# Computer Networks Lab Task – 9

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Roll No: 20P-0563

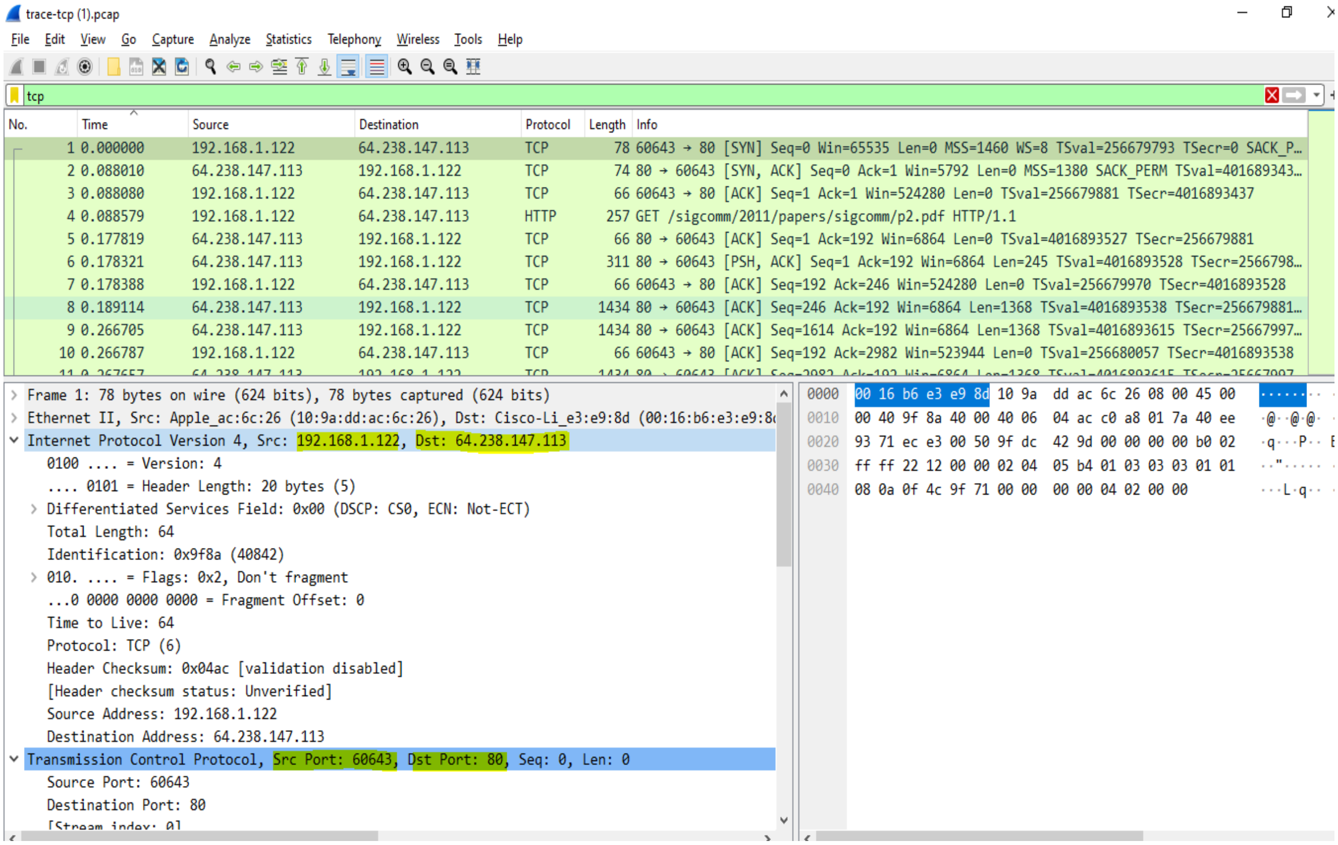
Name: Mahad Ashraf

Section: B

# Lab Task: Inspect the three-way handshake and answer the following questions

1. **What is the source and destination port numbers?**

   Solution: Client computer (source) IP address: 192.168.1.122
   TCP port number: 60643
   Destination computer: IP address: 64.238.147.113
   TCP port number: 80



tcp

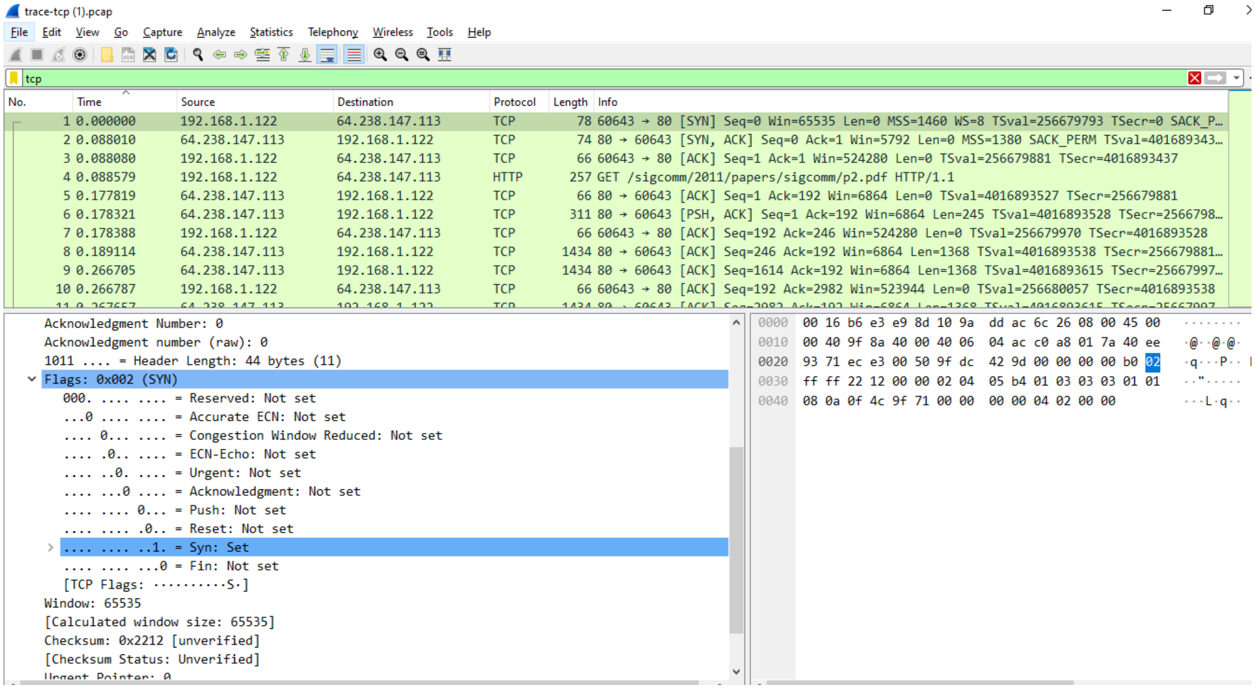
| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 1 | 0.000000 | 192.168.1.122 | 64.238.147.113 | TCP | 78 | 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793 TSecr=0 SACK_P… |
| 2 | 0.088010 | 64.238.147.113 | 192.168.1.122 | TCP | 74 | 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM TSval=401689343… |
| 3 | 0.088080 | 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 | 0.088579 | 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=2566798… |
| 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… |
| 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=25667997… |
| 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=25667997 |

```
> Frame 1: 78 bytes on wire (624 bits), 78 bytes captured (624 bits)
> Ethernet II, Src: Apple_ac:6c:26 (10:9a:dd:ac:6c:26), Dst: Cisco-Li_e3:e9:8d (00:16:b6:e3:e9:8
v Internet Protocol Version 4, Src: 192.168.1.122, Dst: 64.238.147.113
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 64
    Identification: 0x9f8a (40842)
  > 010. .... = Flags: 0x2, Don't fragment
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 64
    Protocol: TCP (6)
    Header Checksum: 0x04ac [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.1.122
    Destination Address: 64.238.147.113
v Transmission Control Protocol, Src Port: 60643, Dst Port: 80, Seq: 0, Len: 0
    Source Port: 60643
    Destination Port: 80
    [Stream index: 0]
```

```
0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ········
0010  00 40 9f 8a 40 00 40 06  04 ac c0 a8 01 7a 40 ee   ·@··@·@·
0020  93 71 ec e3 00 50 9f dc  42 9d 00 00 00 00 b0 02   ·q···P··
0030  ff ff 22 12 00 00 02 04  05 b4 01 03 03 03 01 01   ··"·····
0040  08 0a 0f 4c 9f 71 00 00  00 00 04 02 00 00         ···L·q··
```

