

# COMPUTER NETWORK ORGANIZATION

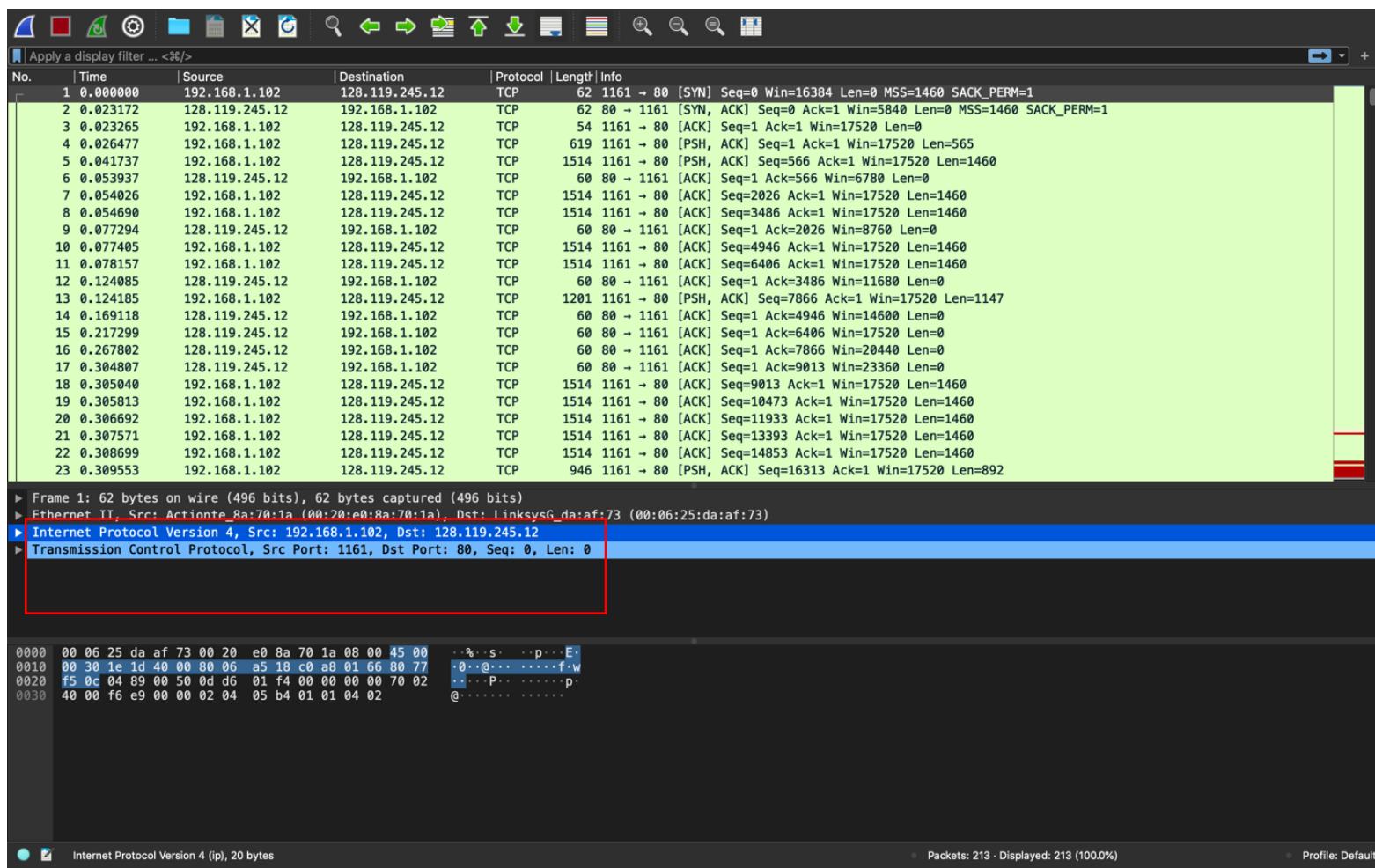
## Lab 2

- What is the IP address and TCP port number used by the client computer (source) that is transferring the file to gaia.cs.umass.edu? To answer this question, it's probably easiest to select an HTTP message and explore the details of the TCP packet used to carry this HTTP message, using the "details of the selected packet header window" (refer to Figure 2 in the "Getting Started with Wireshark" Lab if you're uncertain about the Wireshark windows.

Answer :

IP address used by the client computer: 192.168.1.102

TCP port number used by the client computer: 1161



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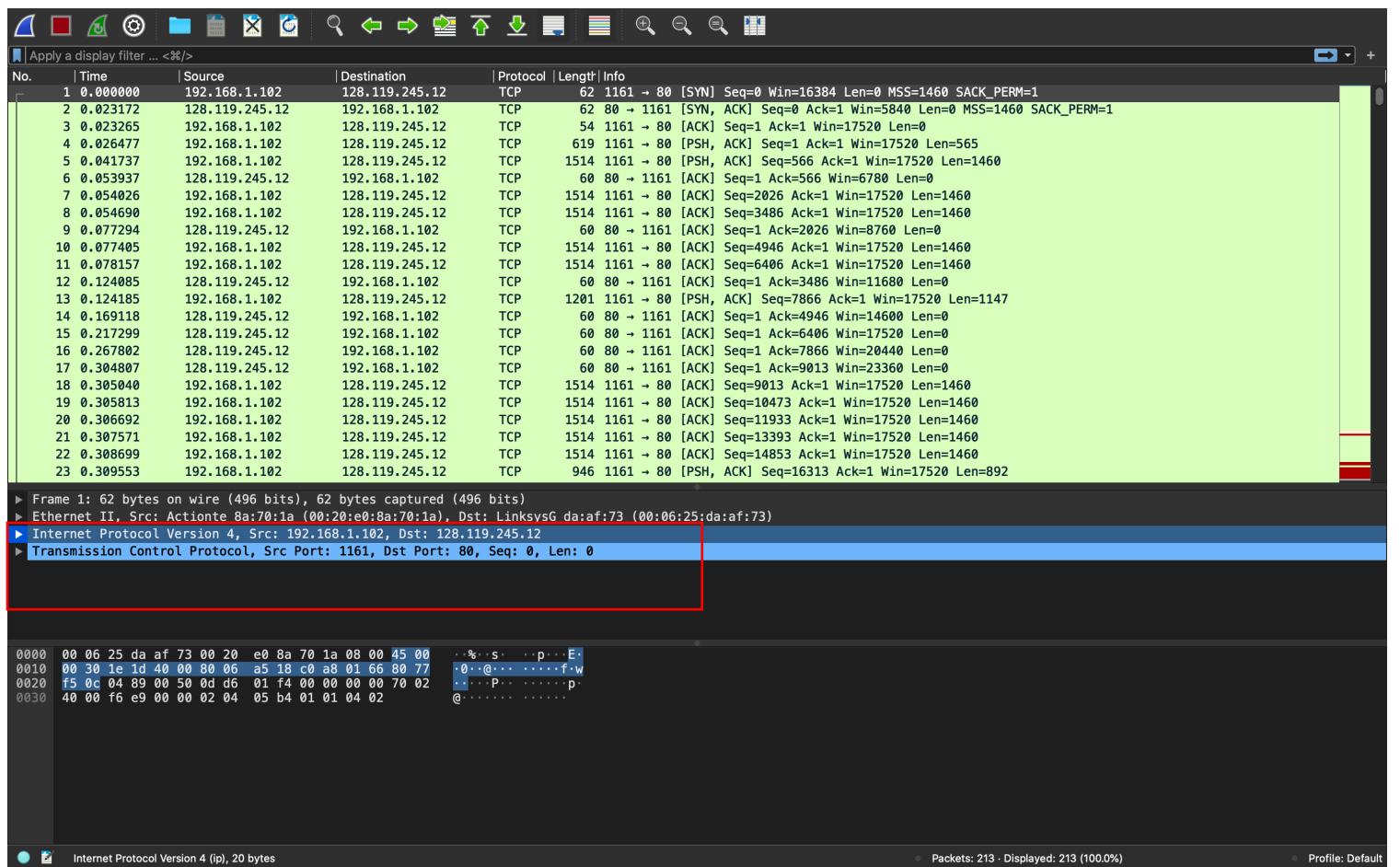
## Lab 2

