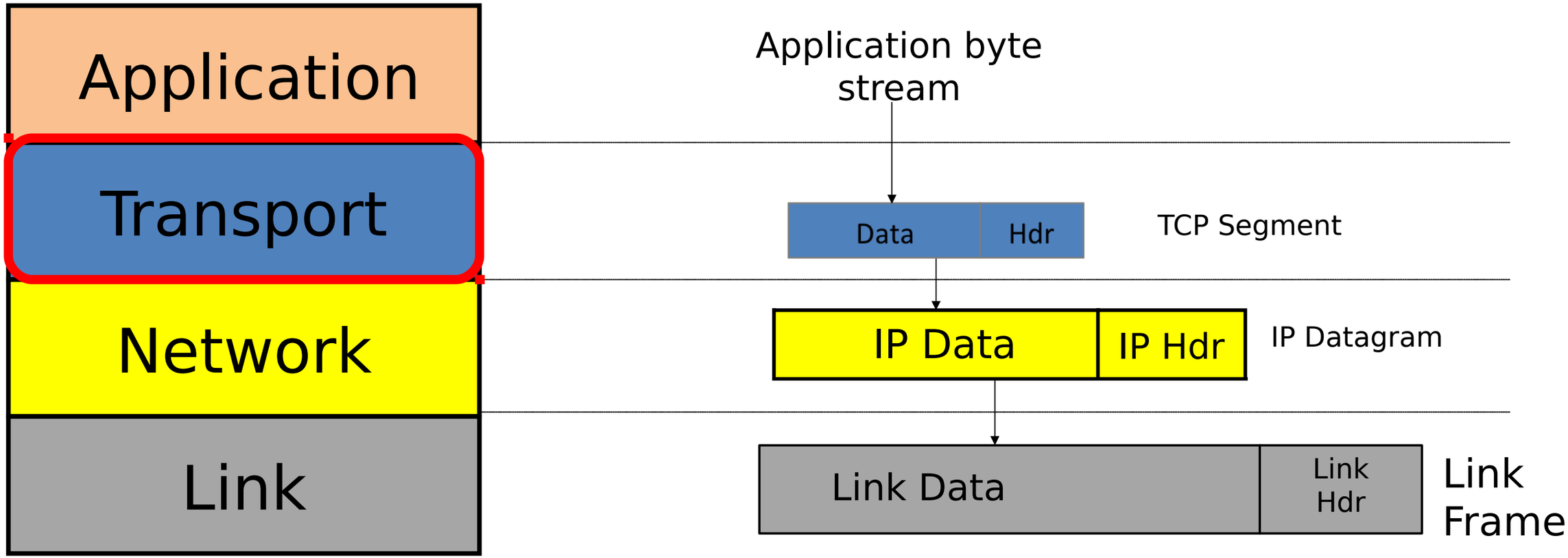
CS144
An Introduction to Computer Networks

