

Physical and Data-Link Standards

LAN

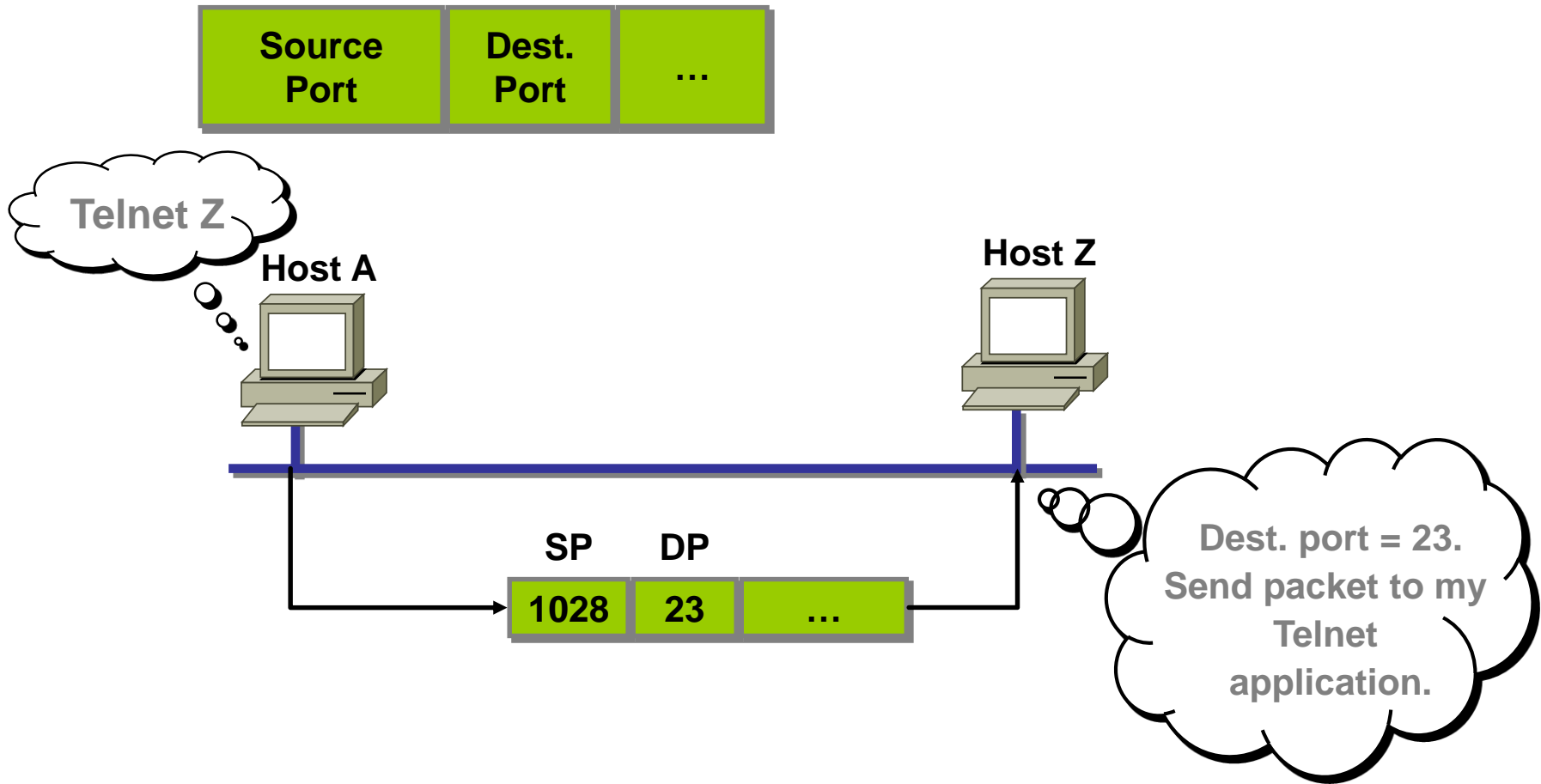
Data Link (frames)	802.2 LLC		
	E t h e r n e t	8 0 2 · 3	8 0 2 · 5 F D D I
Physical (bits, signals, clocking)			