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?**

Solution: Sequence number of the TCP SYN segment is used to initiate the TCP connection between the client computer and destination: 64.238.147.113. The value is 0 in this trace.
The SYN flag is set to 1 and it indicates that this segment is a SYN segment.


trace-tcp (1).pcap
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tcp

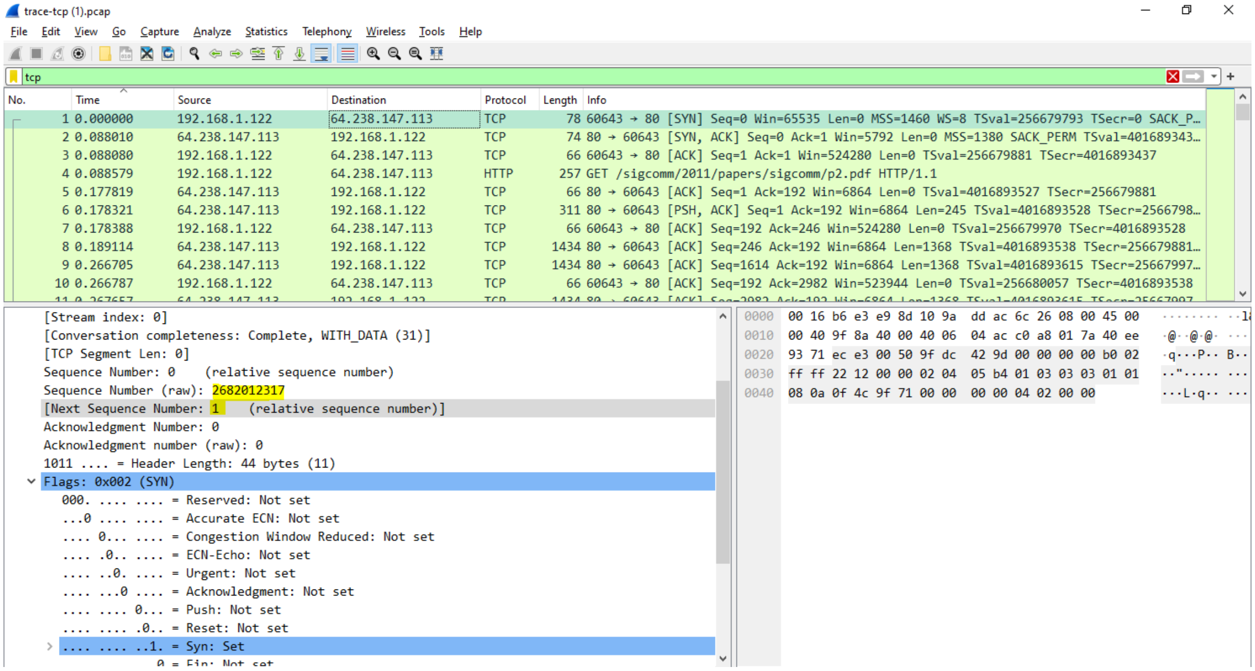
| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 1 | 0.000000 | 192.168.1.122 | 64.238.147.113 | TCP | 78 | 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793 TSecr=0 SACK_P… |
| 2 | 0.088010 | 64.238.147.113 | 192.168.1.122 | TCP | 74 | 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM TSval=401689343… |
| 3 | 0.088080 | 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 | 0.088579 | 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=2566798… |
| 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… |
| 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=25667997… |
| 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=25667997 |

```
    Acknowledgment Number: 0
    Acknowledgment number (raw): 0
    1011 .... = Header Length: 44 bytes (11)
  v 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
      .... .... ...0 = Fin: Not set
      [TCP Flags: ··········S·]
    Window: 65535
    [Calculated window size: 65535]
    Checksum: 0x2212 [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
```

```
0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ········
0010  00 40 9f 8a 40 00 40 06  04 ac c0 a8 01 7a 40 ee   ·@··@·@·
0020  93 71 ec e3 00 50 9f dc  42 9d 00 00 00 00 b0 02   ·q···P··
0030  ff ff 22 12 00 00 02 04  05 b4 01 03 03 03 01 01   ··"·····
0040  08 0a 0f 4c 9f 71 00 00  00 00 04 02 00 00         ···L·q··
```