What the Internet is

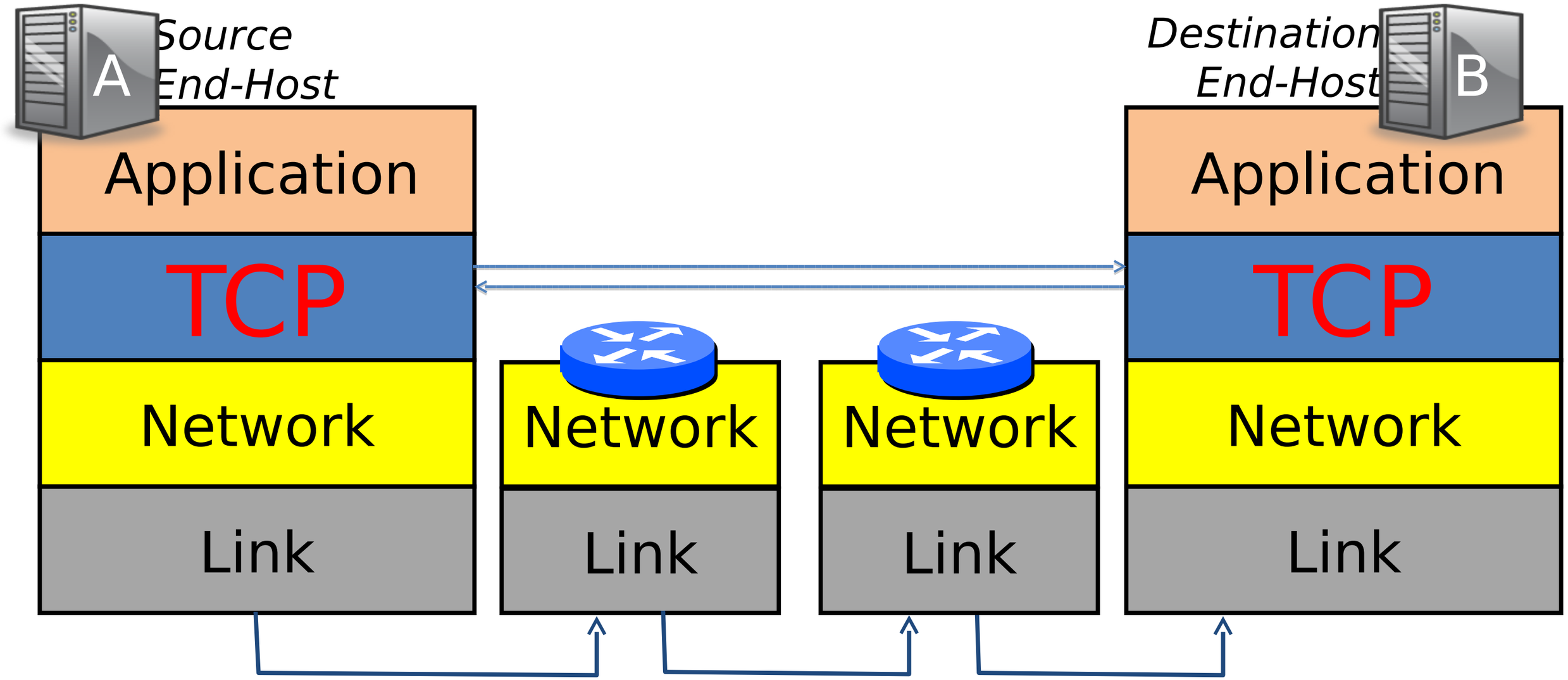
The TCP Service Model

Nick McKeown
Professor of Electrical Engineering
and Computer Science, Stanford University

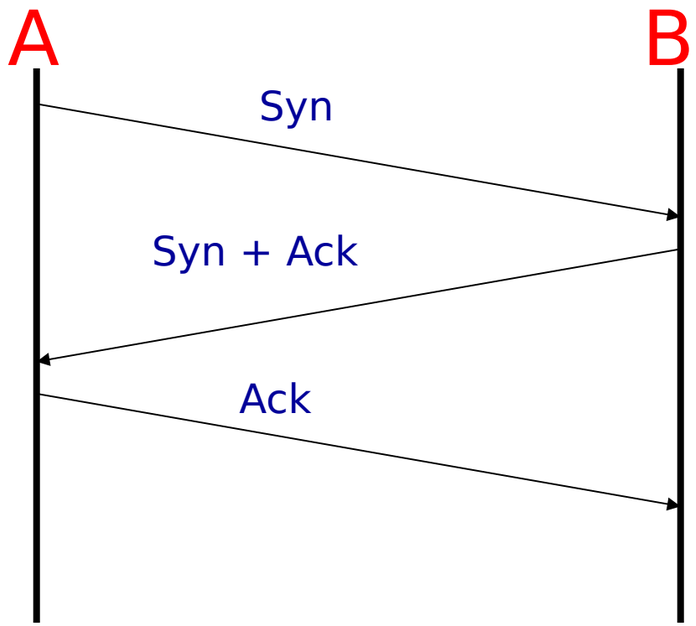
Transmission Control Protocol (TCP)



