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Institut für Organisation und Management von
Informationssystemen

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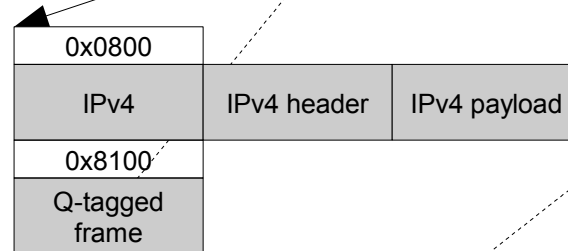
Lecture Computer Networks

Nachtrag

Ethernet Header (Ethernet II vs. 802.3)

7 octets	1 octet	6 octets	6 octets	2 octets	0/2 octets	- 1500 octets	4 octets	12 octets
Preamble 10101010	Start of frame 10101011	MAC dest. 48 bits	MAC src. 48 bits	Ethernet II type 802.3 length	optional 802.1q VLAN tag	payload	32 bit CRC	Interframe gap

Ethernet II



802.3 Ethernet

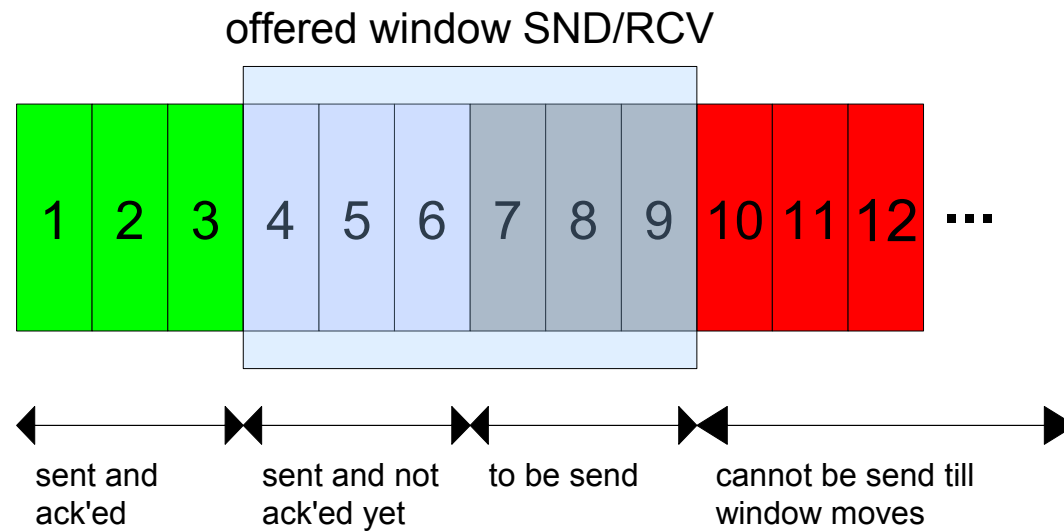


802.2 LLC SNAP

1 octet	1 octet	1 octet	5 octets	- 1492 octets
DSAP	SSAP	Control	SNAP	data
0xAA	0xAA	0x03	0x000000xxxx	data

Ethernet II type

TCP Sliding Window



xxx - Wireshark

File Edit View Go Capture Analyze Statistics Telephony Tools Help

Filter: Expression... Clear Apply

Source	Destination	Protocol	Info
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [SYN] Seq=0 Win=14600 Len=0 MSS=1460 SACK_PERM=1 TSV=4294941571 TSER=6
192.168.2.4	192.168.2.2	TCP	32123 > 55386 [SYN, ACK] Seq=0 Ack=1 Win=32806 Len=0 SACK_PERM=1 TSV=2296702 TSER=42
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [ACK] Seq=1 Ack=1 Win=14656 Len=0 TSV=4294941574 TSER=2296702
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [PSH, ACK] Seq=1 Ack=1 Win=14656 Len=24 TSV=4294941574 TSER=2296702
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [ACK] Seq=25 Ack=1 Win=14656 Len=2896 TSV=4294941574 TSER=2296702
192.168.2.4	192.168.2.2	TCP	32123 > 55386 [ACK] Seq=1 Ack=25 Win=1049792 Len=0 TSV=2296702 TSER=4294941574
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [ACK] Seq=2921 Ack=1 Win=14656 Len=2896 TSV=4294941574 TSER=2296702
192.168.2.4	192.168.2.2	TCP	32123 > 55386 [ACK] Seq=1 Ack=1473 Win=1049792 Len=0 TSV=2296702 TSER=4294941574
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [ACK] Seq=5817 Ack=1 Win=14656 Len=2896 TSV=4294941574 TSER=2296702
192.168.2.4	192.168.2.2	TCP	32123 > 55386 [ACK] Seq=1 Ack=4369 Win=1049792 Len=0 TSV=2296702 TSER=4294941574
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [ACK] Seq=8713 Ack=1 Win=14656 Len=4344 TSV=4294941574 TSER=2296702
192.168.2.4	192.168.2.2	TCP	32123 > 55386 [ACK] Seq=1 Ack=8713 Win=1049792 Len=0 TSV=2296702 TSER=4294941574
192.168.2.2	192.168.2.4	TCP	55386 > 32123 [PSH, ACK] Seq=13057 Ack=1 Win=14656 Len=5792 TSV=4294941574 TSER=2296

