LAB 3a

1/ IP address and TCP port number of source:

Src Port: 1161

IP address: 192.168.1.102

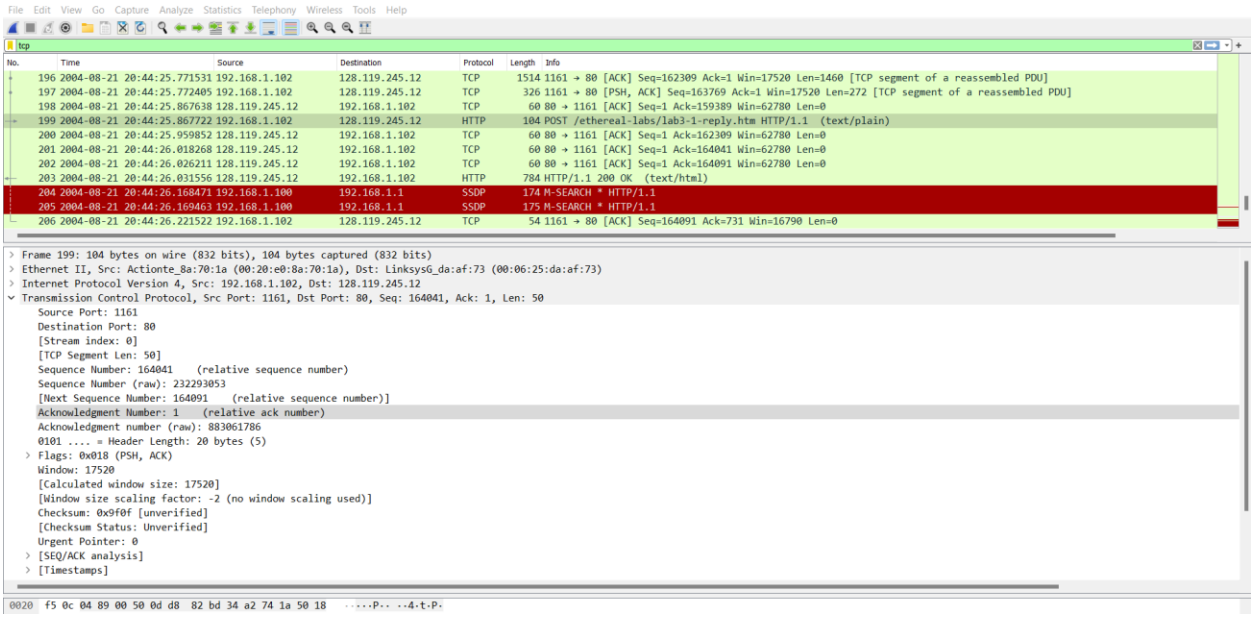
```
No.     Time                           Source                Destination           Protocol Length Info
    199 2004-08-21 20:44:25.867722     192.168.1.102         128.119.245.12        HTTP     104    POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1
(text/plain)
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [TCP Segment Len: 50]
    Sequence Number: 164041    (relative sequence number)
    Sequence Number (raw): 232293053
    [Next Sequence Number: 164091    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 883061786
    0101 .... = Header Length: 20 bytes (5)
    Flags: 0x018 (PSH, ACK)
    Window: 17520
    [Calculated window size: 17520]
    [Window size scaling factor: -2 (no window scaling used)]
    Checksum: 0x9f0f [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (50 bytes)
    TCP segment data (50 bytes)
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460),
#20(1460), #21(1460), #22(1460), #23(892), #30(1460), #31(1460), #32(1460), #33(1460), #34(1460), #3]
Hypertext Transfer Protocol
MIME Multipart Media Encapsulation, Type: multipart/form-data, Boundary: "---------------------------265001916915724"
```