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?**

Solution: Sequence number of the SYNACK segment from destination to the client computer in reply to the SYN has the value of 0 in this trace. 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 destination by adding 1 to the initial sequence number of SYN segment from the client computer (i.e. the sequence number of the SYN segment initiated by the client computer is 0.). The SYN flag and Acknowledgement flag in the segment are set to 1 and they indicate that this segment is a SYNACK segment


trace-tcp (1).pcap
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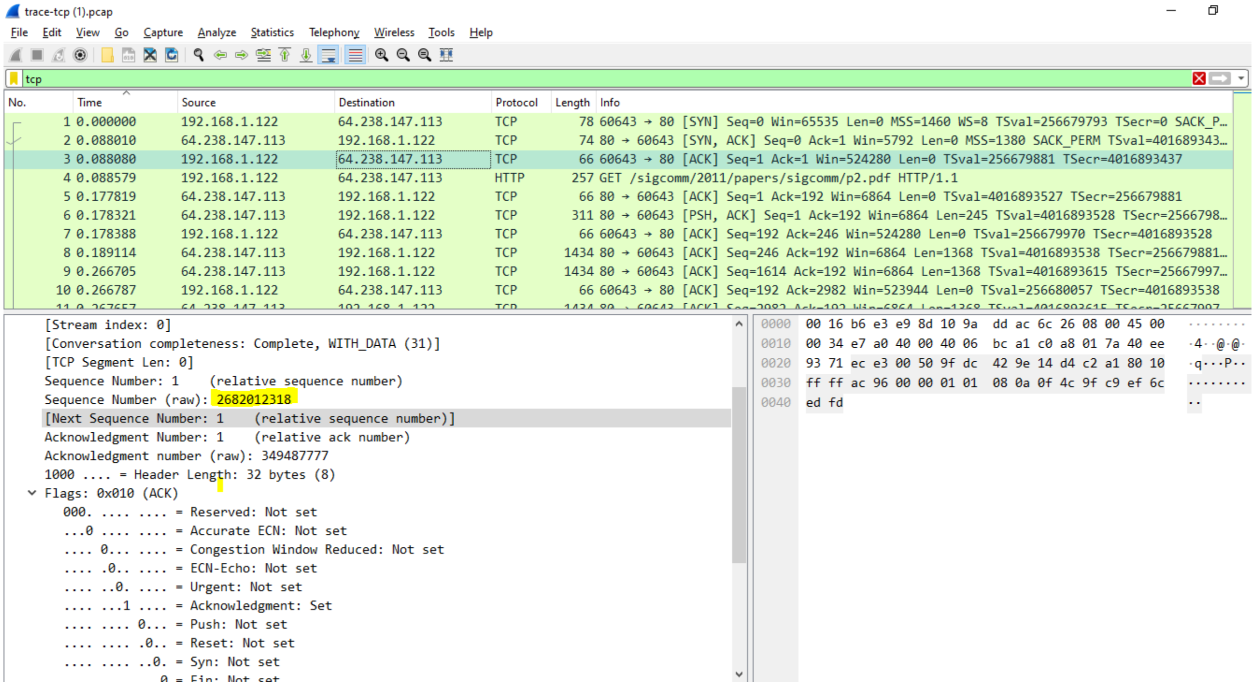
tcp

```
No.   Time       Source          Destination     Protocol Length Info
    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_P…
    2 0.088010   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 TSval=401689343…
    3 0.088080   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 0.088579   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=2566798…
    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…
    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=25667997…
   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
```

```
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 0]
    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)
  v 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
```

```
0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ........ ..l
0010  00 40 9f 8a 40 00 40 06  04 ac c0 a8 01 7a 40 ee   .@..@.@. ...
0020  93 71 ec e3 00 50 9f dc  42 9d 00 00 00 00 b0 02   .q...P.. B..
0030  ff ff 22 12 00 00 02 04  05 b4 01 03 03 03 01 01   .."..... ...
0040  08 0a 0f 4c 9f 71 00 00  00 00 04 02 00 00         ...L.q.. ...
```



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tcp

```
No.   Time       Source           Destination      Protocol  Length Info
    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_P…
    2 0.088010   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 TSval=401689343…
    3 0.088080   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
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    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…
    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=25667997…
   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=25667997
```
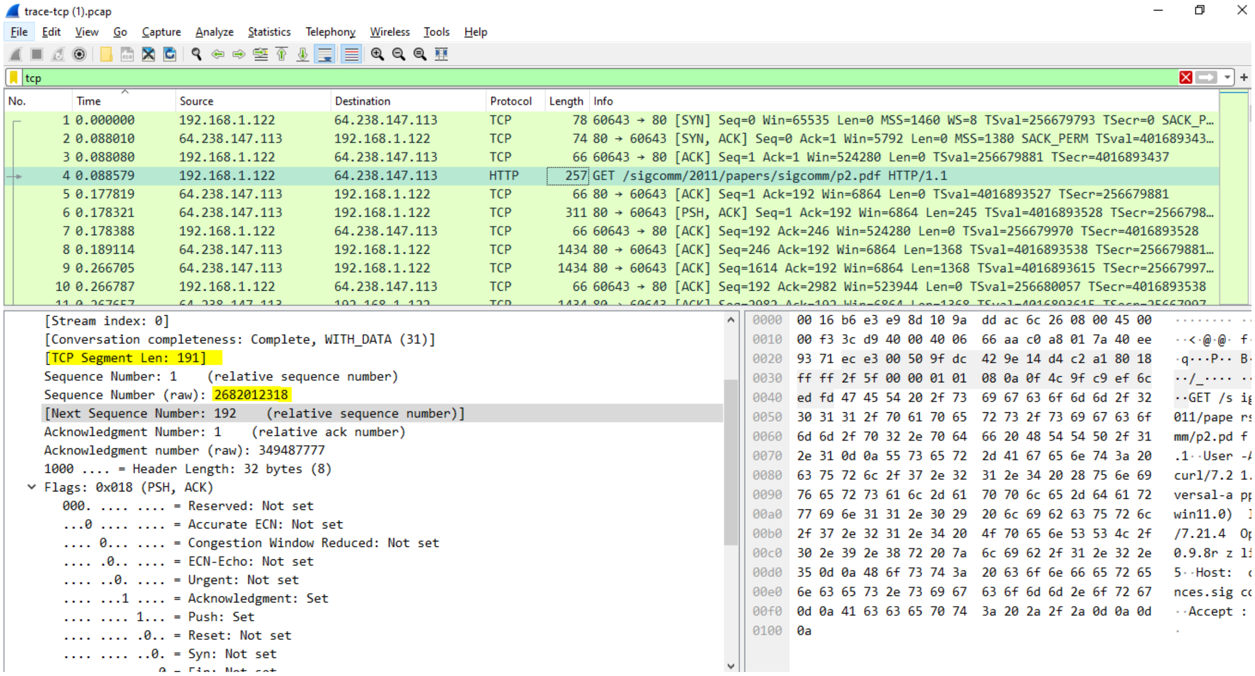

```
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 0]
    Sequence Number: 1    (relative sequence number)
    Sequence Number (raw): 2682012318
    [Next Sequence Number: 1    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 349487777
    1000 .... = Header Length: 32 bytes (8)
  ⌄ Flags: 0x010 (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
      .... .... ..0. = Syn: Not set
                  0 = Fin: Not set
```

```
0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ········
0010  00 34 e7 a0 40 00 40 06  bc a1 c0 a8 01 7a 40 ee   ·4··@·@·
0020  93 71 ec e3 00 50 9f dc  42 9e 14 d4 c2 a1 80 10   ·q···P··
0030  ff ff ac 96 00 00 01 01  08 0a 0f 4c 9f c9 ef 6c   ········
0040  ed fd                                              ··
```



trace-tcp (1).pcap
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tcp

```
No.   Time       Source           Destination      Protocol  Length Info
    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_P…
    2 0.088010   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 TSval=401689343…
    3 0.088080   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 0.088579   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=2566798…
    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…
    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=25667997…
   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=25667997
```