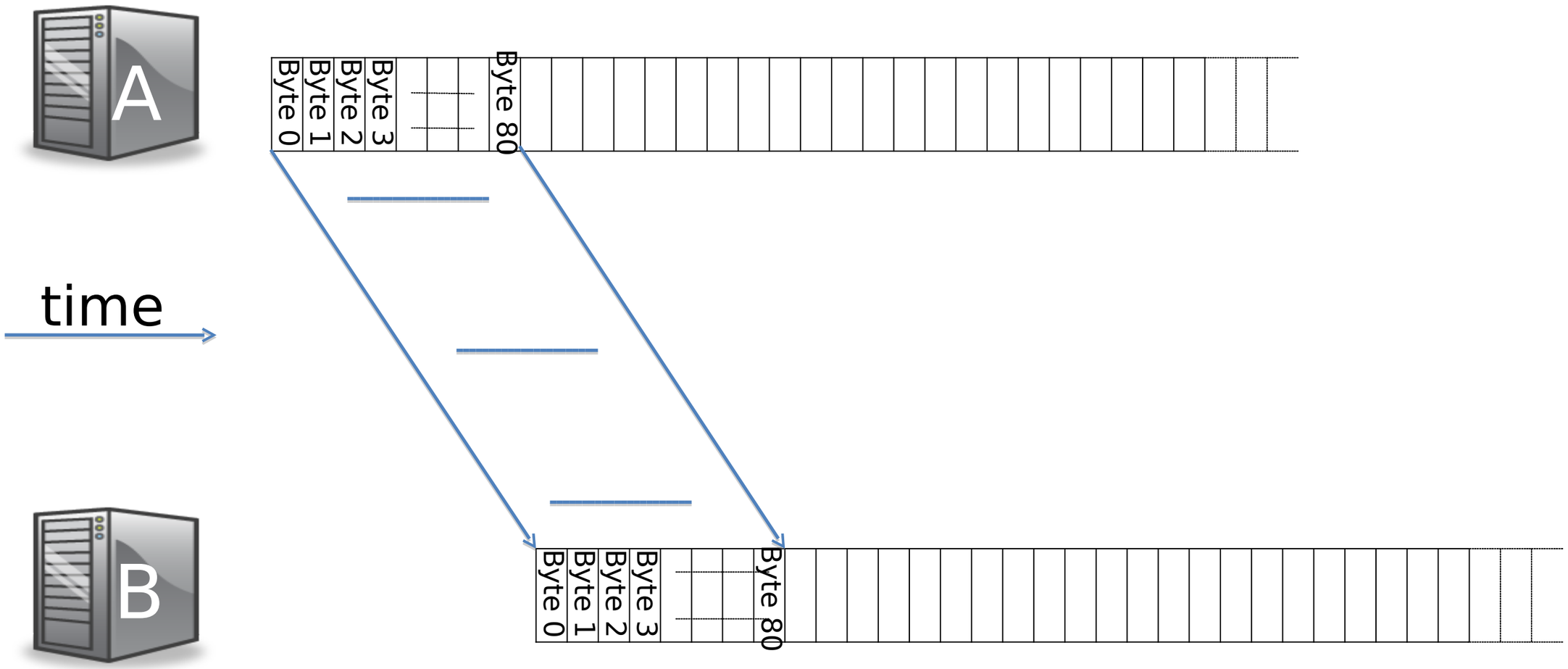
Peer TCP layers communicate



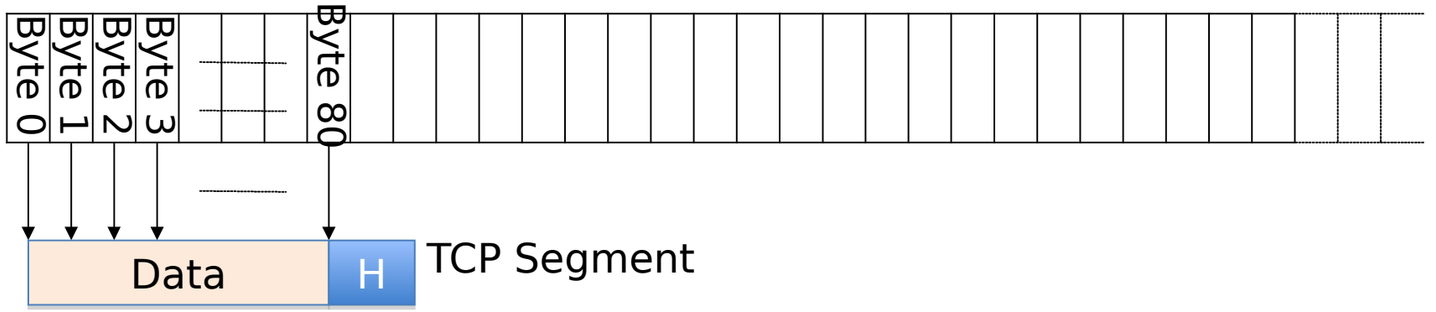
Connection setup
3-way handshake