2/ IP address of gaia.cs.umass.edu: 128.119.245.12

Sending Port: 199

Receive Port: 203

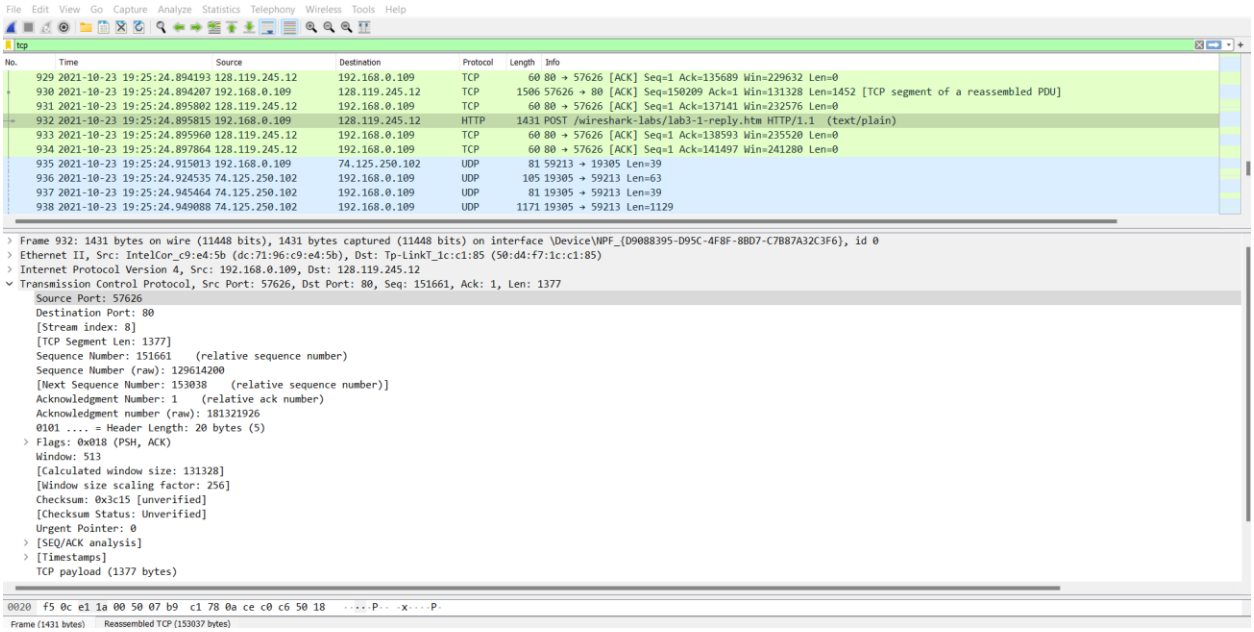
```
No.     Time                           Source                Destination           Protocol Length Info
    199 2004-08-21 20:44:25.867722     192.168.1.102         128.119.245.12        HTTP     104    POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1
(text/plain)
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [TCP Segment Len: 50]
    Sequence Number: 164041    (relative sequence number)
    Sequence Number (raw): 232293053
    [Next Sequence Number: 164091    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 883061786
    0101 .... = Header Length: 20 bytes (5)
    Flags: 0x018 (PSH, ACK)
    Window: 17520
    [Calculated window size: 17520]
    [Window size scaling factor: -2 (no window scaling used)]
    Checksum: 0x9f0f [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (50 bytes)
    TCP segment data (50 bytes)
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460),
#20(1460), #21(1460), #22(1460), #23(892), #30(1460), #31(1460), #32(1460), #33(1460), #34(1460), #3]
Hypertext Transfer Protocol
MIME Multipart Media Encapsulation, Type: multipart/form-data, Boundary: "---------------------------265001916915724"
```



3/

IP address: 192.168.0.109

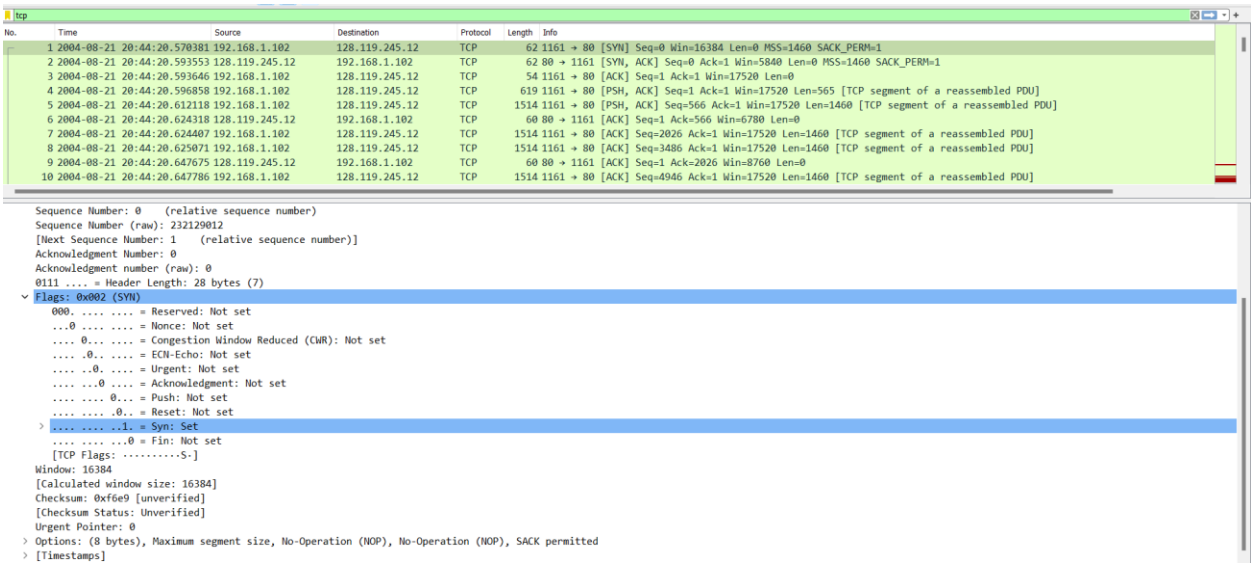
Source Port: 57626



4/

The sequence number of the TCP SYN segment is 0 that is used to imitate the TCP connection between the client computer and gaia.cs.umass.edu.