WAN

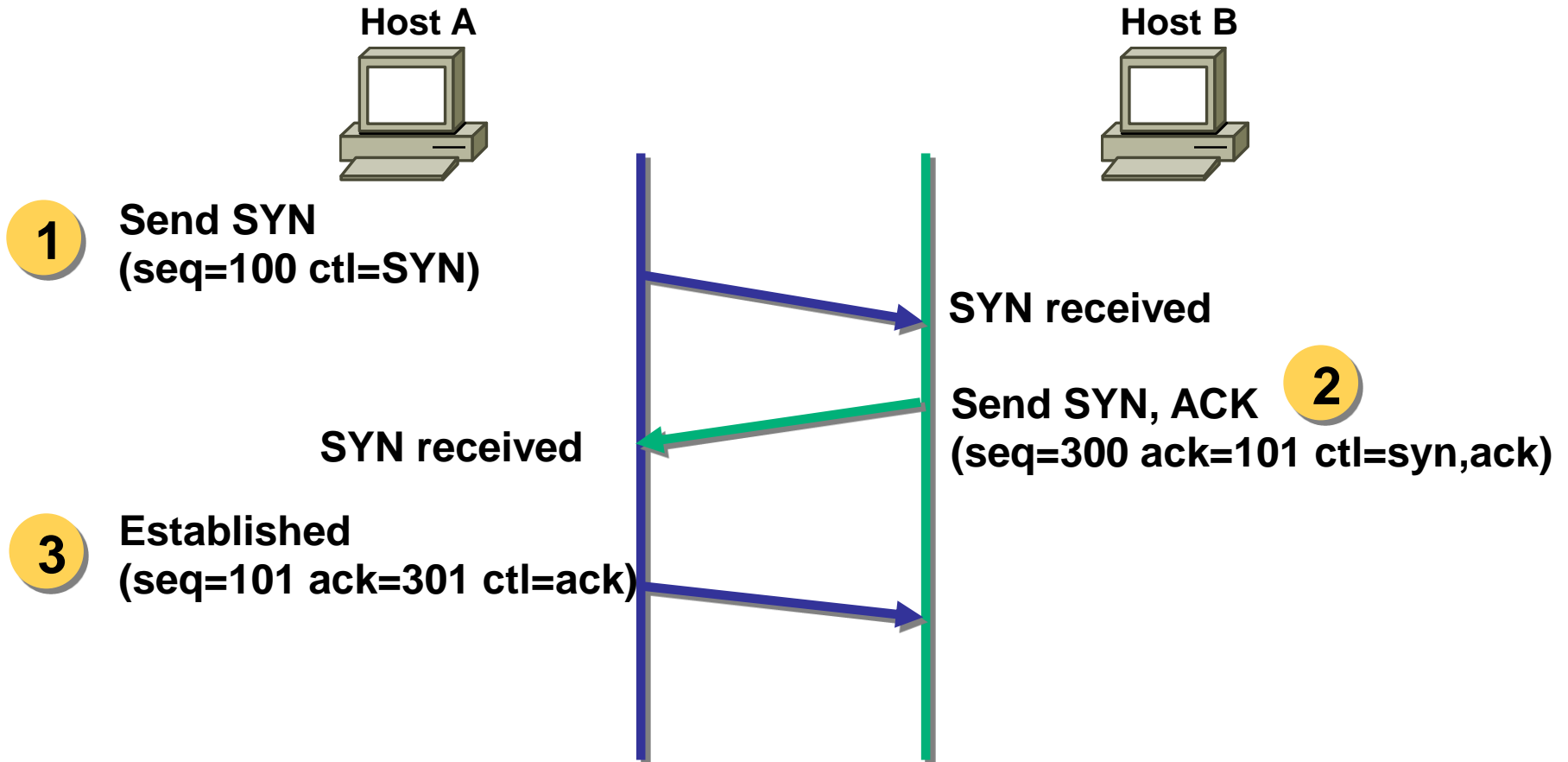
Dial on Demand	SDLC	HDLC	X.25 Link Frame Relay	ISDN PPP
V.24 EIA-530 V.35 EIA/TIA-232 G.703 EIA/TIA-449 HSSI				