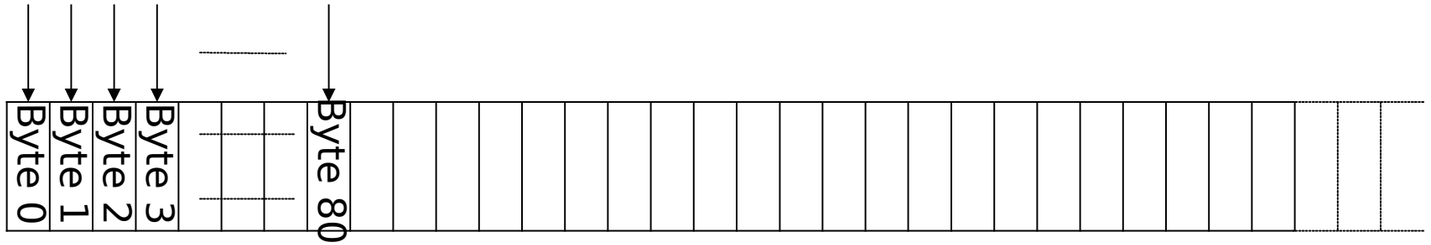


TCP “stream of bytes” service

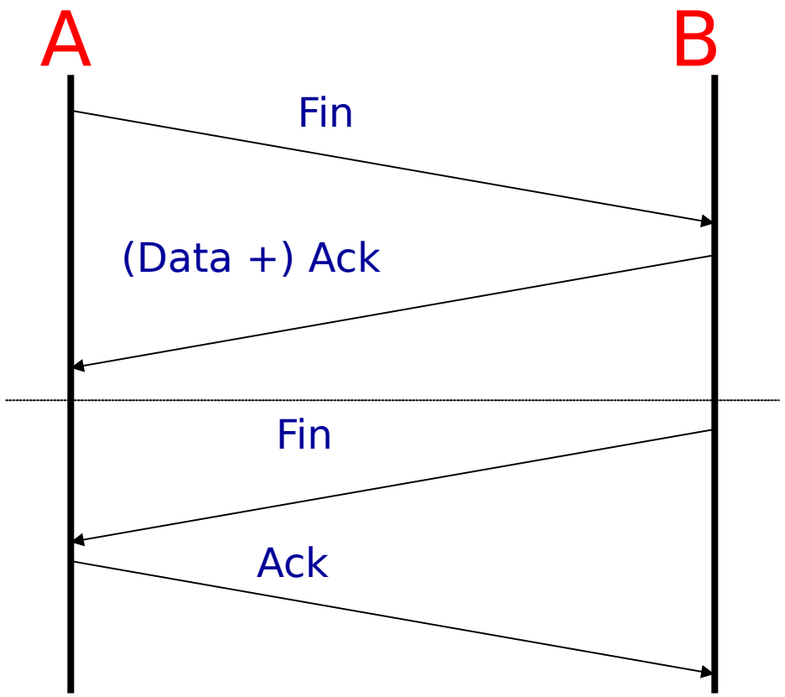


…emulated using TCP “segments”