In the Flags section, the Syn flag is set to 1 which indicates that this segment is a SYN segment



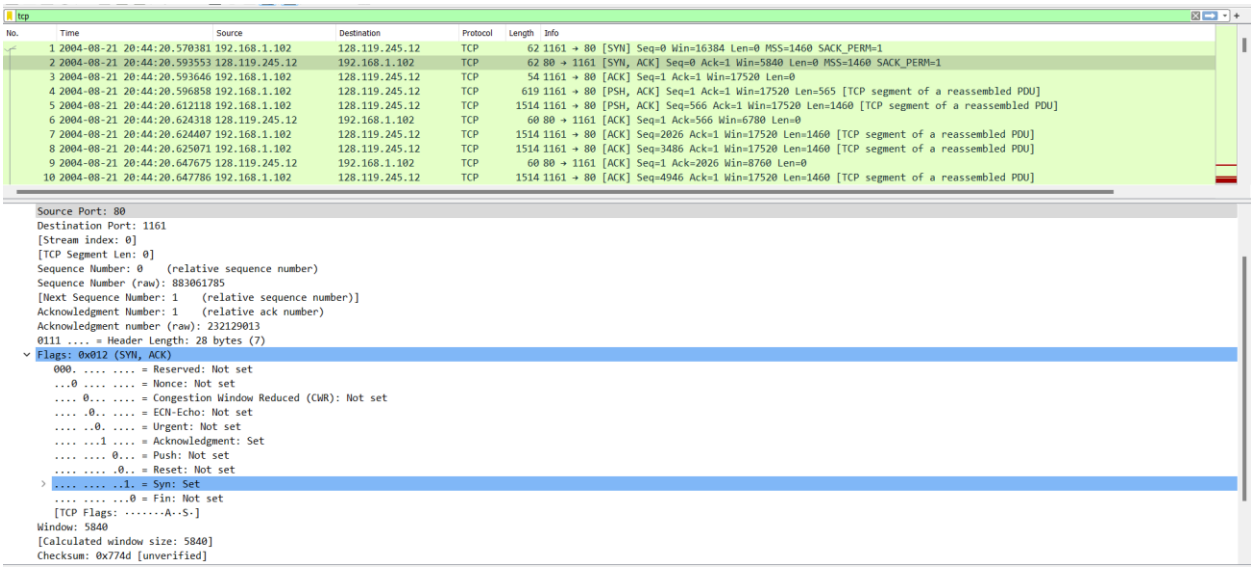
5/

The sequence number of the SYNACK segment sent by gaia.cs.umass.edu to the client computer in reply to the SYN is 0.

The value of the Acknowledgement field in the SYNACK segment is 1.

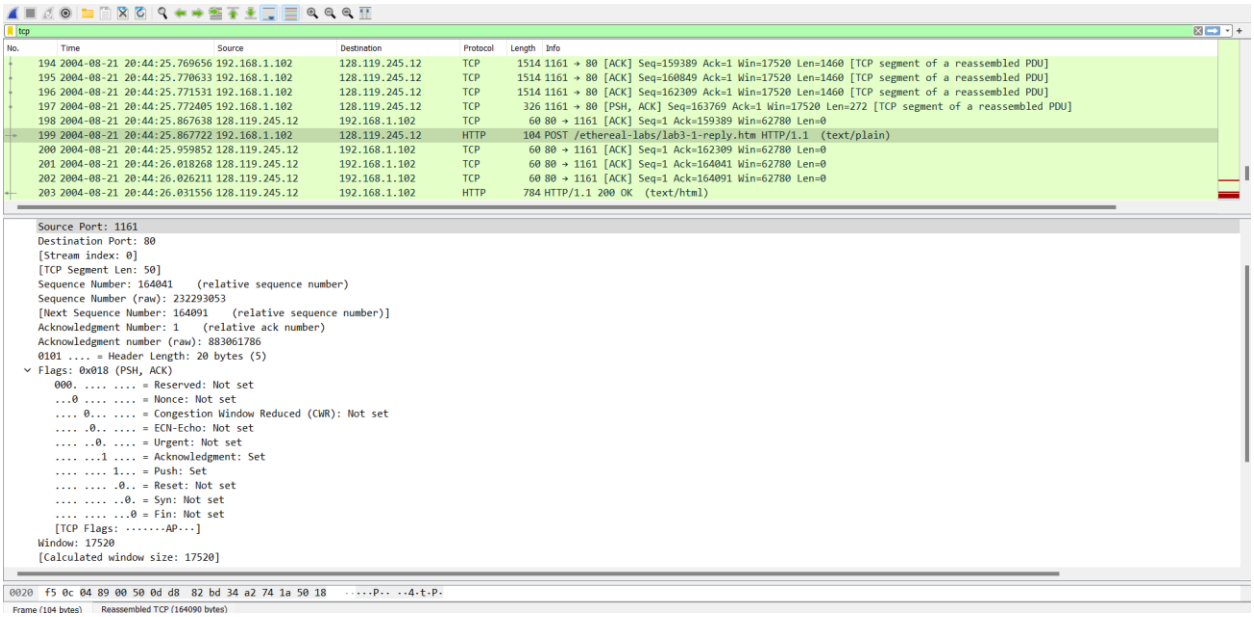
The value of the ACKnowledgement field in the SYNACK segment is determined by the server gaia.cs.umass.edu