- Separate physical and data link layers for LAN and WAN

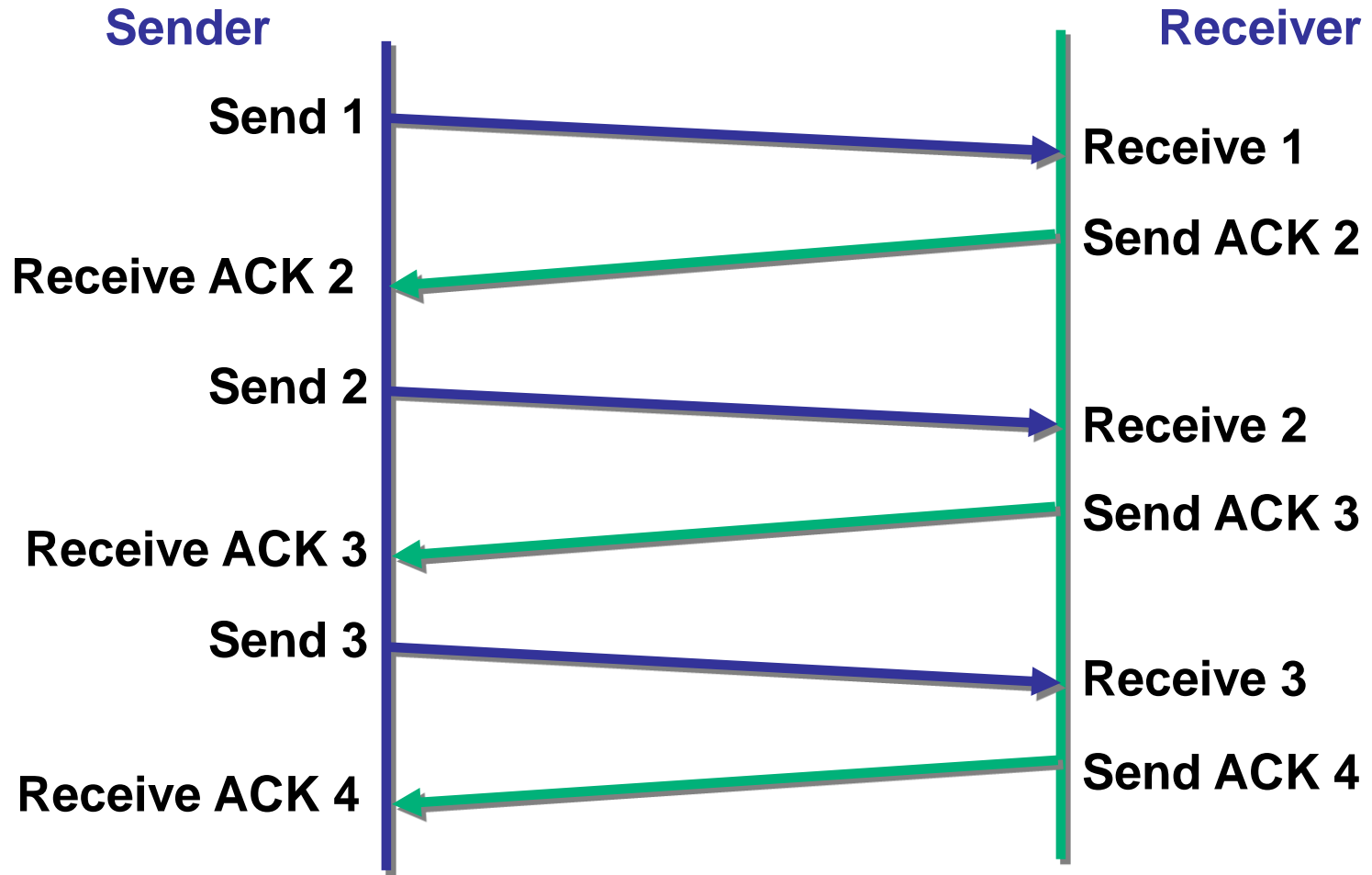
TCP Port Numbers



TCP Three Way Handshake