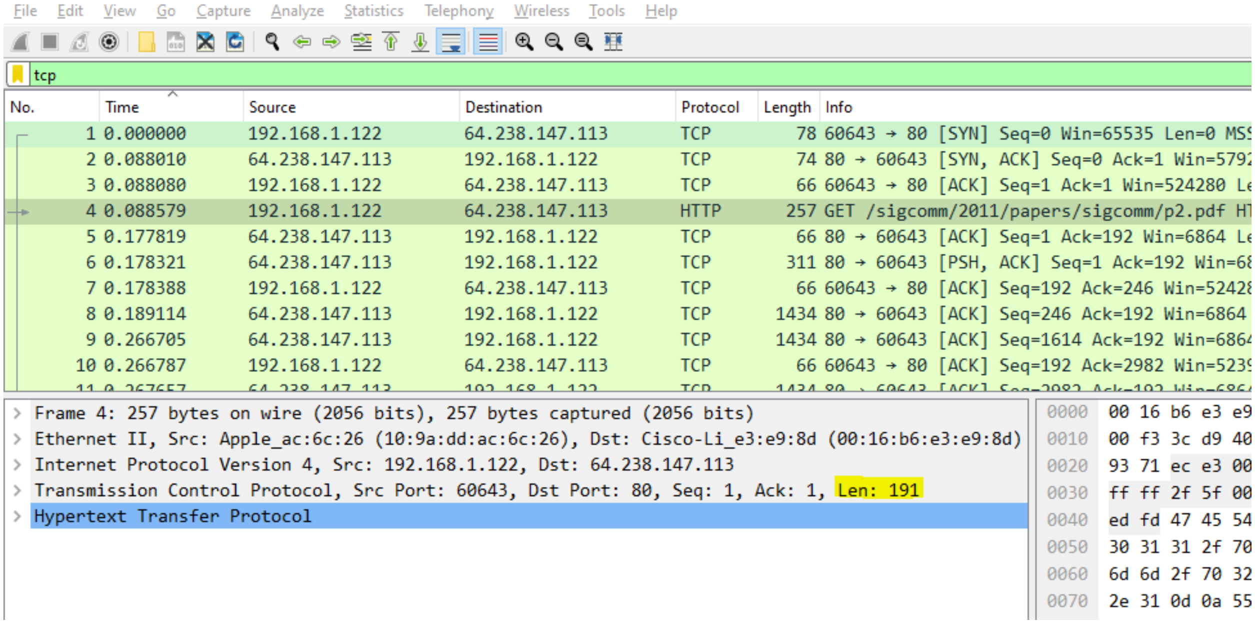
```
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 191]
    Sequence Number: 1    (relative sequence number)
    Sequence Number (raw): 2682012318
    [Next Sequence Number: 192    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 349487777
    1000 .... = Header Length: 32 bytes (8)
  ⌄ Flags: 0x018 (PSH, 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
      .... .... 1... = Push: Set
      .... .... .0.. = Reset: Not set
      .... .... ..0. = Syn: Not set
                  0 = Fin: Not set
```

```
0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ········ ··
0010  00 f3 3c d9 40 00 40 06  66 aa c0 a8 01 7a 40 ee   ··<·@·@· f·
0020  93 71 ec e3 00 50 9f dc  42 9e 14 d4 c2 a1 80 18   ·q···P·· B·
0030  ff ff 2f 5f 00 00 01 01  08 0a 0f 4c 9f c9 ef 6c   ··/_···· ··
0040  ed fd 47 45 54 20 2f 73  69 67 63 6f 6d 6d 2f 32   ··GET /s ig
0050  30 31 31 2f 70 61 70 65  72 73 2f 73 69 67 63 6f   011/pape rs
0060  6d 6d 2f 70 32 2e 70 64  66 20 48 54 54 50 2f 31   mm/p2.pd f
0070  2e 31 0d 0a 55 73 65 72  2d 41 67 65 6e 74 3a 20   .1··User -A
0080  63 75 72 6c 2f 37 2e 32  31 2e 34 20 28 75 6e 69   curl/7.2 1.
0090  76 65 72 73 61 6c 2d 61  70 70 6c 65 2d 64 61 72   versal-a pp
00a0  77 69 6e 31 31 2e 30 29  20 6c 69 62 63 75 72 6c   win11.0)  l
00b0  2f 37 2e 32 31 2e 34 20  4f 70 65 6e 53 53 4c 2f   /7.21.4  Op
00c0  30 2e 39 2e 38 72 20 7a  6c 69 62 2f 31 2e 32 2e   0.9.8r z li
00d0  35 0d 0a 48 6f 73 74 3a  20 63 6f 6e 66 65 72 65   5··Host:  c
00e0  6e 63 65 73 2e 73 69 67  63 6f 6d 6d 2e 6f 72 67   nces.sig co
00f0  0d 0a 41 63 63 65 70 74  3a 20 2a 2f 2a 0d 0a 0d   ··Accept :
0100  0a                                                 ·
```

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

Solution:

