

Lab 10  
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[illegible]

## Lab Task:

1. What is the source and destination port numbers?

- Transmission Control Protocol, Src Port: 60643, Dst Port: 80, Seq: 0, Len: 0
  - Source Port: 60643
  - Destination Port: 80

2. What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection? What is it in the segment that identifies the segment as a SYN segment?

```
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 .... = Accurate ECN: Not set
    .... 0... = Congestion Window Reduced: 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
```

The sequence number of the TCP SYN segment is 1 since it is used to imitate the TCP connection between the client and receiver .

The Flags section, the Syn flag is set which indicates that this segment is a SYN segment.

3. What is the sequence number of the SYNACK segment sent by the server to the client computer in reply to the SYN? What is the value of the Acknowledgement field in the SYNACK segment? How did server determine that value? What is it in the segment that identifies the segment as a SYNACK segment?

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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 .... = Accurate ECN: Not set
  .... 0... = Congestion Window Reduced: 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

```

The sequence number of the SYNACK segment sent by server to the client computer in reply to the SYN is 1.

The value of the acknowledgement field in the SYNACK segment is 1. The value of the Acknowledgement field in the SYNACK segment is determined by the server.

The server adds 1 to the initial sequence number of SYN segment from the client computer.

For this case, the initial sequence number of SYN segment from the client computer is 0, thus the value of the ACKnowledgement field in the SYNACK segment is 1. A segment will be identified as a SYNACK segment if both SYN flag and Acknowledgement in the segment are set to 1.

4. What is the length of each of the first six TCP segments?

Seq	Source	Destination	Protocol	Length	Flags	Sequence Number	Acknowledgment Number	Window	Length	TSval
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=4		
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			
7	0.178388	192.168.1.122	64.238.147.113	TCP	66	60643 → 80	[ACK] Seq=192 Ack=246 Win=524280 Len=0	TSv		
8	0.189114	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643	[ACK] Seq=246 Ack=192 Win=6864 Len=1368	TS		
9	0.266705	64.238.147.113	192.168.1.122	TCP	1434	80 → 60643	[ACK] Seq=1614 Ack=192 Win=6864 Len=1368	T		
10	0.266787	192.168.1.122	64.238.147.113	TCP	66	60643 → 80	[ACK] Seq=192 Ack=2982 Win=523944 Len=0	TS		

The length of the first TCP segment is 0 bytes, the length of the second TCP segment is 245 bytes.

The length of the 3<sup>rd</sup> TCP segment is 0 bytes, the length of the 4<sup>th</sup>, 5<sup>th</sup> TCP segment is 1368 bytes and 6<sup>th</sup> 0 bytes.

5. Are there any retransmitted segments in the trace file? What did you check for (in the trace) in order to answer this question?

tcp.analysis.fast_retransmission						
No.	Time	Source	Destination	Protocol	Length	Info

There is no retransmitted segments in the trace file .