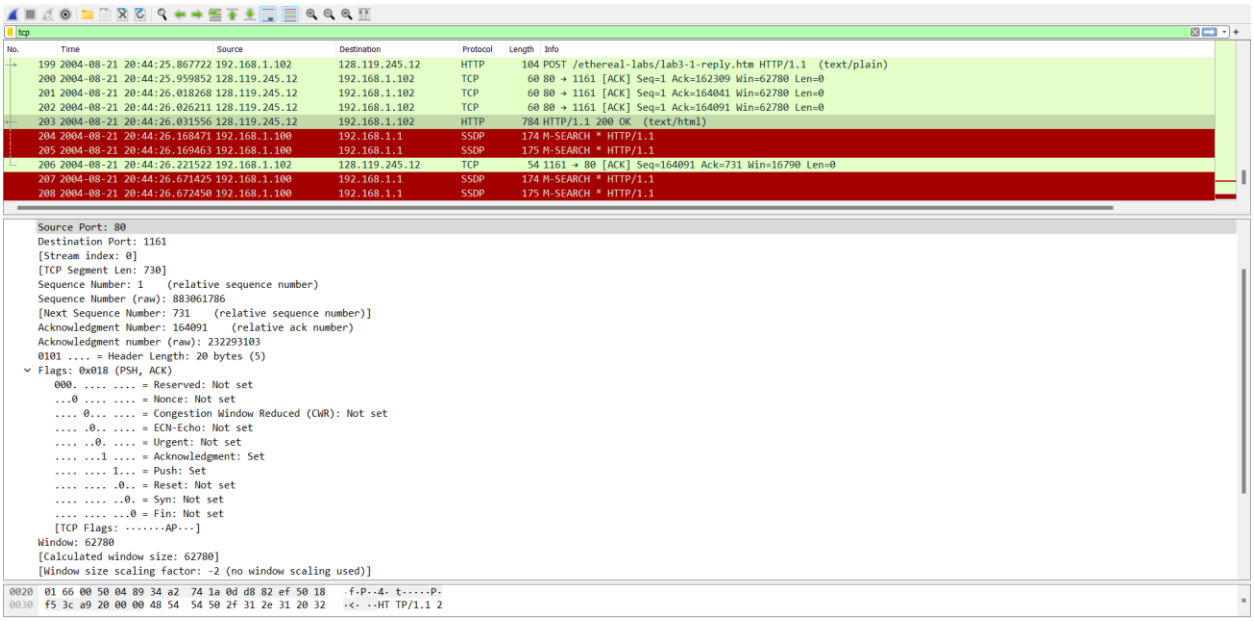
The segment that identifies the segment as a SYNACK segment is 1