2. What is the IP address of gaia.cs.umass.edu? On what port number is it sending and receiving TCP segments for this connection?

Answer :

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

port number is: 80



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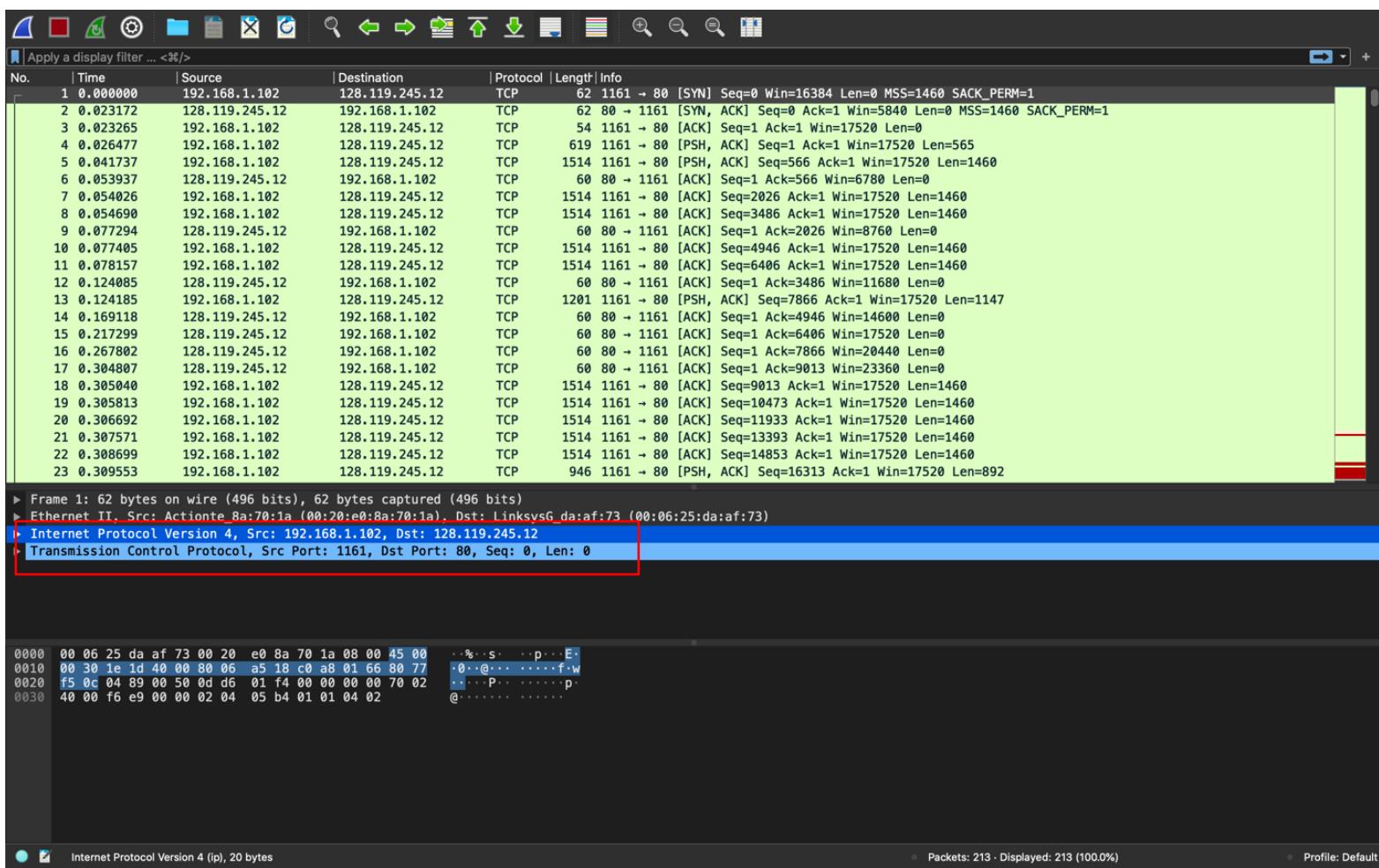
## Lab 2

3. What is the IP address and TCP port number used by your client computer (source) to transfer the file to gaia.cs.umass.edu?