Length of first TCP segment: 191

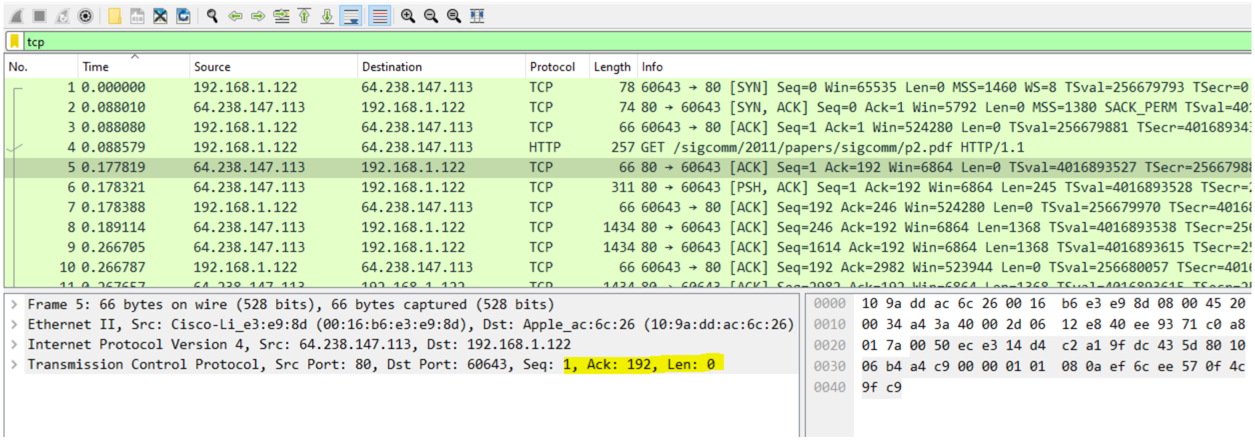


```
No.    Time       Source            Destination       Protocol  Length  Info
     1 0.000000   192.168.1.122     64.238.147.113    TCP         78 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS
     2 0.088010   64.238.147.113    192.168.1.122     TCP         74 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792
     3 0.088080   192.168.1.122     64.238.147.113    TCP         66 60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Le
     4 0.088579   192.168.1.122     64.238.147.113    HTTP       257 GET /sigcomm/2011/papers/sigcomm/p2.pdf HT
     5 0.177819   64.238.147.113    192.168.1.122     TCP         66 80 → 60643 [ACK] Seq=1 Ack=192 Win=6864 Le
     6 0.178321   64.238.147.113    192.168.1.122     TCP        311 80 → 60643 [PSH, ACK] Seq=1 Ack=192 Win=68
     7 0.178388   192.168.1.122     64.238.147.113    TCP         66 60643 → 80 [ACK] Seq=192 Ack=246 Win=52428
     8 0.189114   64.238.147.113    192.168.1.122     TCP       1434 80 → 60643 [ACK] Seq=246 Ack=192 Win=6864
     9 0.266705   64.238.147.113    192.168.1.122     TCP       1434 80 → 60643 [ACK] Seq=1614 Ack=192 Win=6864
    10 0.266787   192.168.1.122     64.238.147.113    TCP         66 60643 → 80 [ACK] Seq=192 Ack=2982 Win=5239
```

```
> 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
> Hypertext Transfer Protocol
```

```
0000  00 16 b6 e3 e9
0010  00 f3 3c d9 40
0020  93 71 ec e3 00
0030  ff ff 2f 5f 00
0040  ed fd 47 45 54
0050  30 31 31 2f 70
0060  6d 6d 2f 70 32
0070  2e 31 0d 0a 55
```

Length of Second TCP segment: 0

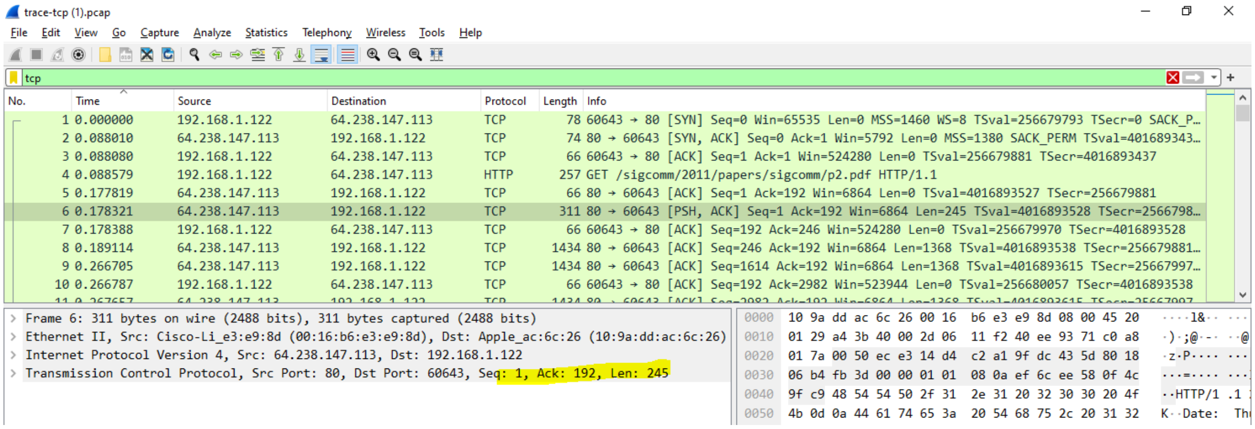


```
No.    Time       Source            Destination       Protocol  Length  Info
     1 0.000000   192.168.1.122     64.238.147.113    TCP         78 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793 TSecr=0
     2 0.088010   64.238.147.113    192.168.1.122     TCP         74 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM TSval=40
     3 0.088080   192.168.1.122     64.238.147.113    TCP         66 60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Len=0 TSval=256679881 TSecr=40168934
     4 0.088579   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=2566798
     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=
     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=4016
     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=25
     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=2
    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=401
```

```
> Frame 5: 66 bytes on wire (528 bits), 66 bytes captured (528 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: 1, Ack: 192, Len: 0
```

```
0000  10 9a dd ac 6c 26 00 16  b6 e3 e9 8d 08 00 45 20
0010  00 34 a4 3a 40 00 2d 06  12 e8 40 ee 93 71 c0 a8
0020  01 7a 00 50 ec e3 14 d4  c2 a1 9f dc 43 5d 80 10
0030  06 b4 a4 c9 00 00 01 01  08 0a ef 6c ee 57 0f 4c
0040  9f c9
```