6/

The sequence number of the TCP segment containing the HTTP POST command is 1





7/ First six segments are 4, 5, 7, 8, 10, 11

Sequence index of segment 4: 1

Sequence index of segment 5: 566

Sequence index of segment 7: 2026

Sequence index of segment 8: 3486

Sequence index of segment 10: 4946

Sequence index of segment 11: 6406

The ACK of 6 first segments: 6, 9, 12, 14, 15, 16

Segment 1: sent: 0.596858 ack: 0.624318

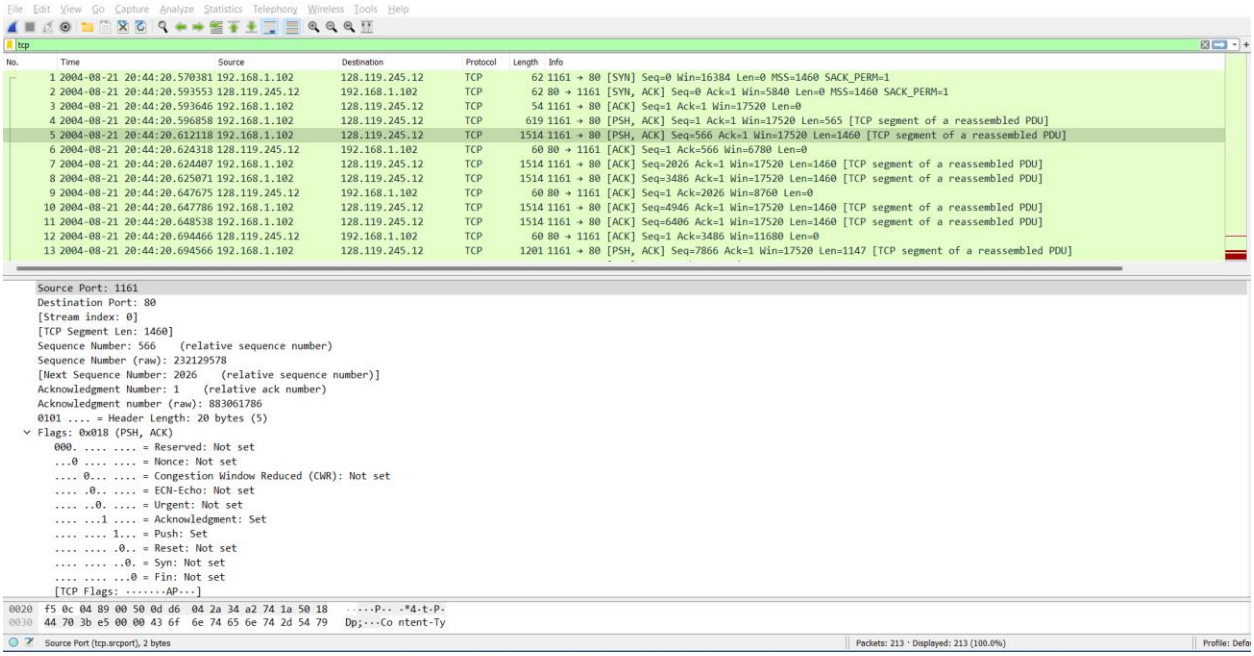
Segment 2: sent: 0.612118 ack: 0.647675

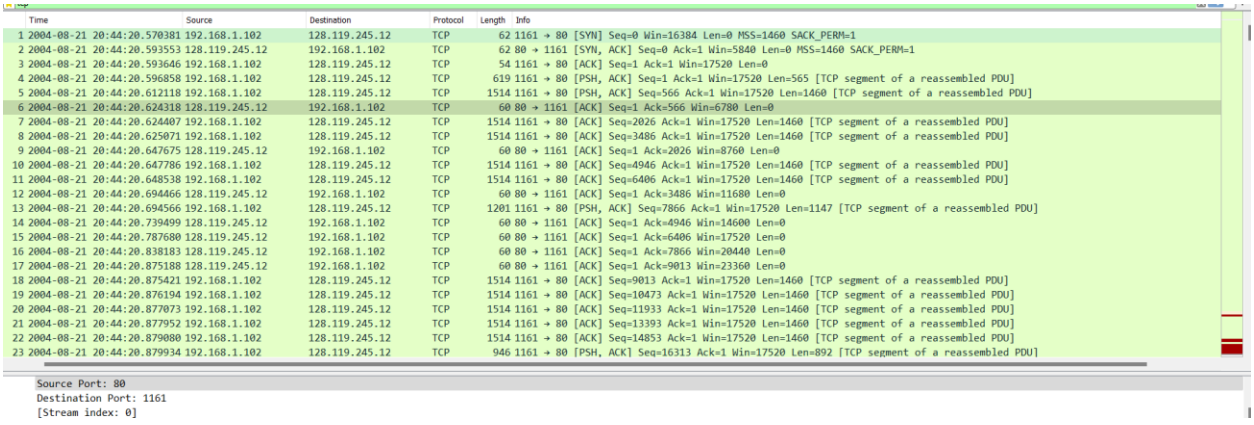
Segment 3: sent: 0.624407 ack: 0.694466

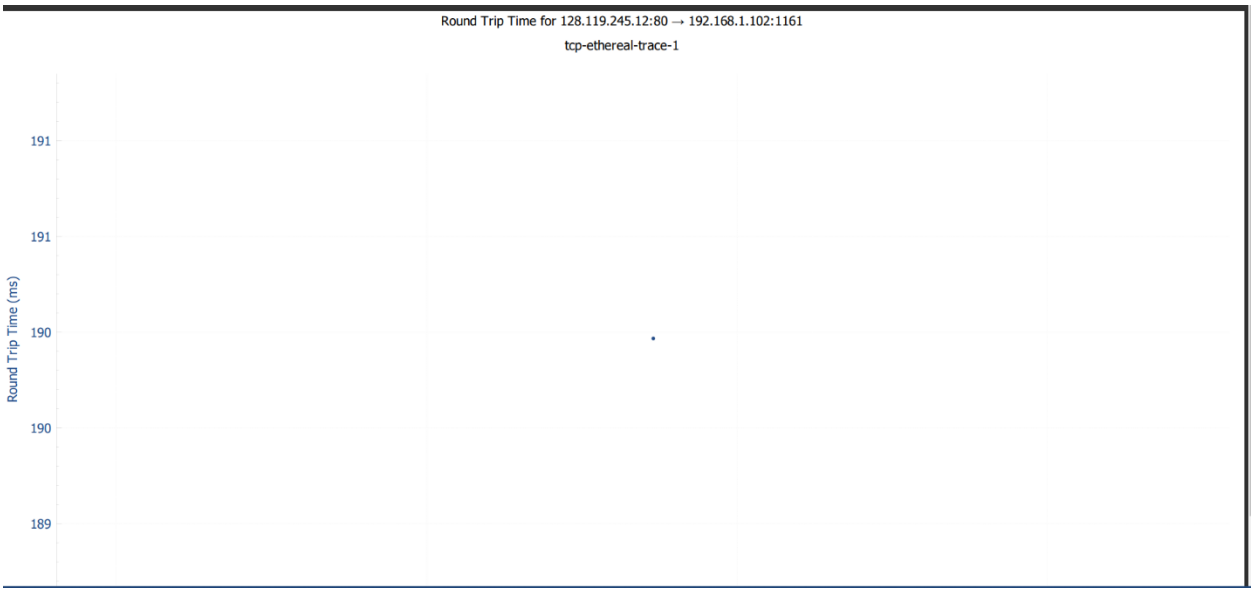
Segment 4: sent: 0.625071 ack: 0.739499

Segment 5: sent: 0.647786 ack: 0.787680

Segment 6: sent: 0.648538 ack: 0.838183

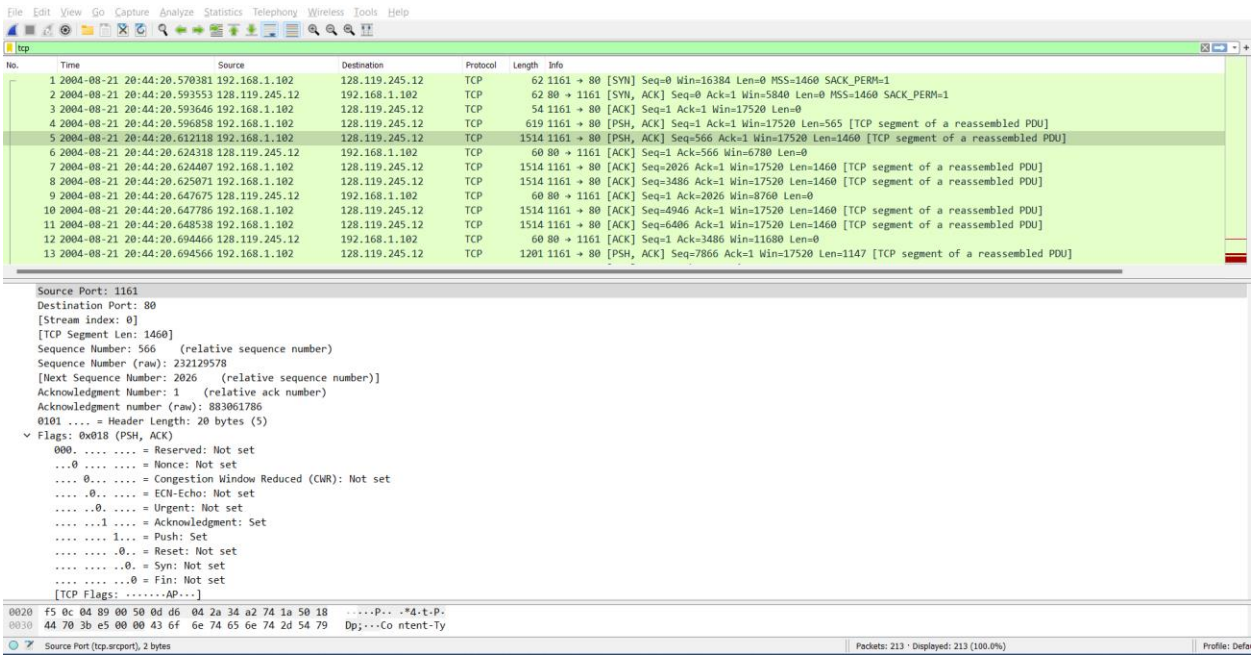

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
tcp
No. Time Source Destination Protocol Length Info
1 2004-08-21 20:44:20.570381 192.168.1.102 128.119.245.12 TCP 62 1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2 2004-08-21 20:44:20.593553 128.119.245.12 192.168.1.102 TCP 62 80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3 2004-08-21 20:44:20.593646 192.168.1.102 128.119.245.12 TCP 54 1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4 2004-08-21 20:44:20.596858 192.168.1.102 128.119.245.12 TCP 619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5 2004-08-21 20:44:20.612118 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6 