Answer : ( tcp-ethereal-trace-1 packets used )

IP address used by the client computer: 192.168.1.102

TCP port number used by the client computer: 1161



# COMPUTER NETWORK ORGANIZATION

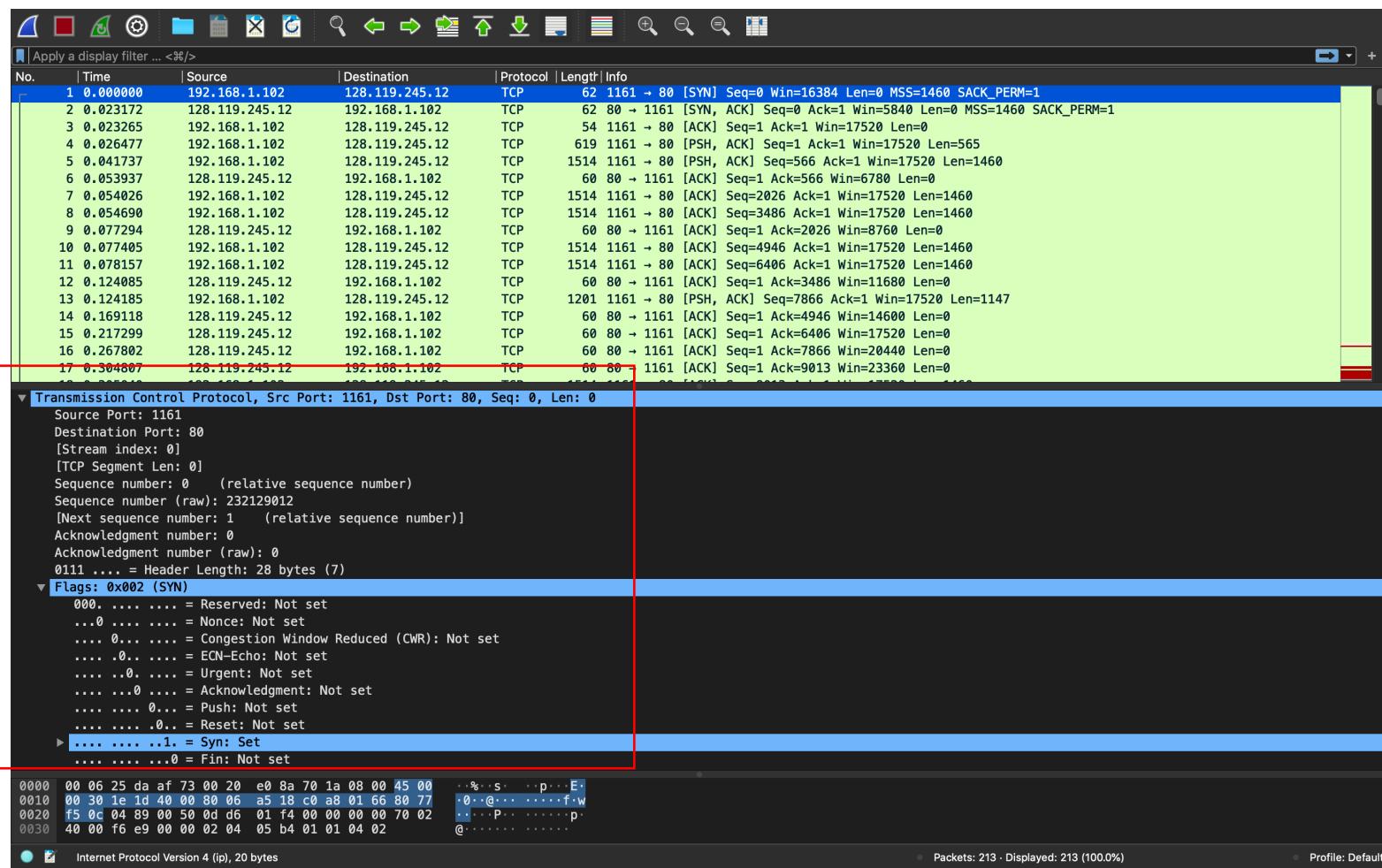
## Lab 2

4. What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and gaia.cs.umass.edu? What is it in the segment that identifies the segment as a SYN segment?

Answer :

Sequence number of the TCP SYN segment is 0.

In the Flags section, the SYN flag is set to 1, thus identifying the segment as a SYN Segment.



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## Lab 2

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

**Answer :**

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

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

The value is determined by the server of gaia.cs.umass.edu. The server adds one to the SYN message it received from the client.

( Here the Client sends a SYN Number 0. So the SYNACK segment is 1. )

Segment is identified as SYNACK segment when the flag section has SYN and ACK set to 1.

NetworkMiner (Windows) - 192.168.1.102 (Local Machine) - 192.168.1.102 (Local Machine)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102

Transmission Control Protocol, Src Port: 80, Dst Port: 1161, Seq: 0, Ack: 1, Len: 0

Source Port: 80  
 Destination Port: 1161  
 [Stream index: 0]  
 [TCP Segment Len: 0]  
 Sequence number: 0 (relative sequence number)  
 Sequence number (raw): 883061785  
 [Next sequence number: 1 (relative sequence number)]  
 Acknowledgment number: 1 (relative ack number)  
 Acknowledgment number (raw): 232129013  
 0111 .... = Header Length: 28 bytes (7)

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

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	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	0.023172	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	0.023265	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=2 Win=17520 Len=0
4	0.026477	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460
6	0.053937	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	0.054026	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
8	0.054690	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
9	0.077294	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	0.077405	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
11	0.078157	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460
12	0.124085	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	0.124185	192.168.1.102	128.119.245.12	TCP	1201	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147
14	0.169118	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15	0.217299	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16	0.267802	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17	0.304807	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 Len=0