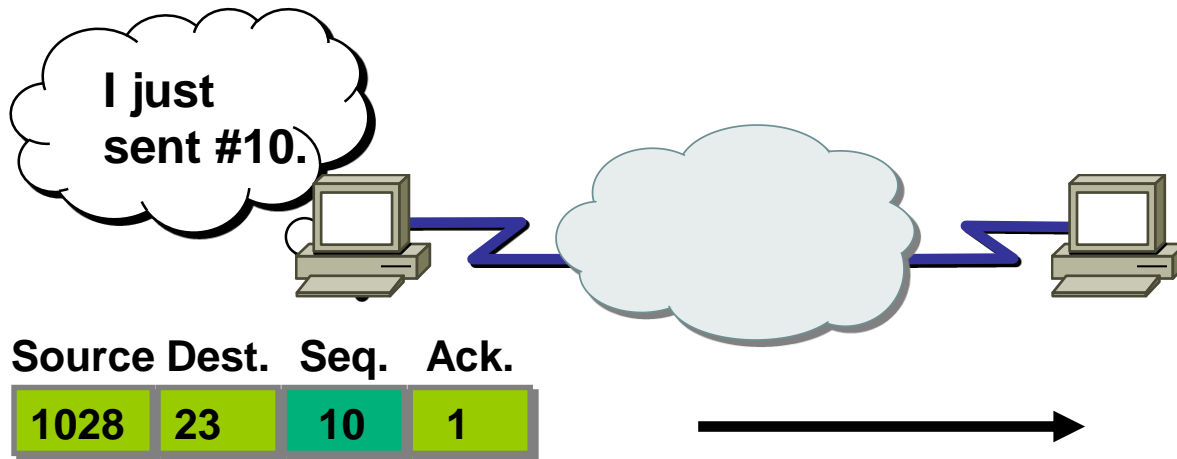


TCP Simple Acknowledgment



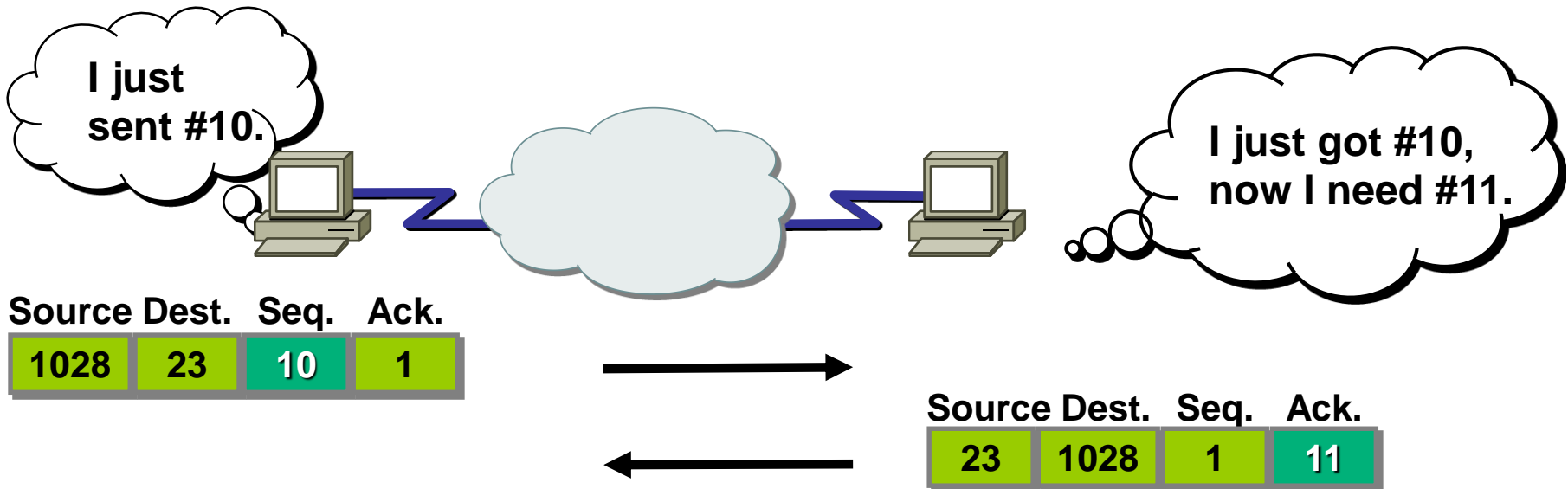
TCP Sequence and Acknowledgment Numbers

Source Port	Dest. Port	Sequence #	Acknowledgement #	...
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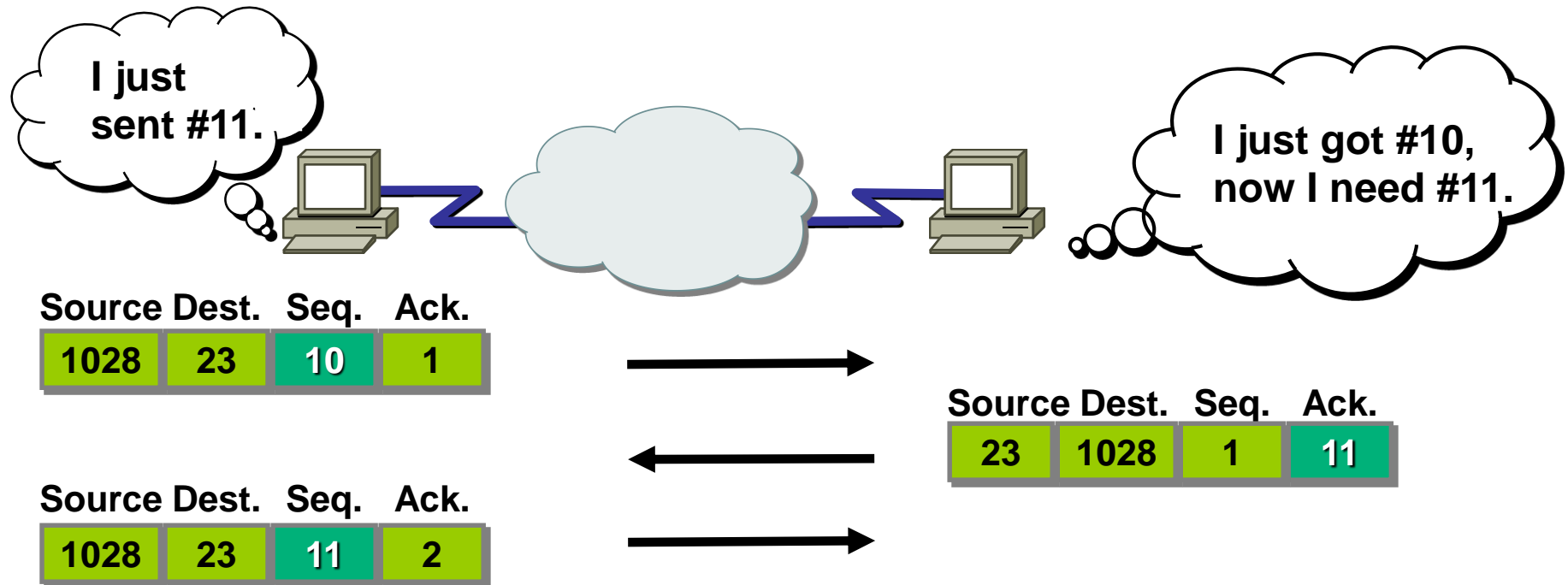
TCP Sequence and Acknowledgment Numbers

