

Computer Networks

Lab Task #9

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20P-0051

Task

Question 1:

source port number: 60643
destination port number : 80

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▼ Transmission Control Protocol, Src Port: 60643, Dst Port: 80, Seq: 0, Len: 0
  Source Port: 60643
  Destination Port: 80
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Question 2:

Sequence number (raw): 2682012317
The segment is as a SYN segment because the SYN flag is set to 1.

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Sequence number: 0      (relative sequence number)
Sequence number (raw): 2682012317
[Next sequence number: 1      (relative sequence number)]
Acknowledgment number: 0
Acknowledgment number (raw): 0
1011 .... = Header Length: 44 bytes (11)
▼ Flags: 0x002 (SYN)
  000. .... = Reserved: Not set
  ...0 .... = Nonce: Not set
  .... 0... = Congestion Window Reduced (CWR): Not set
  .... .0.. = ECN-Echo: Not set
  .... ..0. = Urgent: Not set
  .... ...0 = Acknowledgment: Not set
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  ► .... .... ..1. = Syn: Set
  .... .... ...0 = Fin: Not set
```

Question 3:

The sequence number of the SYNACK segment sent by the server to the client computer in reply to the SYN is

Sequence number (raw): 349487776

The value of the Acknowledgement field in the SYNACK segment is:

Acknowledgment number (raw): 2682012318

The server determine that value in such a way that receiver take the sequence number from the sender and increment it by 1 and send it back to the sender as acknowledgement number.

The segment is as a SYN, ACK segment because the SYN, ACK flags are set to 1.

1	0.000000	192.168.1.122	64.238.147.113	TCP	78	60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793 TSecr=0 SACK_PERM=1
2	0.008010	64.238.147.113	192.168.1.122	TCP	74	80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM=1 TSval=4016893437 TSecr=256679793 WS=4
3	0.008000	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Len=0 TSval=256679881 TSecr=4016893437
4	0.008579	192.168.1.122	64.238.147.113	HTTP	257	GET /sigcomm/2011/papers/sigcomm/p2.pdf HTTP/1.1
5	0.177819	64.238.147.113	192.168.1.122	TCP	66	80 → 60643 [ACK] Seq=1 Ack=192 Win=6864 Len=0 TSval=4016893527 TSecr=256679881
6	0.178321	64.238.147.113	192.168.1.122	TCP	311	80 → 60643 [PSH, ACK] Seq=1 Ack=192 Win=6864 Len=245 TSval=4016893528 TSecr=256679881 [TCP segment of a reassembled PDU]
7	0.178388	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=246 Win=524280 Len=0 TSval=256679970 TSecr=4016893528
8	0.189114	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=246 Ack=192 Win=6864 Len=1368 TSval=4016893538 TSecr=256679881 [TCP segment of a reassembled PDU]
9	0.266705	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=1614 Ack=192 Win=6864 Len=1368 TSval=4016893615 TSecr=256679970 [TCP segment of a reassembled PDU]
10	0.266787	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=2982 Win=523944 Len=0 TSval=256680057 TSecr=4016893538
11	0.267657	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=2982 Ack=192 Win=6864 Len=1368 TSval=4016893615 TSecr=256679970 [TCP segment of a reassembled PDU]
12	0.354612	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=4350 Ack=192 Win=6864 Len=1368 TSval=4016893703 TSecr=256680057 [TCP segment of a reassembled PDU]
13	0.354647	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=5718 Win=523944 Len=0 TSval=256680144 TSecr=4016893615
14	0.355174	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=5718 Ack=192 Win=6864 Len=1368 TSval=4016893703 TSecr=256680057 [TCP segment of a reassembled PDU]
15	0.355561	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=7086 Ack=192 Win=6864 Len=1368 TSval=4016893703 TSecr=256680057 [TCP segment of a reassembled PDU]
16	0.355579	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=8454 Win=523944 Len=0 TSval=256680144 TSecr=4016893703
Frame 2: 74 bytes on wire (592 bits), 74 bytes captured (592 bits)						
Ethernet II, Src: Cisco-Li_e3:e9:8d (00:16:b6:e3:e9:8d), Dst: Apple-ac:6c:26 (10:9a:dd:ac:6c:26)						
Internet Protocol Version 4, Src: 64.238.147.113, Dst: 192.168.1.122						
Transmission Control Protocol, Src Port: 80, Dst Port: 60643, Seq: 0, Ack: 1, Len: 0						
Source Port: 80						
Destination Port: 60643						
[Stream index: 0]						
[TCP Segment Len: 0]						
Sequence number: 0 (relative sequence number)						
Sequence number (raw): 349487776						
[Next sequence number: 1 (relative sequence number)]						
Acknowledgment number: 1 (relative ack number)						
Acknowledgment number (raw): 2682012318						
1010 = Header Length: 40 bytes (10)						
Flags: 0x012 [SYN, ACK]						
000. = Reserved: Not set						
...0 = Nonce: Not set						
....0. = Congestion Window Reduced (CWR): Not set						
....0. = ECN-Echo: Not set						
....0. = Urgent: Not set						
....1. = Acknowledgment: Set						
....0. = Push: Not set						
....0. = Reset: Not set						
....1. = SYN: Set						
....0. = FIN: Not set						
[TCP Flags:A..S.]						

Question 4:

Segment 1 length = 191
Segment 2 length = 0
Segment 3 length = 245
Segment 4 length = 0
Segment 5 length = 1368
Segment 6 length = 1368

3	0.008000	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Len=0 TSval=256679881 TSecr=4016893437
4	0.008579	192.168.1.122	64.238.147.113	HTTP	257	GET /sigcomm/2011/papers/sigcomm/p2.pdf HTTP/1.1
5	0.177819	64.238.147.113	192.168.1.122	TCP	66	80 → 60643 [ACK] Seq=1 Ack=192 Win=6864 Len=0 TSval=4016893527 TSecr=256679881
6	0.178321	64.238.147.113	192.168.1.122	TCP	311	80 → 60643 [PSH, ACK] Seq=1 Ack=192 Win=6864 Len=245 TSval=4016893528 TSecr=256679881 [TCP segment of a reassembled PDU]
7	0.178388	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=246 Win=524280 Len=0 TSval=256679970 TSecr=4016893528
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10	0.266787	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=2982 Win=523944 Len=0 TSval=256680057 TSecr=4016893538
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12	0.354612	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643 [ACK] Seq=4350 Ack=192 Win=6864 Len=1368 TSval=4016893703 TSecr=256680057 [TCP segment of a reassembled PDU]
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16	0.355579	192.168.1.122	64.238.147.113	TCP	66	60643 → 80 [ACK] Seq=192 Ack=8454 Win=523944 Len=0 TSval=256680144 TSecr=4016893703

Frame 4: 257 bytes on wire (2056 bits), 257 bytes captured (2056 bits)

Ethernet II, Src: Apple-ac:6c:26 (10:9a:dd:ac:6c:26), Dst: Cisco-Li-e3:e9:8d (00:16:b6:e3:e9:8d)

Internet Protocol Version 4, Src: 192.168.1.122, Dst: 64.238.147.113

Transmission Control Protocol, Src Port: 60643, Dst Port: 80, Seq: 1, Ack: 1, Len: 191

Source Port: 60643

Destination Port: 80

[Stream index: 0]

[TCP Segment Len: 191]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 2682012318

[Next sequence number: 192 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Acknowledgment number (raw): 349487777

1000 = Header Length: 32 bytes (8)

Question 5:

No, there are no retransmitted segments in the trace file.