Length of Third TCP segment: 245

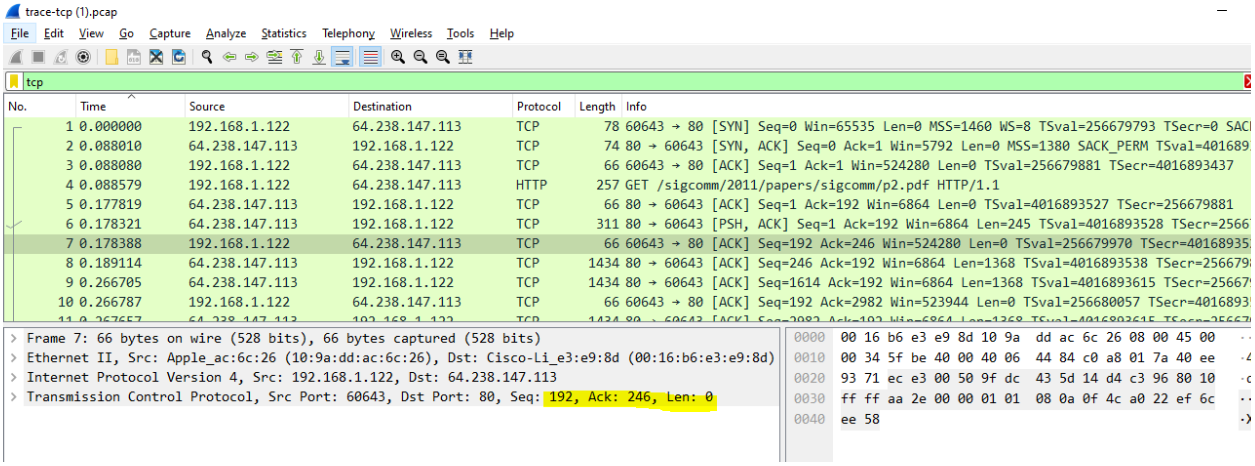


```
No.    Time       Source            Destination       Protocol  Length  Info
     1 0.000000   192.168.1.122     64.238.147.113    TCP         78 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793 TSecr=0 SACK_P…
     2 0.088010   64.238.147.113    192.168.1.122     TCP         74 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM TSval=401689343…
     3 0.088080   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 0.088579   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=2566798…
     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…
     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=25667997…
    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
```

```
> Frame 6: 311 bytes on wire (2488 bits), 311 bytes captured (2488 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: 1, Ack: 192, Len: 245
```

```
0000  10 9a dd ac 6c 26 00 16  b6 e3 e9 8d 08 00 45 20   ····l&·· ···
0010  01 29 a4 3b 40 00 2d 06  11 f2 40 ee 93 71 c0 a8   ·)·;@·-· ··@
0020  01 7a 00 50 ec e3 14 d4  c2 a1 9f dc 43 5d 80 18   ·z·P···· ···
0030  06 b4 fb 3d 00 00 01 01  08 0a ef 6c ee 58 0f 4c   ···=···· ···
0040  9f c9 48 54 54 50 2f 31  2e 31 20 32 30 30 20 4f   ··HTTP/1 .1 
0050  4b 0d 0a 44 61 74 65 3a  20 54 68 75 2c 20 31 32   K··Date:  Th
```

## Length of Fourth TCP segment: 0

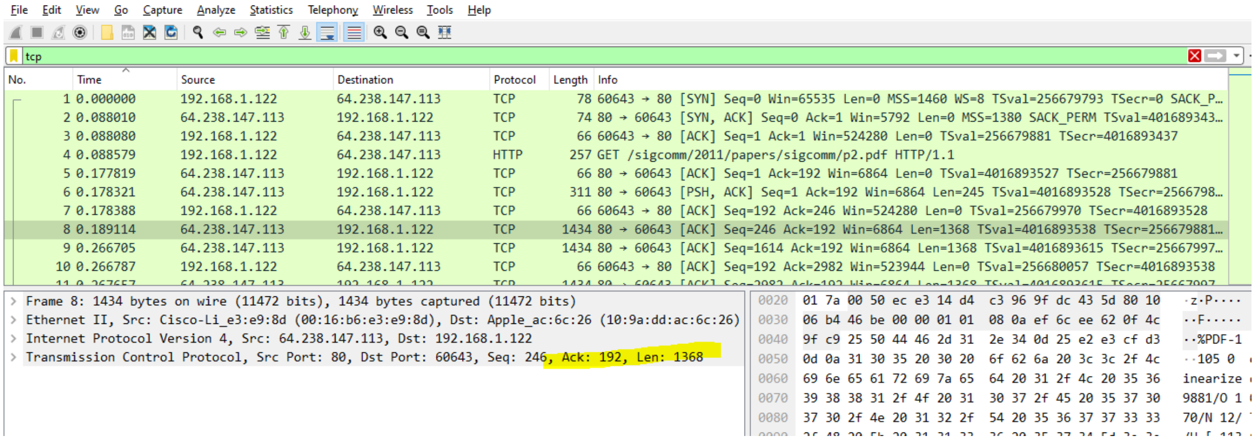

trace-tcp (1).pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
tcp

```
No.   Time      Source          Destination     Protocol Length Info
  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 SACI
  2 0.088010    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 TSval=401689
  3 0.088080    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 0.088579    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=2566
  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=40168935
  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=256679
  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=25667
 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=4016893

> Frame 7: 66 bytes on wire (528 bits), 66 bytes captured (528 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: 192, Ack: 246, Len: 0

0000  00 16 b6 e3 e9 8d 10 9a  dd ac 6c 26 08 00 45 00   ··
0010  00 34 5f be 40 00 40 06  44 84 c0 a8 01 7a 40 ee   ·4
0020  93 71 ec e3 00 50 9f dc  43 5d 14 d4 c3 96 80 10   ·q
0030  ff ff aa 2e 00 00 01 01  08 0a 0f 4c a0 22 ef 6c   ··
0040  ee 58                                              ·X
```