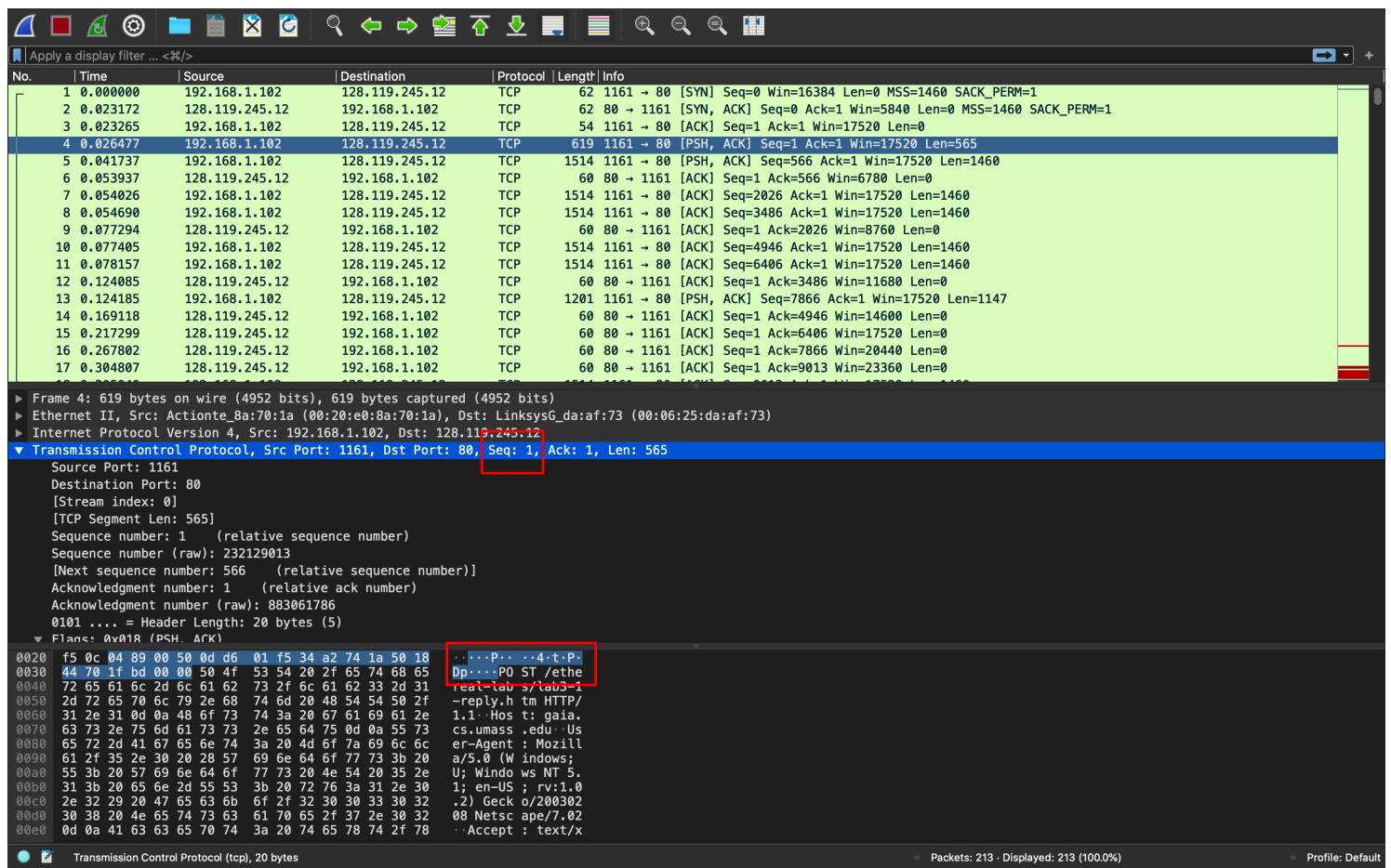
# COMPUTER NETWORK ORGANIZATION

## Lab 2

6. What is the sequence number of the TCP segment containing the HTTP POST command? Note that in order to find the POST command, you'll need to dig into the packet content field at the bottom of the Wireshark window, looking for a segment with a "POST" within its DATA field.

Answer :

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



## COMPUTER NETWORK ORGANIZATION

### Lab 2

7. Consider the TCP segment containing the HTTP POST as the first segment in the TCP connection. What are the sequence numbers of the first six segments in the TCP connection (including the segment containing the HTTP POST)? At what time was each segment sent? When was the ACK for each segment received? Given the difference between when each TCP segment was sent, and when its acknowledgement was received, what is the RTT value for each of the six segments? What is the EstimatedRTT value (see Section 3.5.3, page 242 in text) after the receipt of each ACK? Assume that the value of the EstimatedRTT is equal to the measured RTT for the first segment, and then is computed using the EstimatedRTT equation on page 242 for all subsequent segments.

*Note:* Wireshark has a nice feature that allows you to plot the RTT for each of the TCP segments sent. Select a TCP segment in the “listing of captured packets” window that is being sent from the client to the gaia.cs.umass.edu server. Then select: *Statistics->TCP Stream Graph- >Round Trip Time Graph*.

Answer : The sequence numbers of the first six segments in the TCP connection are –

For First segment:

The sequence number is **1**  
Segment Sent Time: 0.026477  
ACK received at: 0.053937  
RTT value: ( 0.053937 - 0.026477 ) = 0.02746 seconds.  
Estimated RTT: 0.02746 seconds.

For Second segment:

The sequence number is **566**  
Segment Sent Time: 0.041737  
ACK received at: 0.077294  
RTT value: ( 0.077294- 0.041737) = 0.035557 seconds.  
Estimated RTT: ( 0.875 \*Previous Seg ERTT + 0.125 \* RTT )= 0.028472125 sec.

For Third segment:

The sequence number is **2026**  
Segment Sent Time: 0.054026  
ACK received at: 0.124085  
RTT value: ( 0.124085- 0.054026 ) = 0.070059 seconds.  
Estimated RTT: ( 0.875 \*Previous Seg ERTT + 0.125 \* RTT )= 0.03367049 sec.

For Fourth segment:

The sequence number is **3486**  
Segment Sent Time: 0.054690  
ACK received at: 0.169118

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RTT value: ( 0.169118 - 0.054690 ) = 0.114428 seconds.

Estimated RTT: ( 0.875 \* Previous Seg ERTT + 0.125 \* RTT ) = 0.04376518 sec.

For Fifth segment:

The sequence number is **4946**

Segment Sent Time: 0.077405

ACK received at: 0.217299

RTT value: ( 0.217299 - 0.077405 ) = 0.139894 seconds.

Estimated RTT: ( 0.875 \* Previous Seg ERTT + 0.125 \* RTT ) = 0.05sec.

For Sixth segment:

The sequence number is **6406**.

Segment Sent Time: 0.078157

ACK received at: 0.267802

RTT value: ( 0.267802 - 0.078157 ) = 0.18964 seconds.