2004-08-21 20:44:20.624318 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7 2004-08-21 20:44:20.624407 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8 2004-08-21 20:44:20.625071 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9 2004-08-21 20:44:20.647675 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10 2004-08-21 20:44:20.647786 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11 2004-08-21 20:44:20.648538 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12 2004-08-21 20:44:20.694466 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13 2004-08-21 20:44:20.694566 192.168.1.102 128.119.245.12 TCP 1201 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]
Source Port: 1161
Destination Port: 80
[Stream index: 0]
[TCP Segment Len: 1460]
Sequence Number: 566 (relative sequence number)
Sequence Number (raw): 232129578
[Next Sequence Number: 2026 (relative sequence number)]
Acknowledgment Number: 1 (relative ack number)
Acknowledgment number (raw): 883061786
0101 .... = Header Length: 20 bytes (5)
Flags: 0x018 (PSH, 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
.... 1... = Push: Set
.... .0.. = Reset: Not set
....0. = Syn: Not set
....0 = Fin: Not set
[TCP Flags: ·····AP···]
0020 f5 0c 04 89 00 50 0d d6 04 2a 34 a2 74 1a 50 18 ·····P·· ·*4·t·P·
0030 44 70 3b e5 00 00 43 6f 6e 74 65 6e 74 2d 54 79 Dp;···Co ntent-Ty
Source Port (tcp.srcport), 2 bytes
Packets: 213 · Displayed: 213 (100.0%)
Profile: Defa


