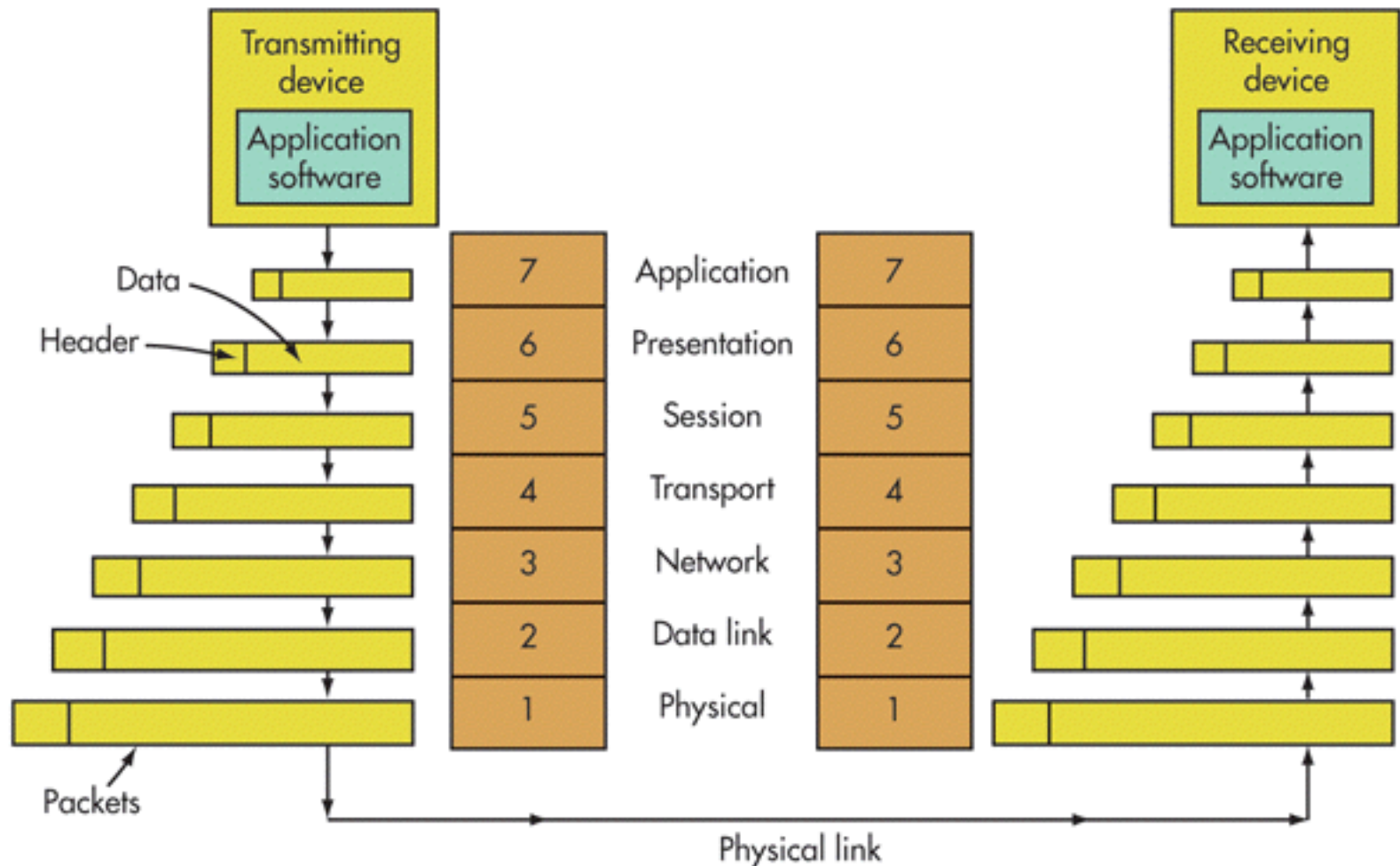# Week 10
Prerequisite Understanding

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Data Encapsulation Architecture (OSI Model)

Packet

- Fundamental unit of communication on the Internet
  - IP header
    - Includes 32-bit source address, 32-bit destination address, and 8-bit protocol fields
  - TCP header
    - Includes 16-bit source port, 16-bit destination port, flag bits (SYN, ACK), sequence number, etc.