## Length of Fifth TCP segment: 1368

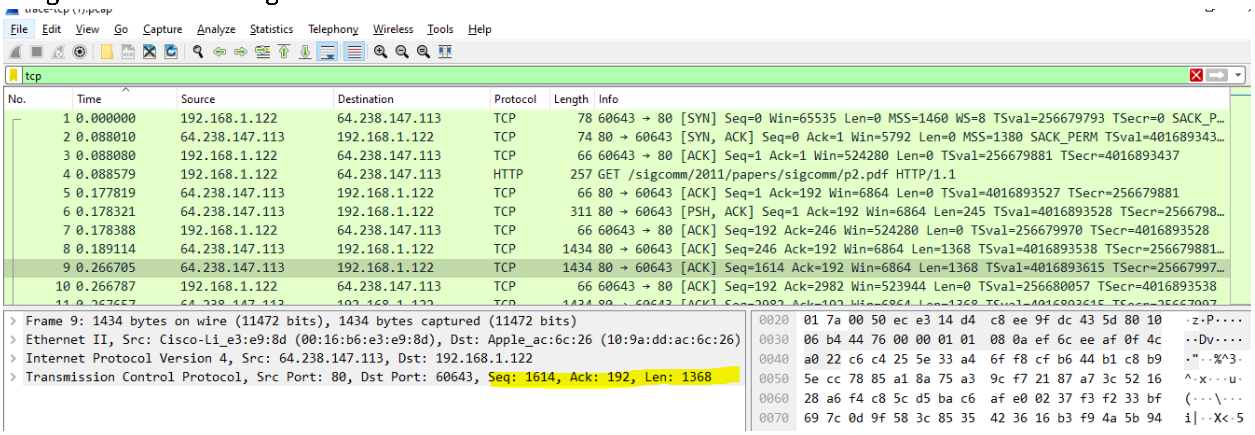

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
tcp

```
No.   Time      Source          Destination     Protocol Length Info
  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_P…
  2 0.088010    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 TSval=401689343…
  3 0.088080    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 0.088579    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=2566798…
  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…
  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=25667997…
 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

> Frame 8: 1434 bytes on wire (11472 bits), 1434 bytes captured (11472 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: 246, Ack: 192, Len: 1368

0020  01 7a 00 50 ec e3 14 d4  c3 96 9f dc 43 5d 80 10   ·z·P····
0030  06 b4 46 be 00 00 01 01  08 0a ef 6c ee 62 0f 4c   ··F·····
0040  9f c9 25 50 44 46 2d 31  2e 34 0d 25 e2 e3 cf d3   ··%PDF-1
0050  0d 0a 31 30 35 20 30 20  6f 62 6a 20 3c 3c 2f 4c   ··105 0
0060  69 6e 65 61 72 69 7a 65  64 20 31 2f 4c 20 35 36   inearize
0070  39 38 38 31 2f 4f 20 31  30 37 2f 45 20 35 37 30   9881/O 1
0080  37 30 2f 4e 20 31 32 2f  54 20 35 36 37 37 33 33   70/N 12/
```

## Length of Sixth TCP segment: 1368


trace-tcp (1).pcap
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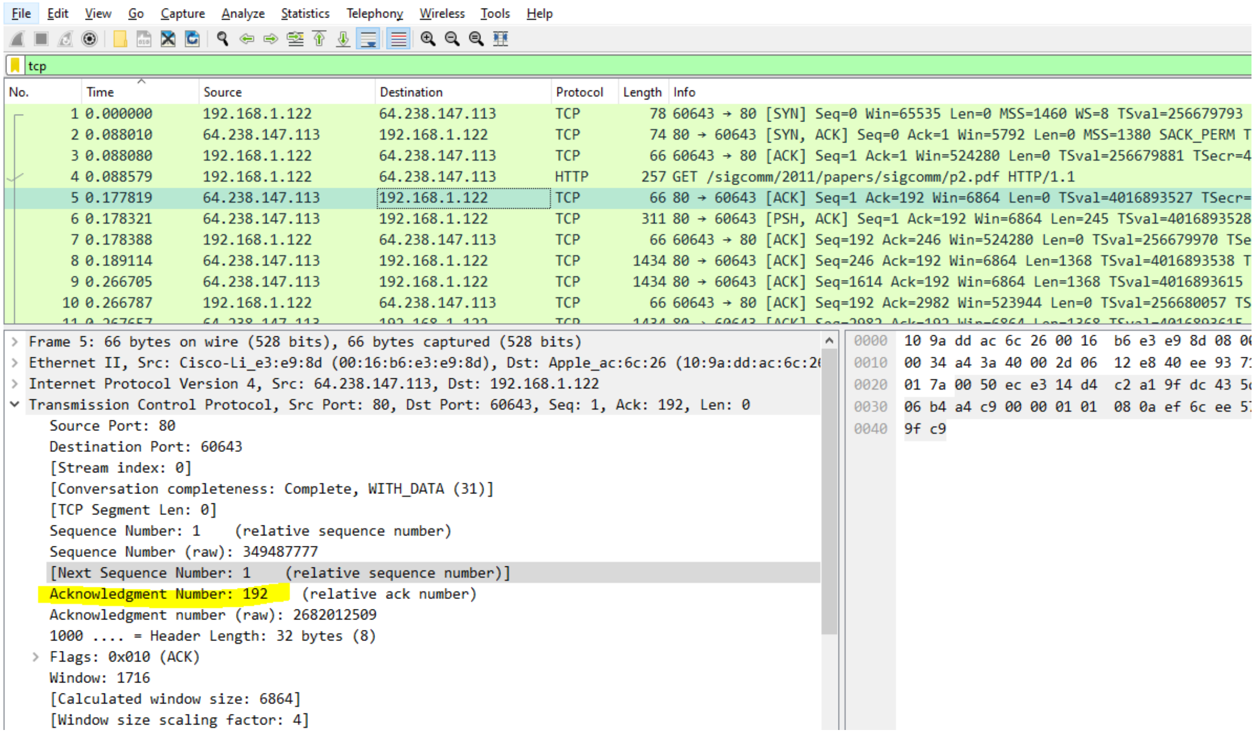
tcp

```
No.   Time      Source          Destination     Protocol Length Info
  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_P…
  2 0.088010    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 TSval=401689343…
  3 0.088080    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 0.088579    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=2566798…
  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…
  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=25667997…
 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

> Frame 9: 1434 bytes on wire (11472 bits), 1434 bytes captured (11472 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: 1614, Ack: 192, Len: 1368

0020  01 7a 00 50 ec e3 14 d4  c8 ee 9f dc 43 5d 80 10   ·z·P····
0030  06 b4 44 76 00 00 01 01  08 0a ef 6c ee af 0f 4c   ··Dv····
0040  a0 22 c6 c4 25 5e 33 a4  6f f8 cf b6 44 b1 c8 b9   ·"··%^3·
0050  5e cc 78 85 a1 8a 75 a3  9c f7 21 87 a7 3c 52 16   ^·x···u·
0060  28 a6 f4 c8 5c d5 ba c6  af e0 02 37 f3 f2 33 bf   (···\···
0070  69 7c 0d 9f 58 3c 85 35  42 36 16 b3 f9 4a 5b 94   i|··X<·5
```

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

   Solution: IN THE PACKET NUMBER 5 AND 6 THEIR ACKKNOWLEGMENT NUMBER IS THE SAME SO WE CAN DETERMINE THROUGH THIS DATA THAT THERE WAS RETRANSMISSION IN THE TRACE FILE.