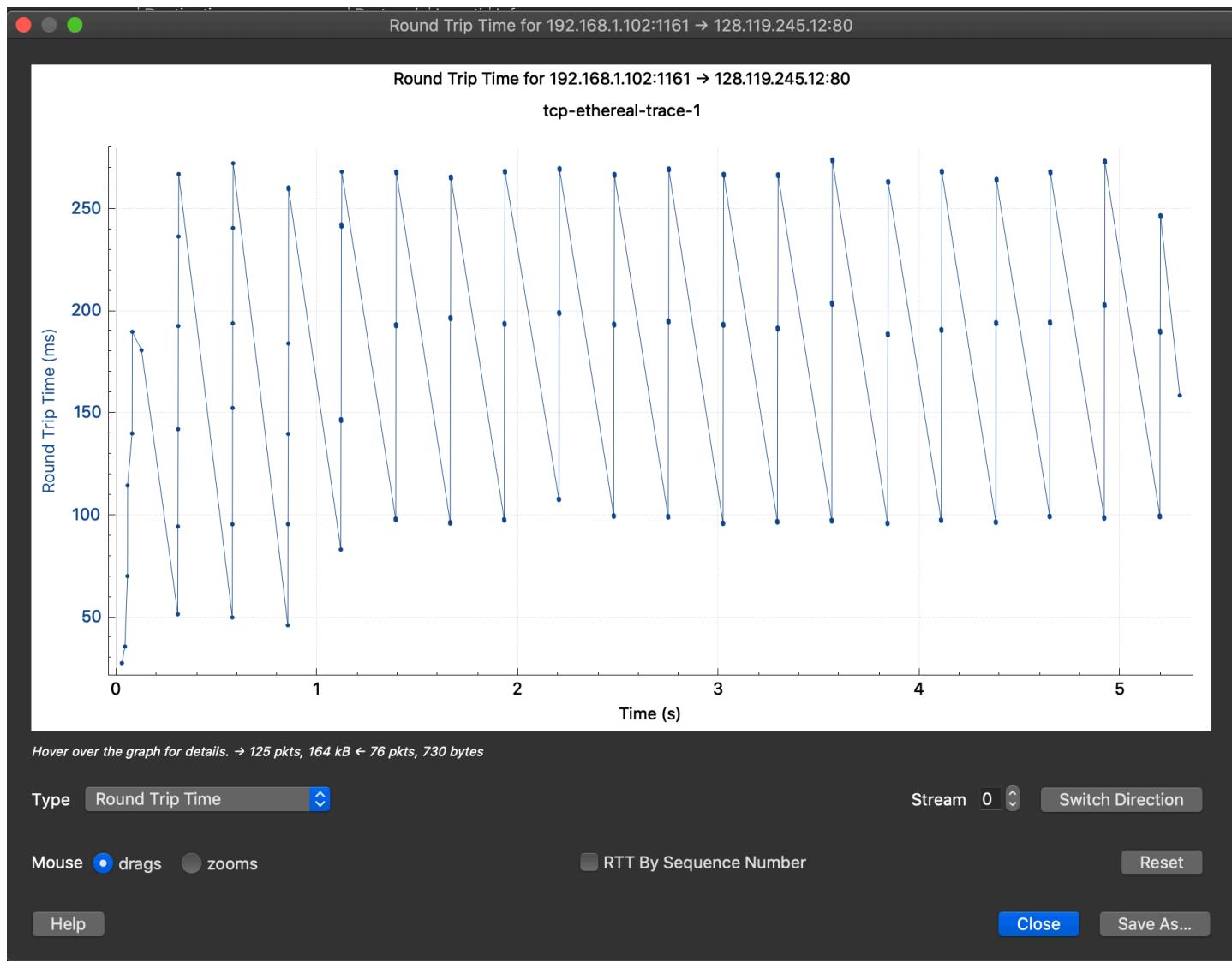
Estimated RTT: ( 0.875 \* Previous Seg ERTT + 0.125 \* RTT ) = 0.07 sec.

Apply a display filter ... <%>						
No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	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	0.023172	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	0.023265	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	0.026477	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460
6	0.053937	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	0.054026	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
8	0.054690	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
9	0.077294	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	0.077405	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
11	0.078157	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460
12	0.124085	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	0.124185	192.168.1.102	128.119.245.12	TCP	1201	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147
14	0.169118	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15	0.217299	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16	0.267802	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0

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## Lab 2

Graph that plot the RTT for each of the TCP segments sent.



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## Lab 2

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

Answer :

Length of first segment is : 565 Bytes

Length of second segment is : 1460 Bytes

Length of third segment is : 1460 Bytes

Length of fourth segment is : 1460 Bytes

Length of fifth segment is : 1460 Bytes

Length of sixth segment is : 1460 Bytes

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	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	0.023172	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	0.023265	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	0.026477	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460
6	0.053937	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	0.054026	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
8	0.054690	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
9	0.077294	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	0.077405	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
11	0.078157	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460
12	0.124085	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11600 Len=0
13	0.124185	192.168.1.102	128.119.245.12	TCP	1201	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147
14	0.169118	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15	0.217299	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16	0.267802	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17	0.268007	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=23260 Len=0
► Frame 11: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 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: 6406, Ack: 1, Len: 1460						
Source Port: 1161 Destination Port: 80 [Stream index: 0] [TCP Segment Len: 1460] Sequence number: 6406 (relative sequence number) Sequence number (raw): 232135418 [Next sequence number: 7866 (relative sequence number)] Acknowledgment number: 1 (relative ack number) Acknowledgment number (raw): 883061786 0101 .... = Header Length: 20 bytes (5) ▼ Flags: 0x010 (ACK) AAA = Reserved: Not set						
0020	f5 0c 04 89 00 50 0d d6 1a fa 34 a2 74 1a 50 10	.....P.. .4-t.P.				
0030	44 70 95 83 00 00 20 55 6e 69 74 65 64 20 53 74	Dp....U nited St				
0040	61 74 65 73 20 63 6f 70 79 72 69 67 68 74 0d 0a	ates cop yrigh...				
0050	6f 6e 20 6f 72 20 66 6f 72 20 74 68 69 73 20 77	on or fo r this w				
0060	6f 72 6b 2c 20 73 6f 20 74 68 65 20 50 72 6f 6a	ork, so the Proj				
0070	65 63 74 20 61 66 64 20 79 6f 75 21 29 20 63	ect (and you!) c				
0080	61 6e 20 63 6f 70 79 20 61 6e 64 0d 0a 64 69 73	an copy and dis				
0090	74 72 69 62 75 74 65 20 69 74 20 69 66 20 74 68	tribute it in th				
00a0	65 20 55 6e 69 74 65 64 20 53 74 61 74 65 73 20	e United States				
00b0	77 69 74 68 70 65 72 6d 69 73 73 69	without permissi				
00c0	6f 6e 20 61 6e 64 0d 0a 77 69 74 68 6f 75 74 20	on and without				
00d0	70 61 79 69 6e 67 20 63 6f 70 79 72 69 67 68 74	paying c opyright				
00e0	20 72 6f 79 61 6c 74 69 65 73 2e 20 20 53 70 65	royalti es. Spe				