IP header	TCP (UDP) header	Application data

Three-Way Handshake in TCP
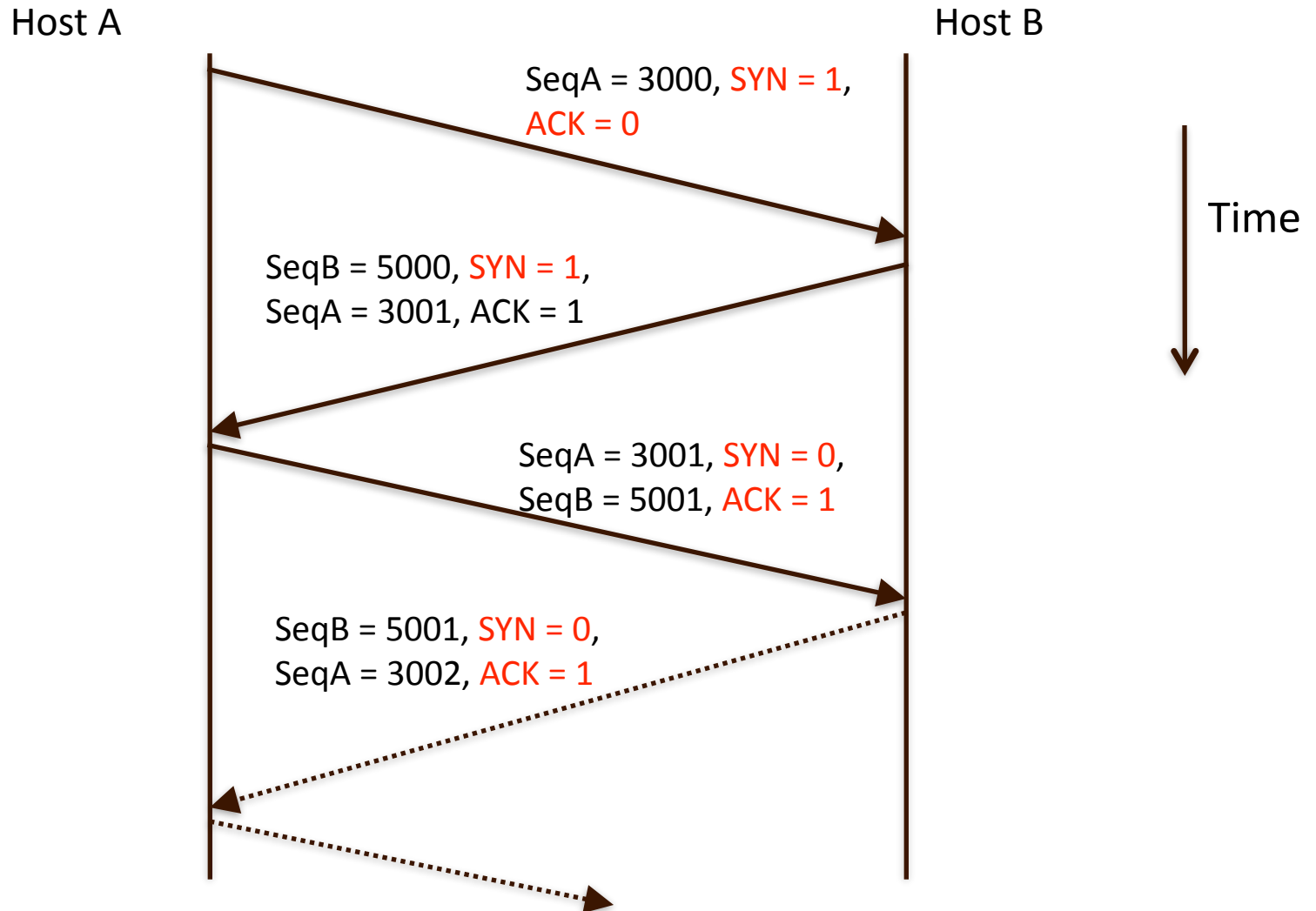
Three-Way Handshake in TCP

- Sequence numbers are used to keep data in the proper order.
  - Each host starts its own sequence number
- Acknowledgement:
  - B's ACKA acknowledges the receipt of A's segment
  - A's ACKB acknowledges the receipt of B's segment
- The first packet in each direction has the SYN bit
- All subsequent packets have the ACK bit set except for the very first packet for the entire session
  - ACK = 0 only in the very first packet of the entire session

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