▶ Frame 2: 74 bytes on wire (592 bits), 74 bytes captured (592 bits)

▶ Ethernet II, Src: adria (00:27:0e:04:88:0e), Dst: alderaan (e0:69:95:4f:85:81)

▶ Internet Protocol, Src: 192.168.2.4 (192.168.2.4), Dst: 192.168.2.2 (192.168.2.2)

▼ Transmission Control Protocol, Src Port: 32123 (32123), Dst Port: 55386 (55386), Seq: 0, Ack: 1, Len: 0

Source port: 32123 (32123)

Destination port: 55386 (55386)

[Stream index: 0]

Sequence number: 0 (relative sequence number)

Acknowledgement number: 1 (relative ack number)

Header length: 40 bytes

▶ Flags: 0x12 (SYN, ACK)

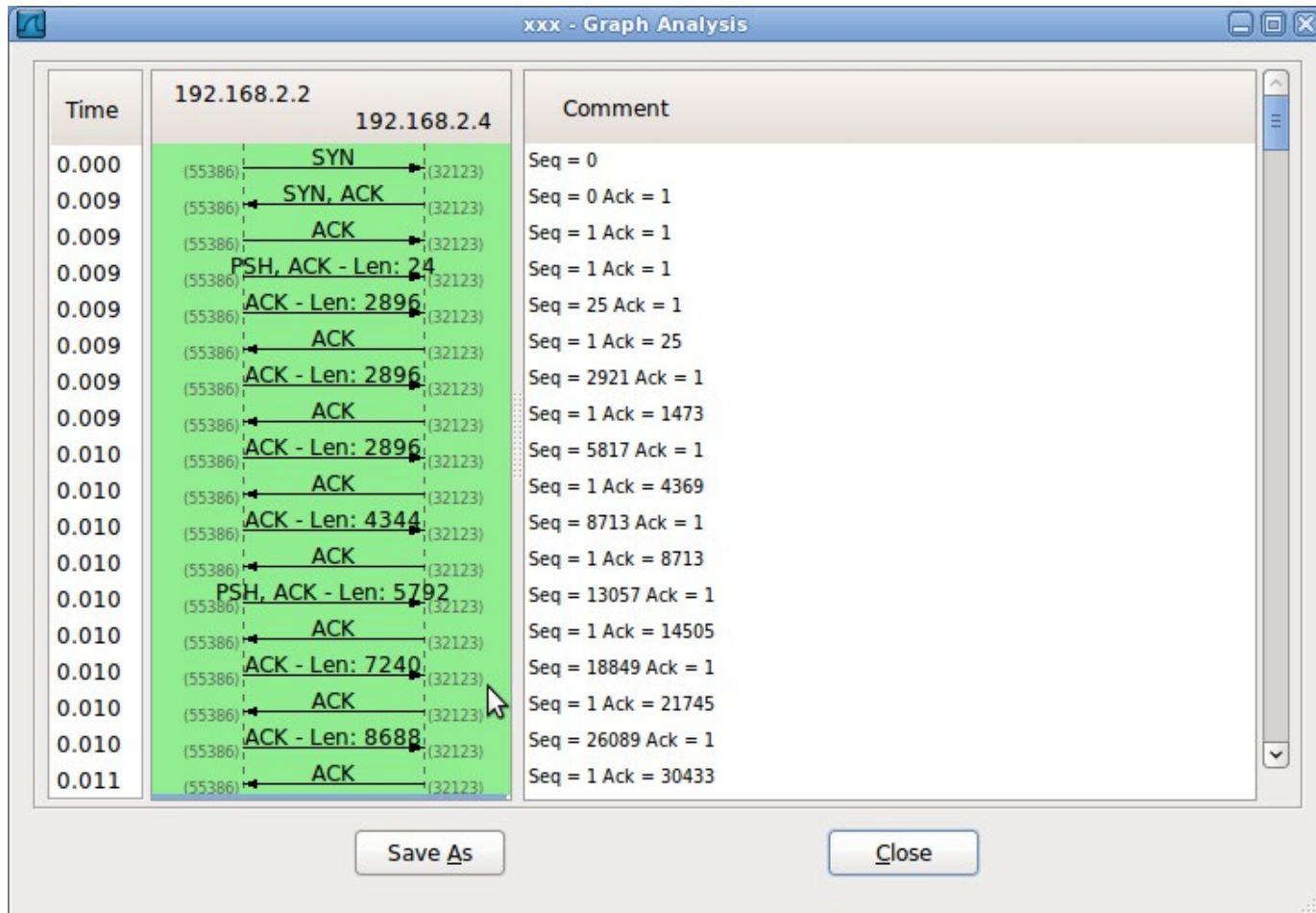
Window size: 32806

▶ Checksum: 0xe019 [validation disabled]

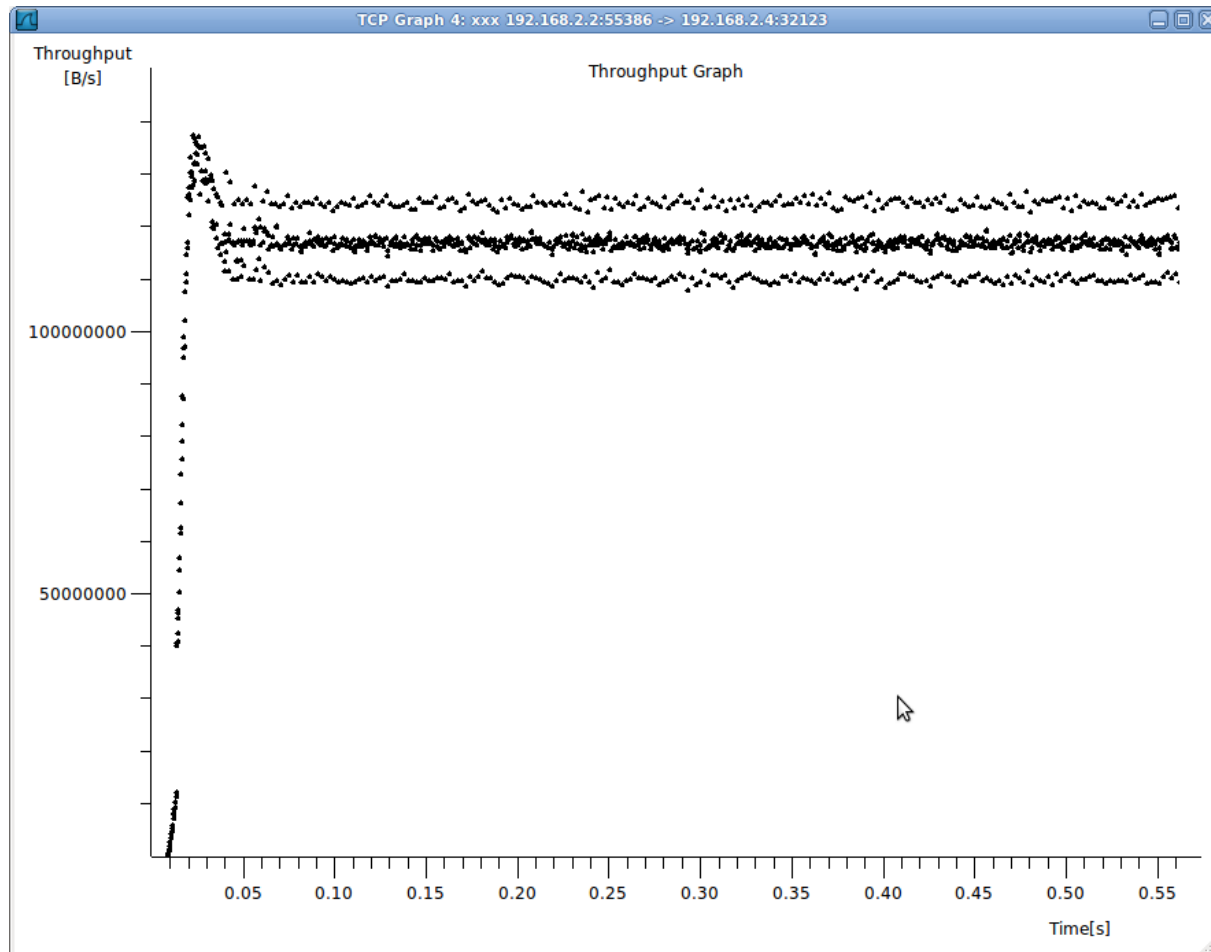
▼ Options: (20 bytes)

TCP SACK Permitted Option: True

TCP Flow



TCP Slow Start



Recommended Reading