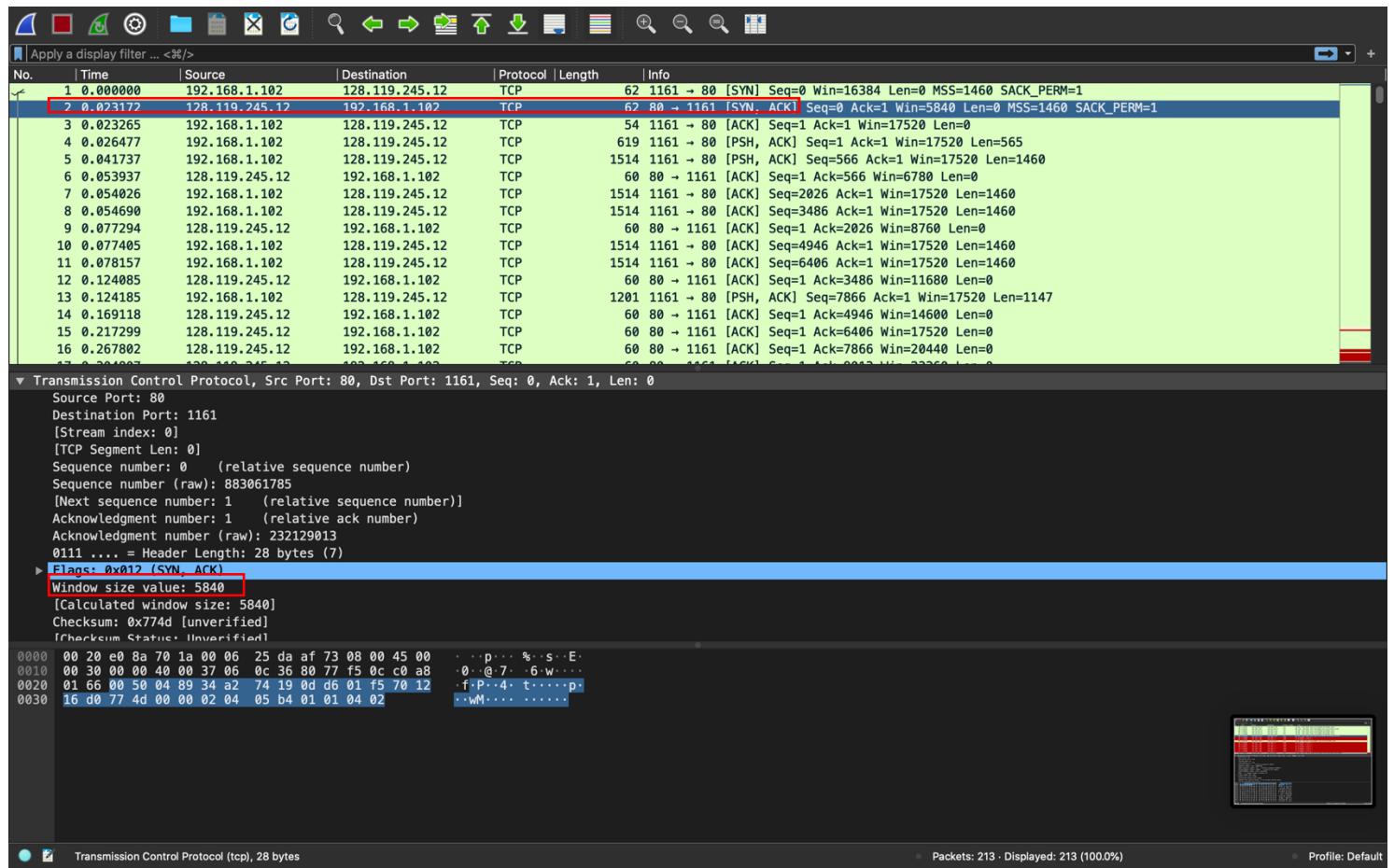
# COMPUTER NETWORK ORGANIZATION

## Lab 2

9. What is the minimum amount of available buffer space advertised at the received for the entire trace? Does the lack of receiver buffer space ever throttle the sender?

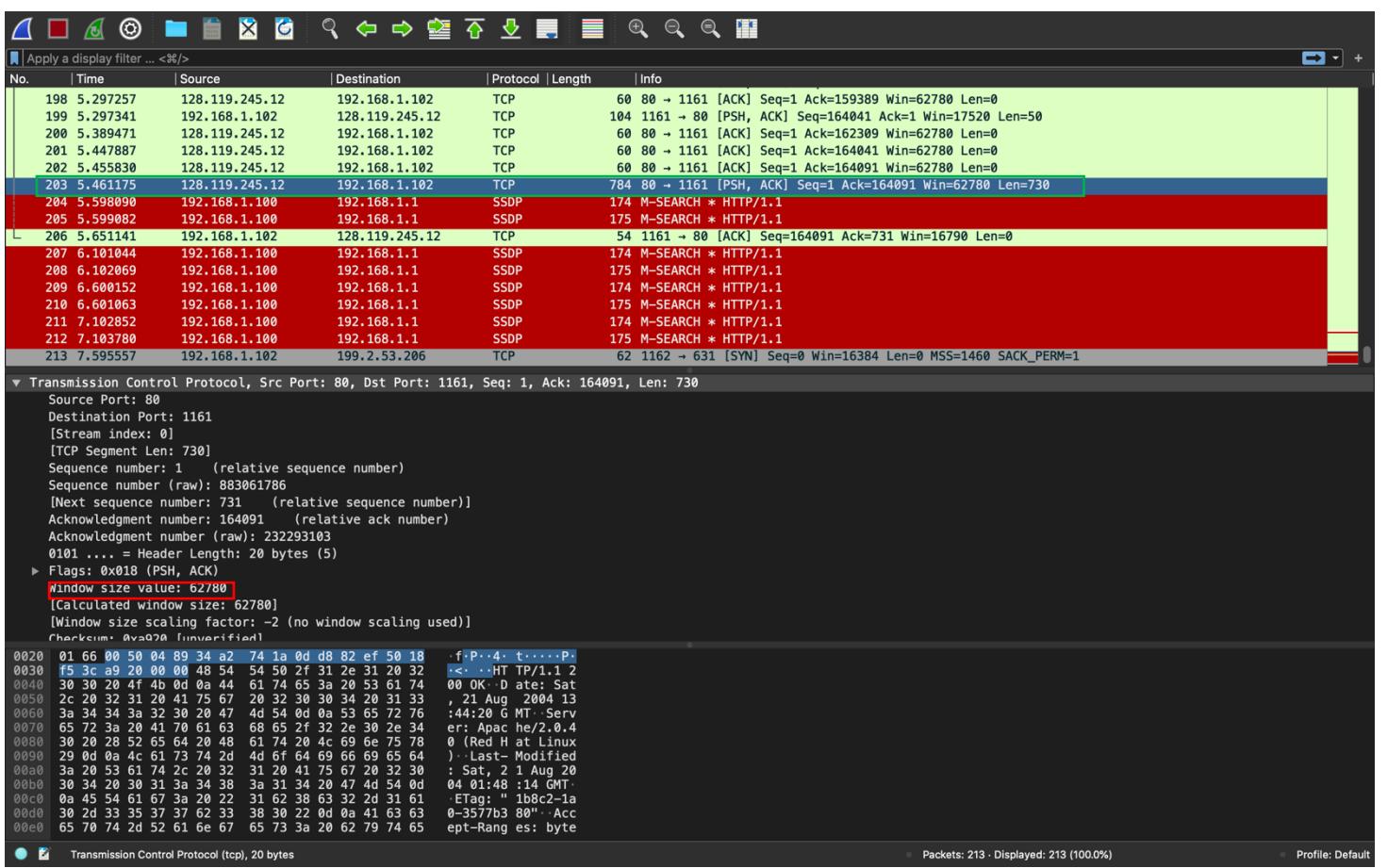
Answer : The minimum amount of available buffer space advertised at the received for the entire trace is 5840 bytes.