Time Source Destination Protocol Length Info
1 2004-08-21 20:44:20.570381 192.168.1.102 128.119.245.12 TCP 62 1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2 2004-08-21 20:44:20.593553 128.119.245.12 192.168.1.102 TCP 62 80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3 2004-08-21 20:44:20.593646 192.168.1.102 128.119.245.12 TCP 54 1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4 2004-08-21 20:44:20.596858 192.168.1.102 128.119.245.12 TCP 619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5 2004-08-21 20:44:20.612118 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6 2004-08-21 20:44:20.624318 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7 2004-08-21 20:44:20.624407 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8 2004-08-21 20:44:20.625071 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9 2004-08-21 20:44:20.647675 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10 2004-08-21 20:44:20.647786 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11 2004-08-21 20:44:20.648538 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12 2004-08-21 20:44:20.694466 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13 2004-08-21 20:44:20.694566 192.168.1.102 128.119.245.12 TCP 1201 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]
14 2004-08-21 20:44:20.739499 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15 2004-08-21 20:44:20.787680 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16 2004-08-21 20:44:20.838183 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17 2004-08-21 20:44:20.875188 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 Len=0
18 2004-08-21 20:44:20.875421 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=9013 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
19 2004-08-21 20:44:20.876194 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=10473 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
20 2004-08-21 20:44:20.877073 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=11933 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
21 2004-08-21 20:44:20.877952 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=13393 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
22 2004-08-21 20:44:20.879080 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=14853 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
23 2004-08-21 20:44:20.879934 192.168.1.102 128.119.245.12 TCP 946 1161 → 80 [PSH, ACK] Seq=16313 Ack=1 Win=17520 Len=892 [TCP segment of a reassembled PDU]
Source Port: 80
Destination Port: 1161
[Stream index: 0]



