control lines and has a fixed protocol for communication that is relative to the clock
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Asynchronous Bus (e.g., I/O buses)

- It is not clocked, so requires a handshaking protocol and additional control lines (ReadReq, Ack, DataRdy)
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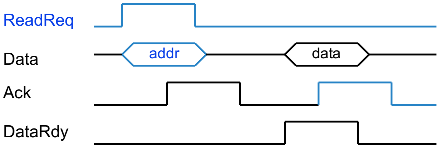
- ☺ Can be lengthened without worrying about clock skew
- ☹ Slow(er)
- ☹ More complex due to handshaking protocol

Asynchronous Bus Handshaking Protocol

Example: data from Memory to I/O devices



1. I/O device requests by raising `ReadReq` & putting addr on the data lines
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3.
4.
5.
6.
7.
8.

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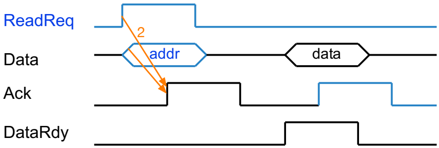

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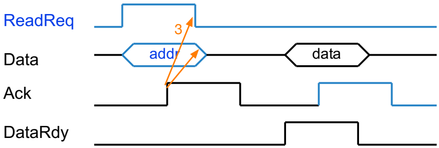

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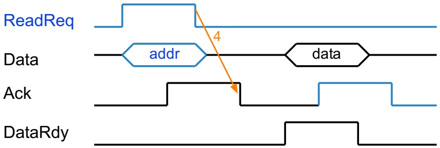

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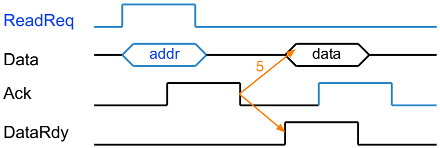

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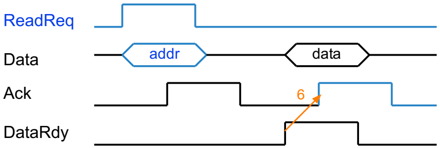

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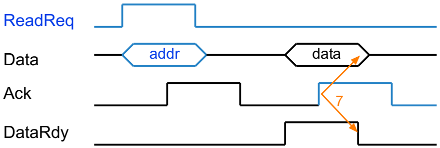

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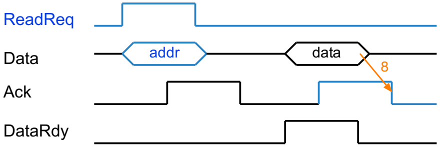

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