Receiver buffer space doesnot throttle because the maximum window size of the receiver is 62780 bytes.



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## Lab 2



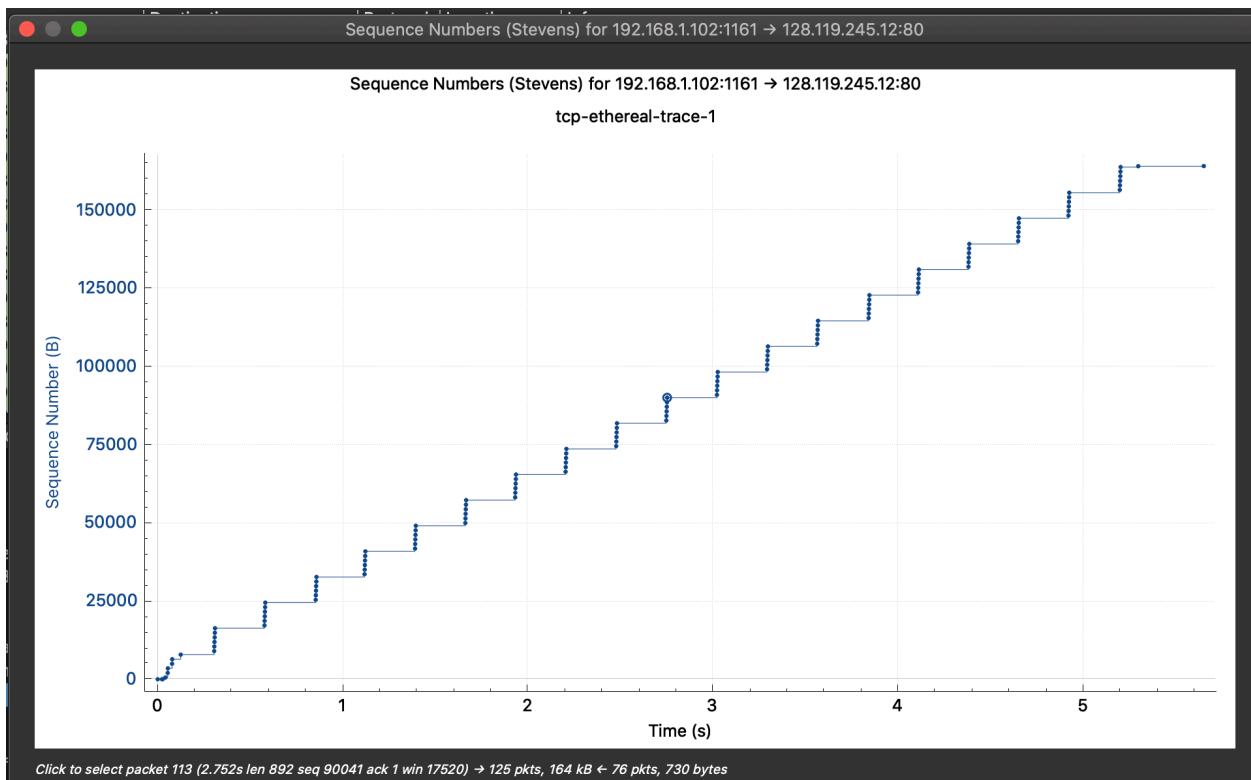
10. Are there any retransmitted segments in the trace file? What did you check for (in the trace) in order to answer this question?

Answer :

No, There are no retransmitted segment in the trace file. We can check this by looking at the Time – Sequence Graph. There is a increase in Sequence number with increase in time.

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## Lab 2



11. How much data does the receiver typically acknowledge in an ACK? Can you identify cases where the receiver is ACKing every other received segment (see Table 3.2 on page 250 in the text).

Answer :

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

Eg : Ack 1 = 566 and ACK 2 = 2026 ( From Packet Capture )

So the Acknowledged data is ( Ack 2 – Ack 1 ) =  $2026 - 566 = 1460$  .

Yes, There are instances where the receiver is Acking every other received segment .

For eg : No: 87 acknowledges every other segments it received .

No.	Time	Source	Destination	Protocol	Length	Info
75	1.664198	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=54353 Ack=1 Win=17520 Len=1460
76	1.665254	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=55813 Ack=1 Win=17520 Len=1460
77	1.666151	192.168.1.102	128.119.245.12	TCP	946	1161 → 80 [PSH, ACK] Seq=57273 Ack=1 Win=17520 Len=892
78	1.758227	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=52893 Win=62780 Len=0
79	1.860063	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=55813 Win=62780 Len=0
80	1.930880	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=58165 Win=62780 Len=0
81	1.931099	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=58165 Ack=1 Win=17520 Len=1460
82	1.931879	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=59625 Ack=1 Win=17520 Len=1460
83	1.932757	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=61085 Ack=1 Win=17520 Len=1460
84	1.933636	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=62545 Ack=1 Win=17520 Len=1460
85	1.934770	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=64005 Ack=1 Win=17520 Len=1460
86	1.935586	192.168.1.102	128.119.245.12	TCP	946	1161 → 80 [PSH, ACK] Seq=65465 Ack=1 Win=17520 Len=892
87	2.029069	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=61085 Win=62780 Len=0
88	2.126682	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=64005 Win=62780 Len=0
89	2.203195	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=66357 Win=62780 Len=0
90	2.203411	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=66357 Ack=1 Win=17520 Len=1460