Source Port	Dest. Port	Sequence #	Acknowledgement #	...
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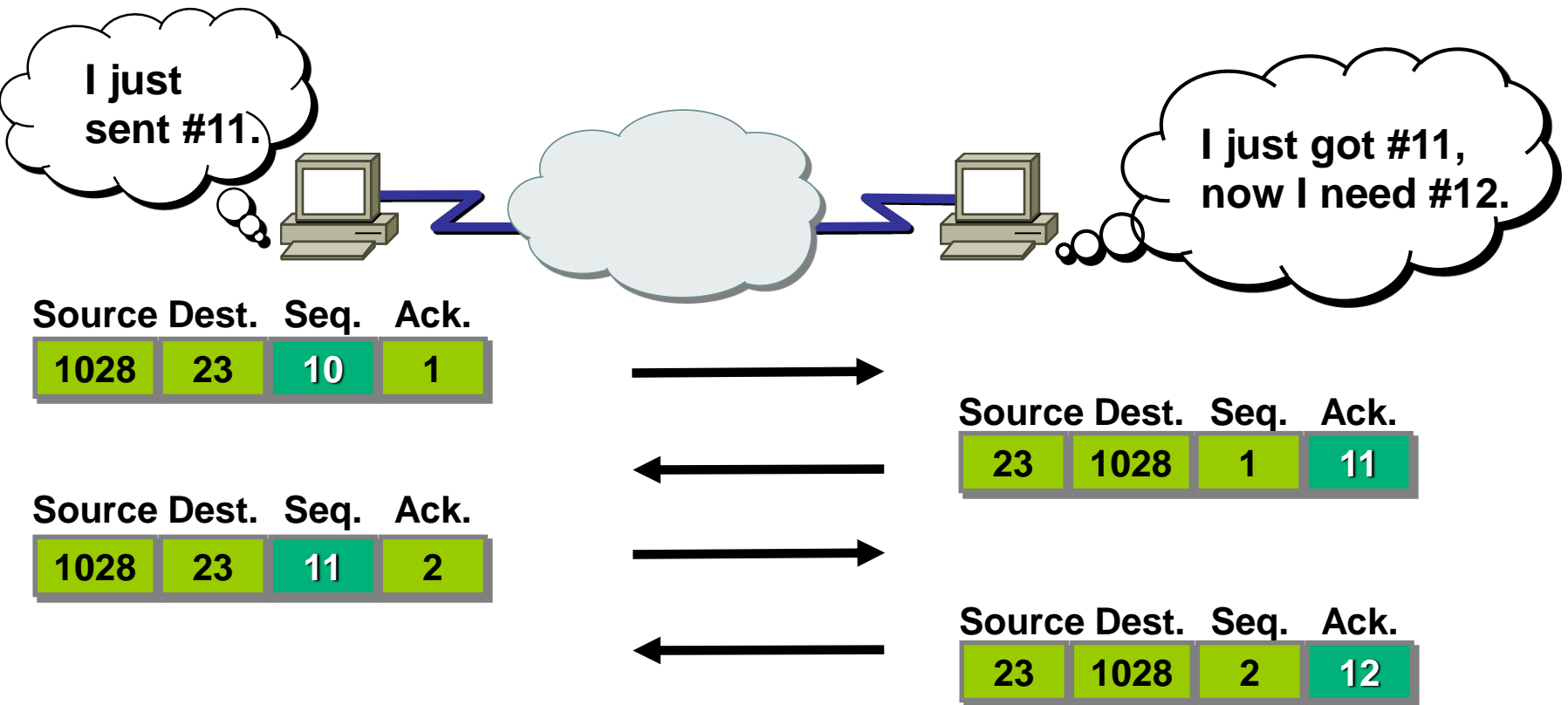
TCP Sequence and Acknowledgment Numbers