8/ Length of 1st segment: 619

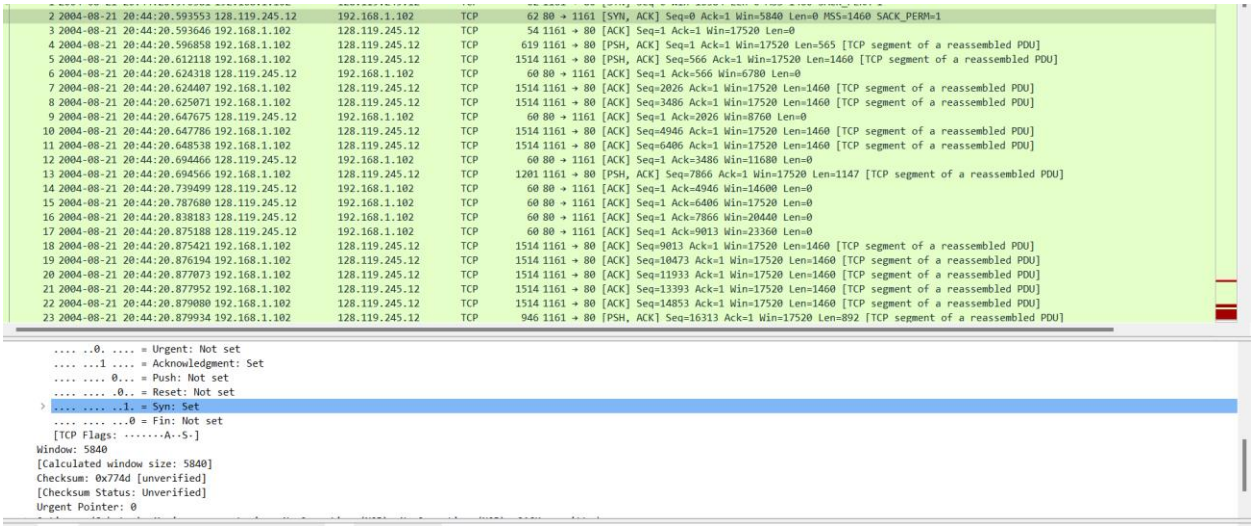
Length of 5 remained segment: 1514



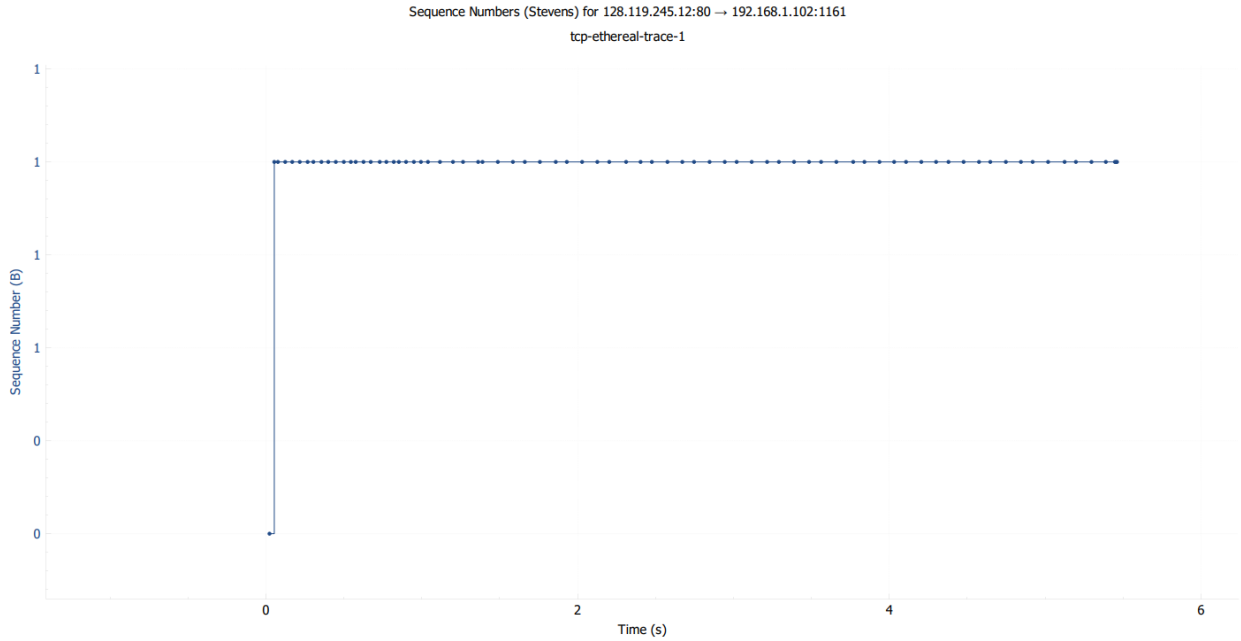
9/

The minimum amount of available buffer space advertised at the received for the entire trace is indicated first ACK from the server, its value is 5840 bytes.

The sender is never throttled due to lacking of receiver buffer space.



10/



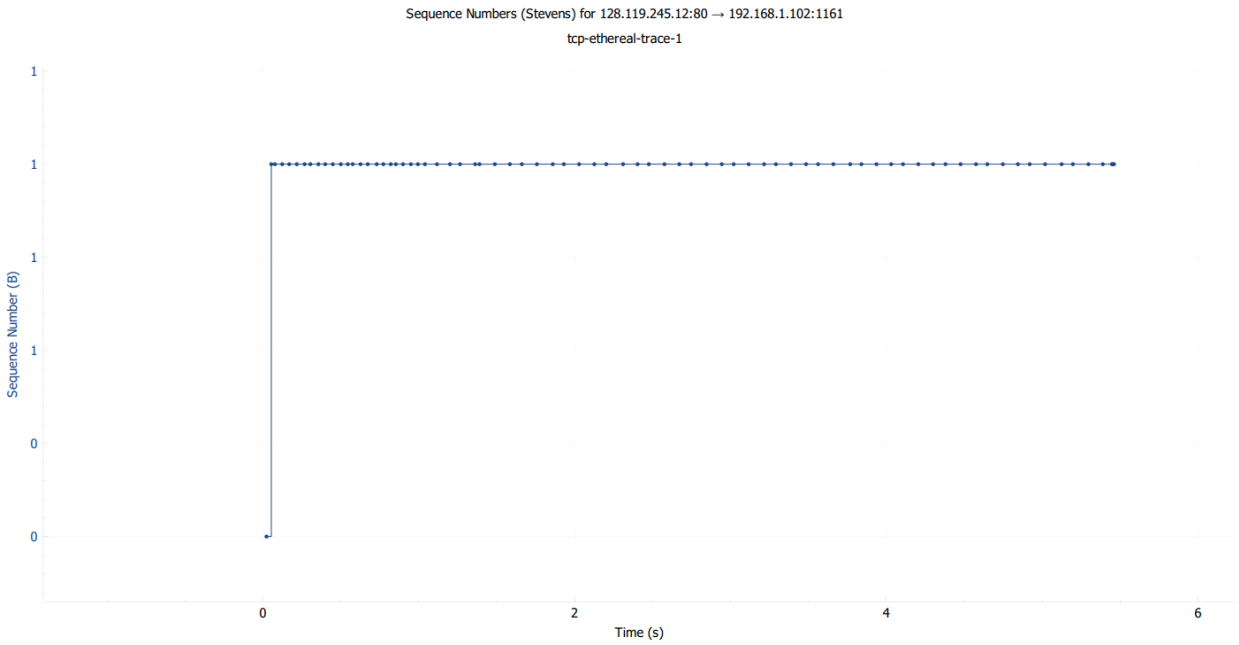
There are no retransmitted segments in the trace file which in the time sequence graph (stevens).

11/

The difference between the acknowledged sequence numbers of two consecutive ACK indicates the data received by the server between these two ACK.

The receiver is ACKing every other segment. For example, segment of No. 14 acknowledged data.

13/


Sequence Numbers (Stevens) for 128.119.245.12:80 → 192.168.1.102:1161
tcp-ethereal-trace-1
Sequence Number (B)
1
1
1
1
0
0
0
2
4
6
Time (s)