▶ Frame 87: 60 bytes on wire (480 bits), 60 bytes captured (480 bits)  
 ▶ Ethernet II, Src: LinksysG\_da:af:73 (00:06:25:da:af:73), Dst: Actionte\_8a:70:1a (00:20:e0:8a:70:1a)  
 ▶ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102  
 ▶ Transmission Control Protocol, Src Port: 80, Dst Port: 1161, Seq: 1, Ack: 61085, Len: 0

```

  Source Port: 80
  Destination Port: 1161
  [Stream index: 0]
  [TCP Segment Len: 0]
  Sequence number: 1 (relative sequence number)
  Sequence number (raw): 883061786
  Next sequence number: 1 (relative sequence number)
  Acknowledgment number: 61085 (relative ack number)
  Acknowledgment number (raw): 232190097
  0101 .... = Header Length: 20 bytes (5)
  Flags: 0x010 (ACK)
  Window size value: 62780
  
```

```

0000  00 20 e0 8a 70 1a 00 06 25 da af 73 08 00 45 00  · · · · % · · E ·
0010  00 28 58 94 40 00 37 06 b3 a9 80 77 f5 0c c0 a8  · (X @ 7 · · w ·
0020  01 66 00 50 04 89 34 a2 74 1a 0d d6 f0 91 50 10  · f P · 4 · t · · · p ·
0030  f5 3c d7 07 00 00 e1 6d 00 00 dc 1c  · < · · m · · ·
  
```

Transmission Control Protocol (tcp), 20 bytes

Packets: 213 - Displayed: 213 (100.0%)

Profile: Default

## COMPUTER NETWORK ORGANIZATION

### Lab 2

12. What is the throughput (bytes transferred per unit time) for the TCP connection?

Explain how you calculated this value.

Answer : The average throughput for this TCP connection is the ratio between the total amount data and the total transmission time.

Total Data Transmitted = Difference between the Acknowledge Sequence Number of last Ack and Sequence Number of first TCP segment (  $164091 - 1 = 164090$  )

Total Transmission Time = Difference between time instance of last ack and time instance of first segment (  $5.455830 - 0.026477 = 5.4294$  seconds )

Average throughput =  $164090/5.4294 = 30.222$  KB/sec.

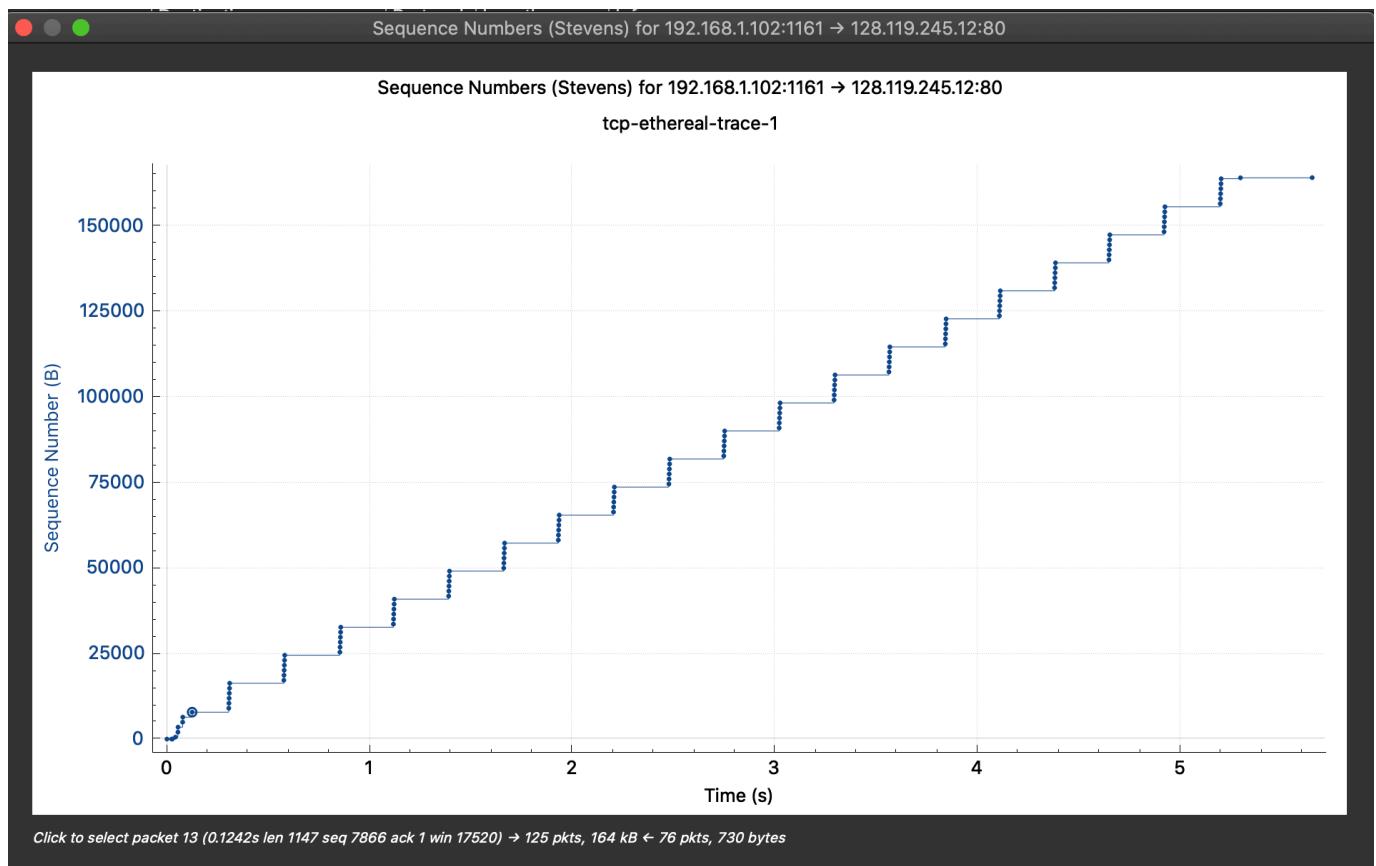
13. Use the *Time-Sequence-Graph(Stevens)* plotting tool to view the sequence number versus time plot of segments being sent from the client to the gaia.cs.umass.edu server. Can you identify where TCP's slowstart phase begins and ends, and where congestion avoidance takes over? Comment on ways in which the measured data differs from the idealized behavior of TCP that we've studied in the text.

Answer : Slow start begin from around 0 and ends at around 0.12sec and then congestion avoidance takes over.

The measured data is only using a fraction of the window size instead of the idealized one third to a half.

# COMPUTER NETWORK ORGANIZATION

## Lab 2



14. Answer each of two questions above for the trace that you have gathered when you transferred a file from your computer to gaia.cs.umass.edu .

Answer : All the questions above have been answered.