Source Port	Dest. Port	Sequence #	Acknowledgement #	...
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TCP Sequence and Acknowledgment Numbers

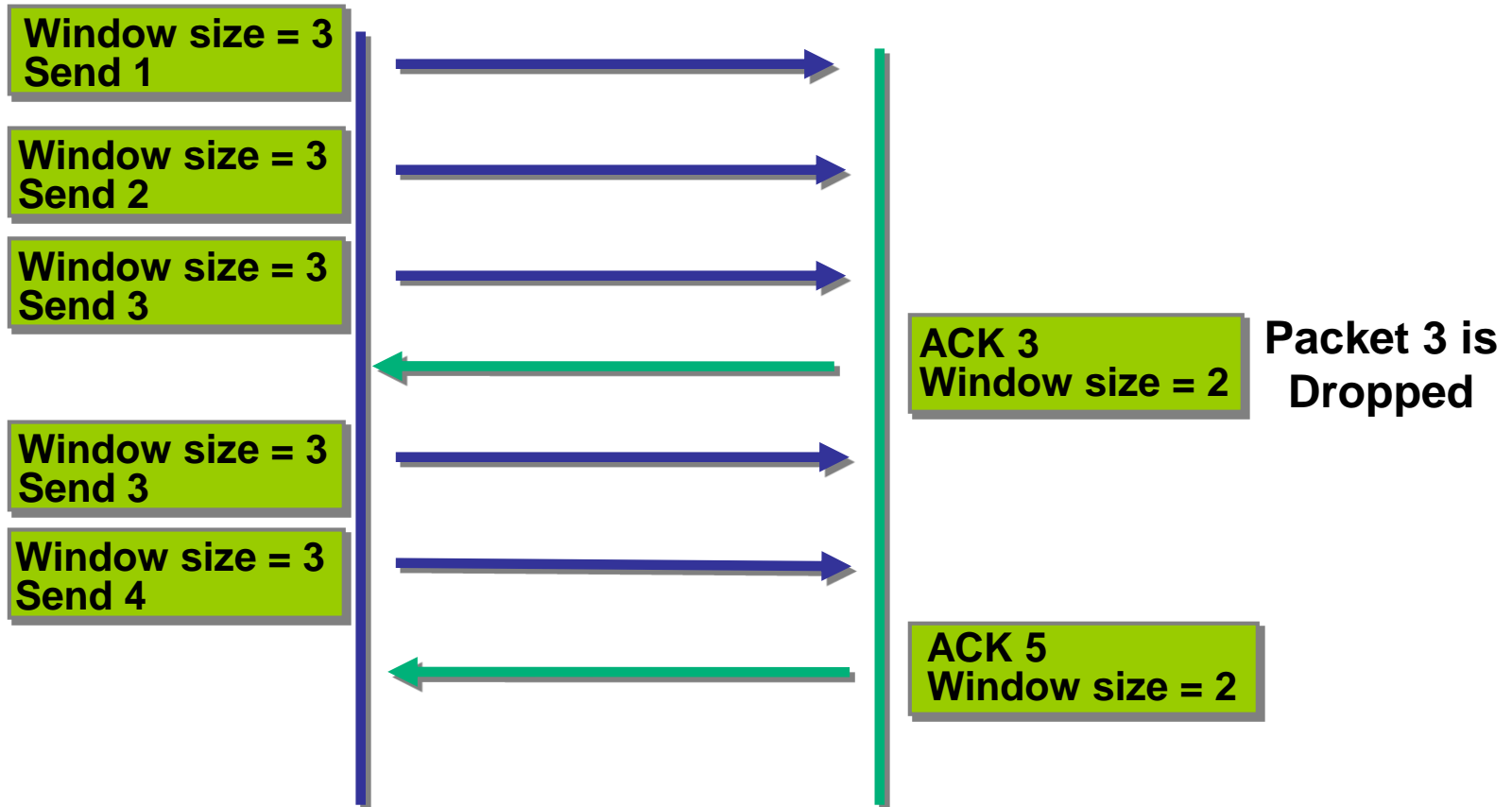