   For packet 5

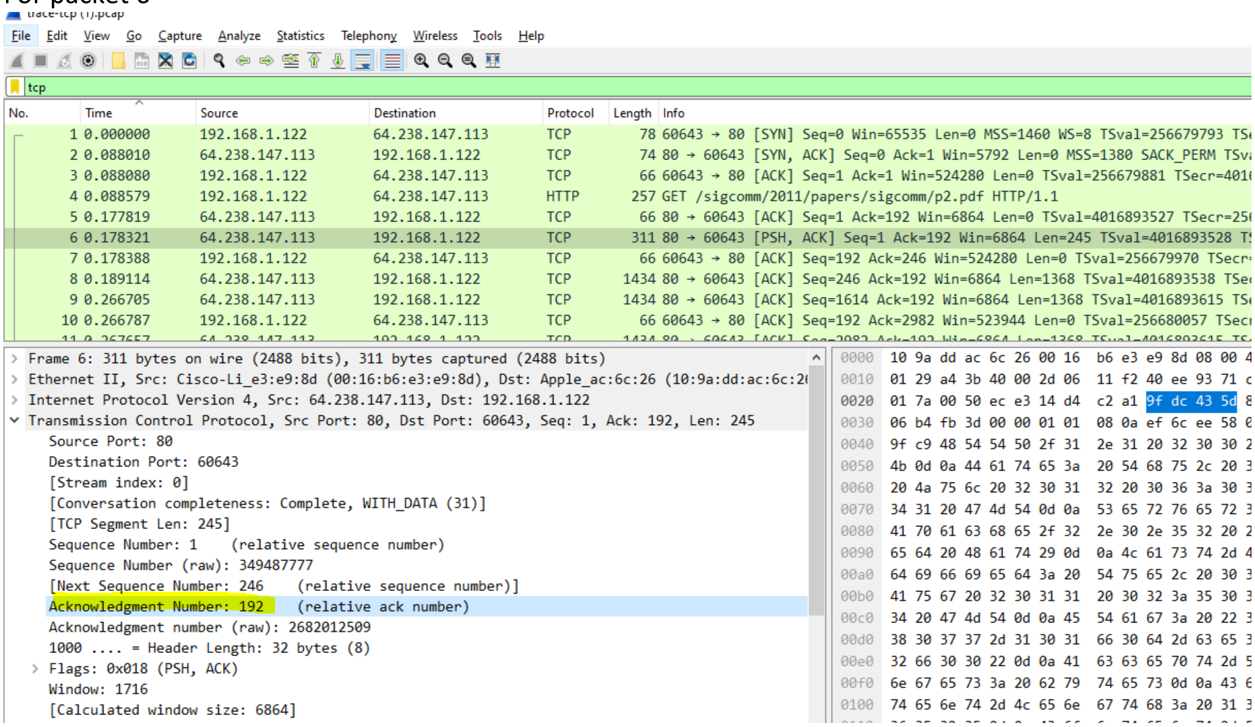


```
No.     Time        Source           Destination      Protocol  Length Info
     1 0.000000    192.168.1.122    64.238.147.113   TCP         78 60643 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=8 TSval=256679793
     2 0.088010    64.238.147.113   192.168.1.122    TCP         74 80 → 60643 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM T
     3 0.088080    192.168.1.122    64.238.147.113   TCP         66 60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Len=0 TSval=256679881 TSecr=4
     4 0.088579    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=
     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
     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 TSe
     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 T
     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
    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 TS
    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
```

```
> Frame 5: 66 bytes on wire (528 bits), 66 bytes captured (528 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:2
> Internet Protocol Version 4, Src: 64.238.147.113, Dst: 192.168.1.122
v Transmission Control Protocol, Src Port: 80, Dst Port: 60643, Seq: 1, Ack: 192, Len: 0
    Source Port: 80
    Destination Port: 60643
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 0]
    Sequence Number: 1    (relative sequence number)
    Sequence Number (raw): 349487777
    [Next Sequence Number: 1    (relative sequence number)]
    Acknowledgment Number: 192    (relative ack number)
    Acknowledgment number (raw): 2682012509
    1000 .... = Header Length: 32 bytes (8)
  > Flags: 0x010 (ACK)
    Window: 1716
    [Calculated window size: 6864]
    [Window size scaling factor: 4]
```

```
0000  10 9a dd ac 6c 26 00 16  b6 e3 e9 8d 08 0
0010  00 34 a4 3a 40 00 2d 06  12 e8 40 ee 93 7
0020  01 7a 00 50 ec e3 14 d4  c2 a1 9f dc 43 5
0030  06 b4 a4 c9 00 00 01 01  08 0a ef 6c ee 5
0040  9f c9
```

For packet 6



trace-tcp (1).pcap
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```
tcp
```

```
No.     Time       Source           Destination      Protocol  Length Info
      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 TS
      2 0.088010   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 TSv
      3 0.088080   192.168.1.122    64.238.147.113   TCP           66 60643 → 80 [ACK] Seq=1 Ack=1 Win=524280 Len=0 TSval=256679881 TSecr=401
      4 0.088579   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=25
      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 T
      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
      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 TSe
      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 TS
     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 TSec
```

```
> Frame 6: 311 bytes on wire (2488 bits), 311 bytes captured (2488 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:2
> Internet Protocol Version 4, Src: 64.238.147.113, Dst: 192.168.1.122
v Transmission Control Protocol, Src Port: 80, Dst Port: 60643, Seq: 1, Ack: 192, Len: 245
    Source Port: 80
    Destination Port: 60643
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 245]
    Sequence Number: 1    (relative sequence number)
    Sequence Number (raw): 349487777
    [Next Sequence Number: 246    (relative sequence number)]
    Acknowledgment Number: 192    (relative ack number)
    Acknowledgment number (raw): 2682012509
    1000 .... = Header Length: 32 bytes (8)
  > Flags: 0x018 (PSH, ACK)
    Window: 1716
    [Calculated window size: 6864]
```

```
0000  10 9a dd ac 6c 26 00 16  b6 e3 e9 8d 08 00 4
0010  01 29 a4 3b 40 00 2d 06  11 f2 40 ee 93 71 c
0020  01 7a 00 50 ec e3 14 d4  c2 a1 9f dc 43 5d 8
0030  06 b4 fb 3d 00 00 01 01  08 0a ef 6c ee 58 0
0040  9f c9 48 54 54 50 2f 31  2e 31 20 32 30 30 2
0050  4b 0d 0a 44 61 74 65 3a  20 54 68 75 2c 20 3
0060  20 4a 75 6c 20 32 30 31  32 20 30 36 3a 30 3
0070  34 31 20 47 4d 54 0d 0a  53 65 72 76 65 72 3
0080  41 70 61 63 68 65 2f 32  2e 30 2e 35 32 20 2
0090  65 64 20 48 61 74 29 0d  0a 4c 61 73 74 2d 4
00a0  64 69 66 69 65 64 3a 20  54 75 65 2c 20 30 3
00b0  41 75 67 20 32 30 31 31  20 30 32 3a 35 30 3
00c0  34 20 47 4d 54 0d 0a 45  54 61 67 3a 20 22 3
00d0  38 30 37 37 2d 31 30 31  66 30 64 2d 63 65 3
00e0  32 66 30 30 22 0d 0a 41  63 63 65 70 74 2d 5
00f0  6e 67 65 73 3a 20 62 79  74 65 73 0d 0a 43 6
0100  74 65 6e 74 2d 4c 65 6e  67 74 68 3a 20 31 3
```