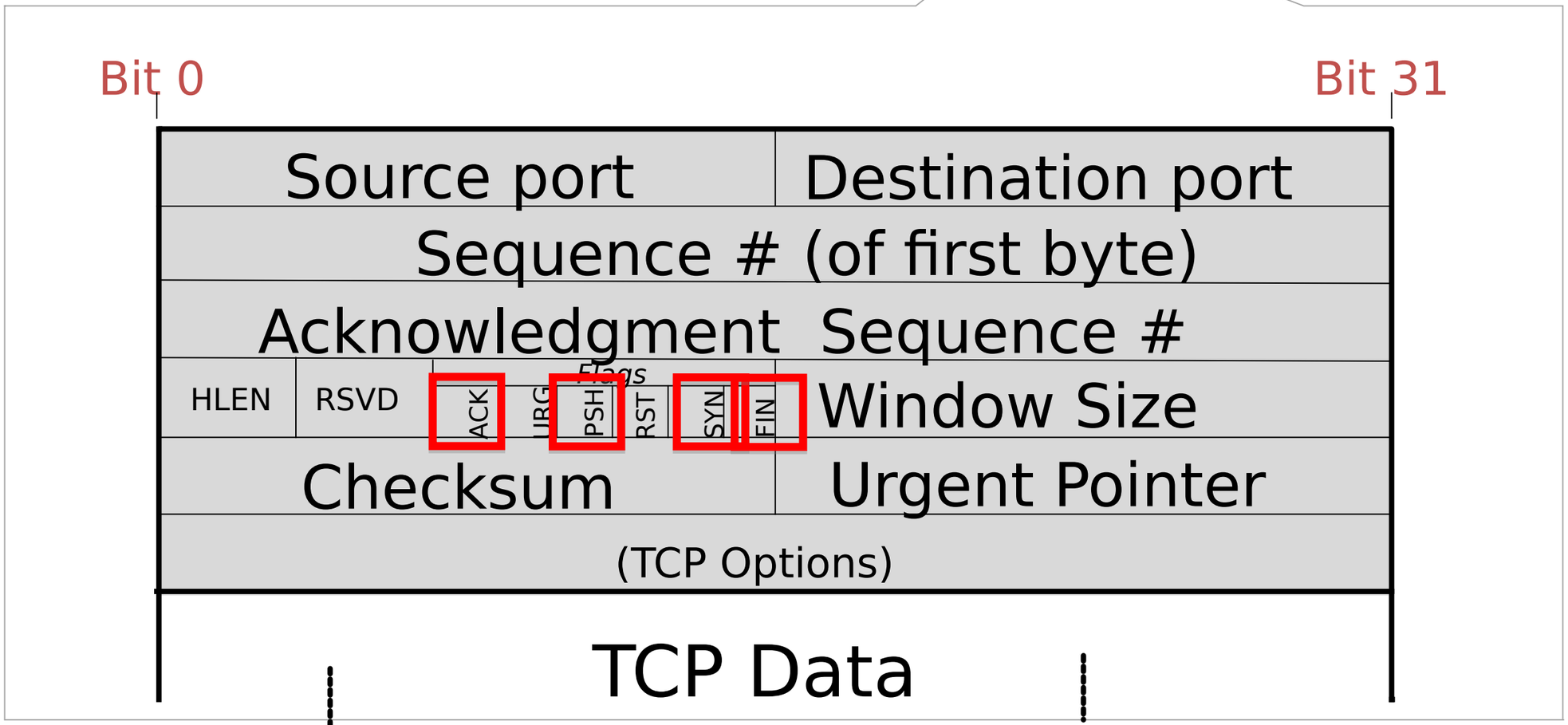
Connection teardown



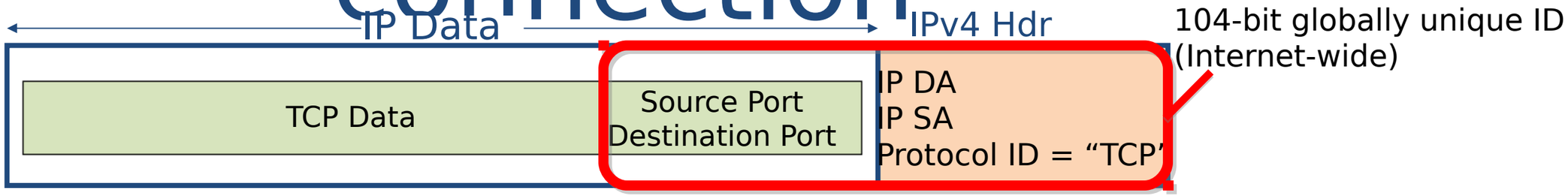
The TCP Service Model

Property	Behavior
Stream of bytes	Reliable byte delivery service.
Reliable delivery	1. Acknowledgments indicate correct delivery. 2. Checksums detect corrupted data. 3. Sequence numbers detect missing data. 4. Flow-control prevents overrunning receiver.
In-sequence	Data delivered to application in sequence transmitted.
(Congestion Control	Controls network congestion.)