Source Port	Dest. Port	Sequence #	Acknowledgement #	...
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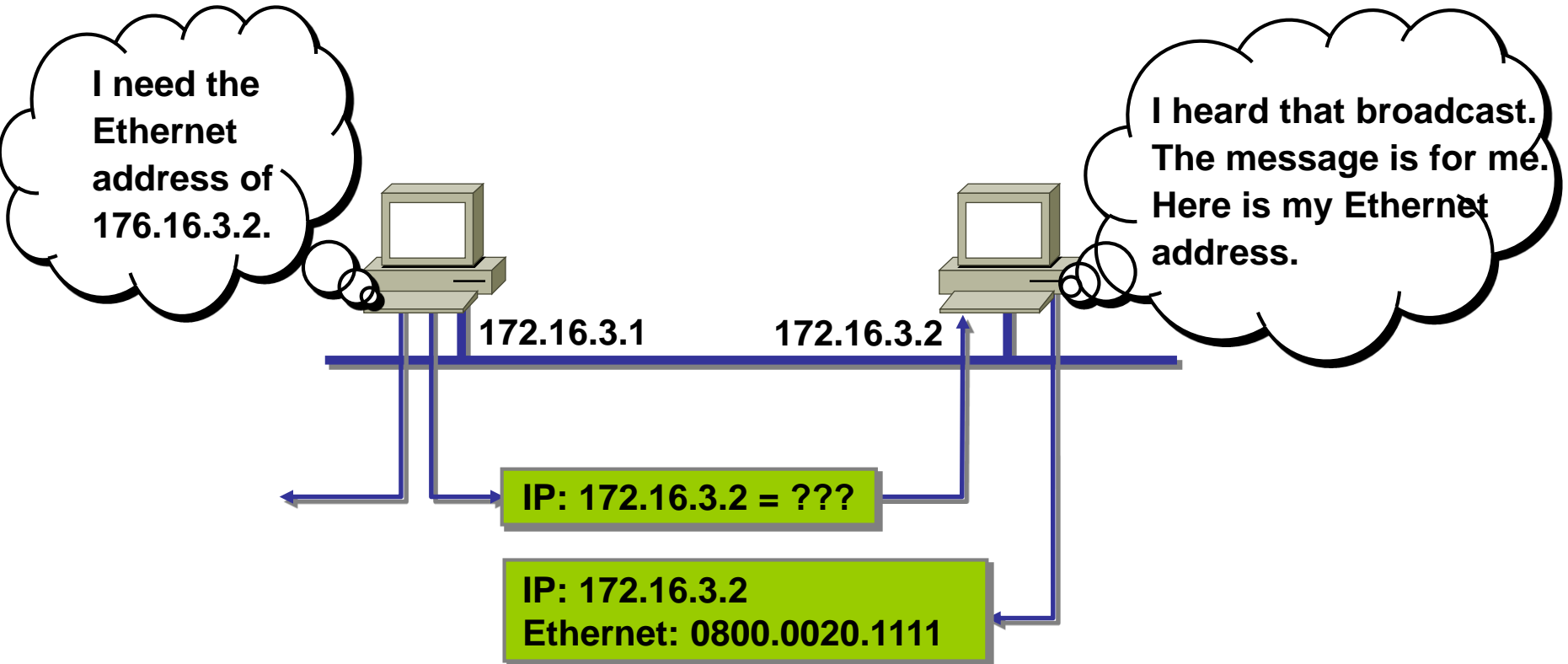
TCP Windowing

Sender

Receiver



Address Resolution Protocol



- Map IP → Ethernet