The TCP Segment Format

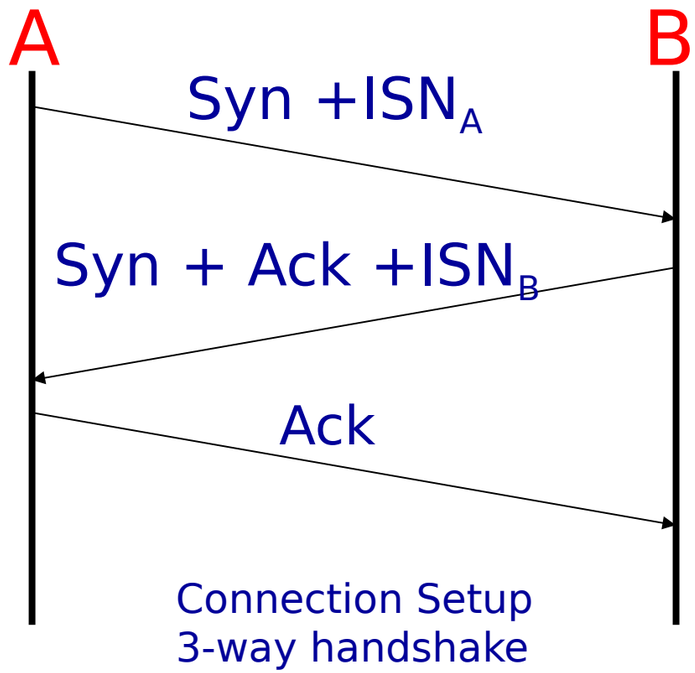


The Unique ID of a TCP connection

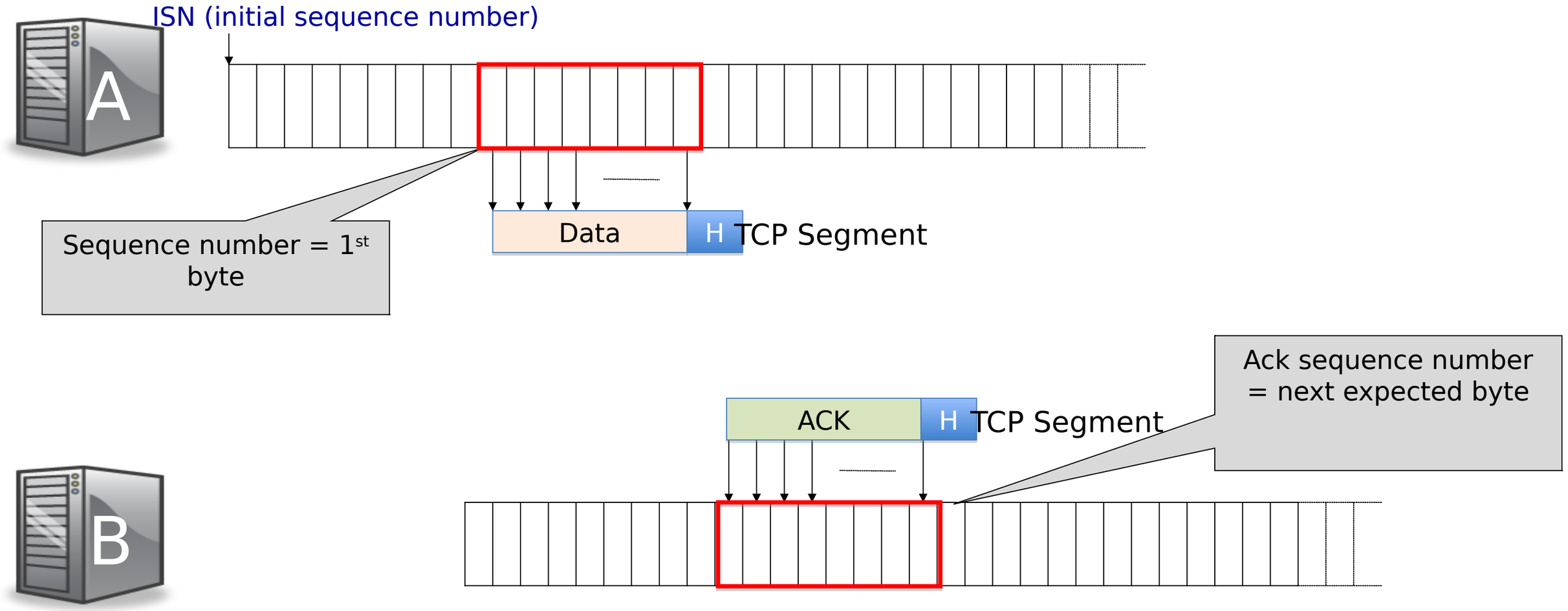


1. Host A increments source port for every new connection

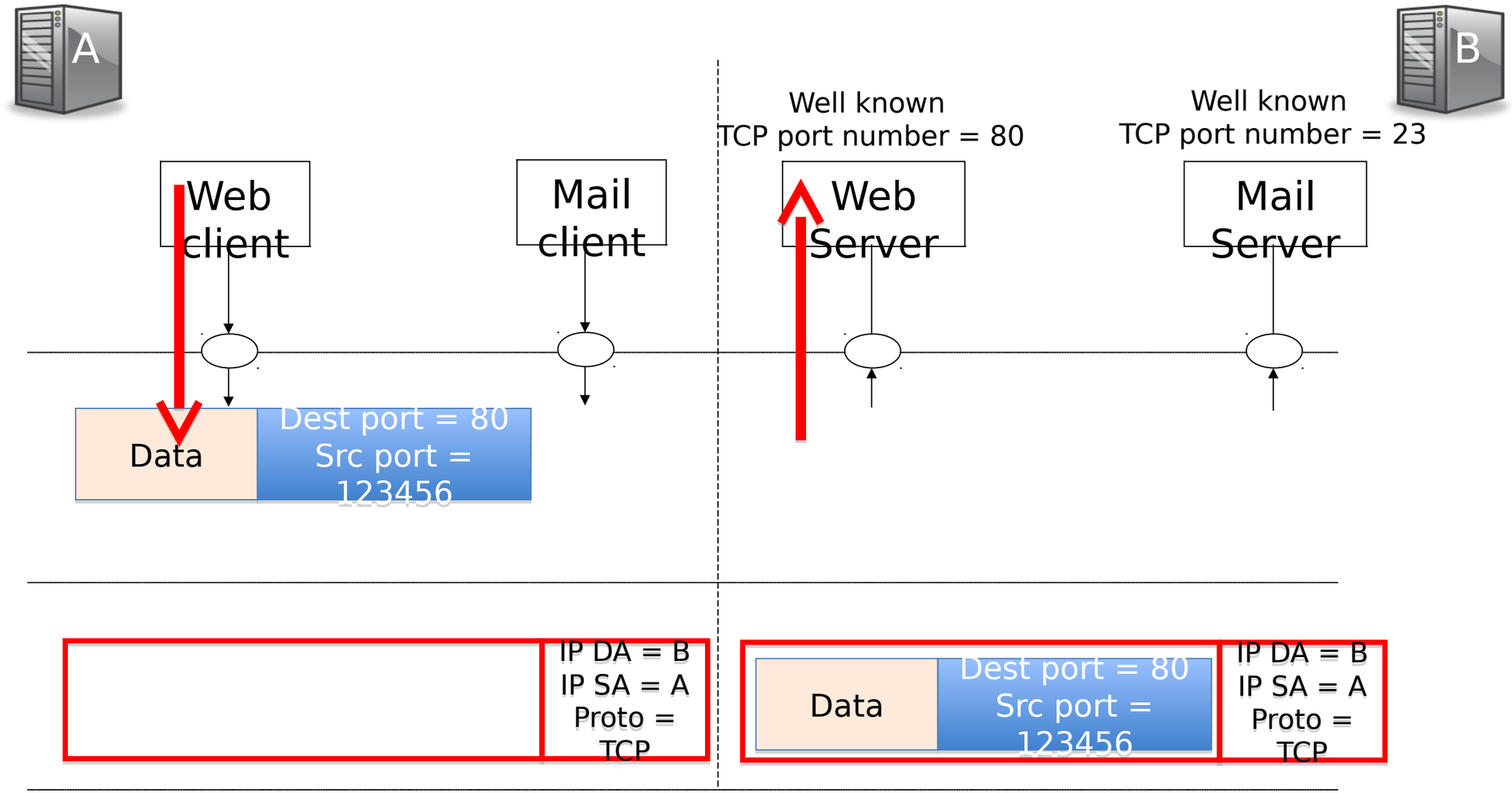
2. TCP picks ISN to avoid overlap with previous connection with same ID.



Sequence Numbers



TCP: Port Demultiplexing



TCP Sliding Window

You will learn about other TCP features in upcoming videos:

- Window-based flow control
- Retransmission and timeouts
- Congestion control

Summary

TCP provides in-order, reliable delivery of a stream of bytes between application processes.

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