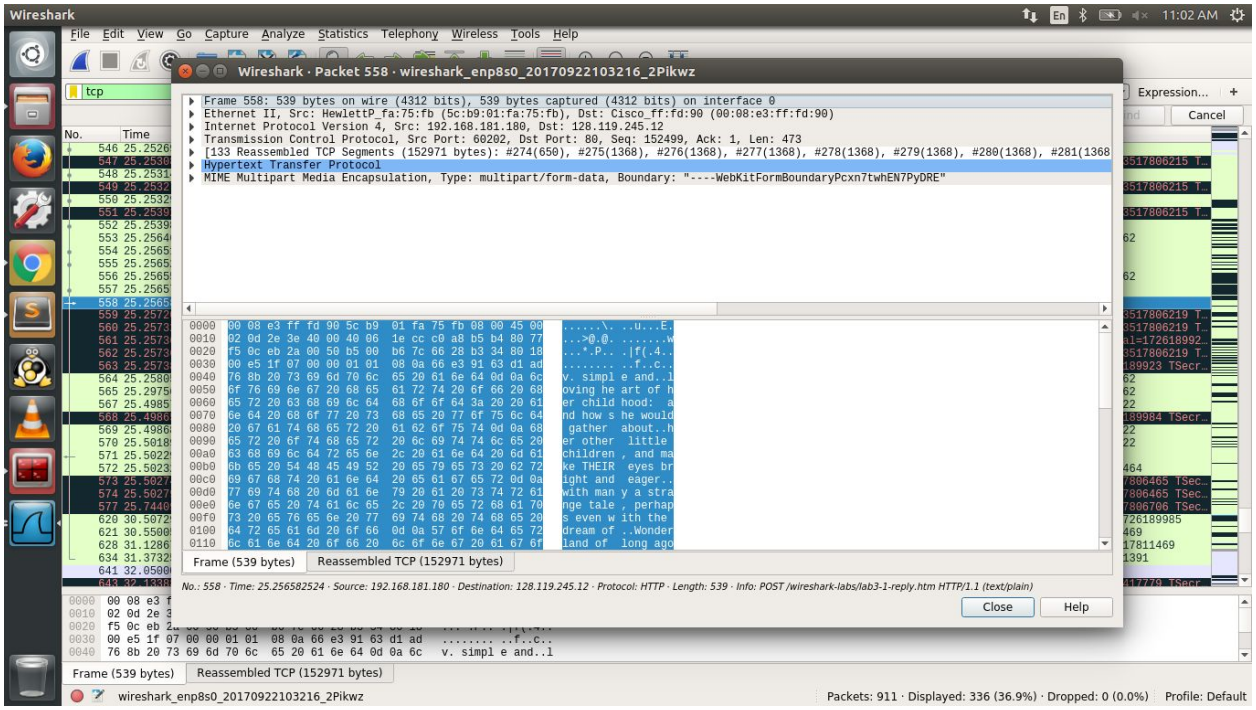
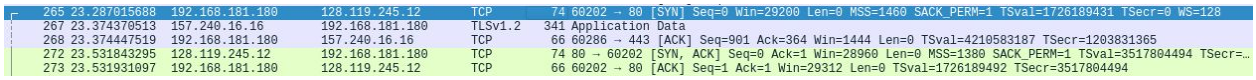
Screenshot for ans 1 -3 :



1. **IP address and port no of client:** 192.168.181.180:60202
2. **IP address and port no of destination:** 128.119.245.12
3. **IP address and port no of client:** 192.168.181.180:60202
4. **Screenshot for ans 4 and 5:**
   a.



   b. **Sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and gaia.cs.umass.edu is**: 0
   c. The SYN flag is set to 1 and it indicates that this segment is a SYN segment.
5.
   a. **Sequence number of the SYNACK segment sent by gaia.cs.umass.edu to the client computer in reply to the SYN:** 0
   b. **Value of the ACKnowledgement field in the SYNACK segment**: 1
   c. **How did gaia.cs.umass.edu determine that value? :** The value of ACKnowledgement field in the SYNACK segment is determined by adding 1 to the initial sequence number of SYN segment from client computer.
   d. **What is it in the segment that identifies the segment as a SYNACK segment?** Both the SYN and ACK flags are set to 1 and it indicates that this segment is SYNACK segment.
6. **Sequence number of the TCP segment containing the HTTP POST command: 1**

7. **Estimated RTT**

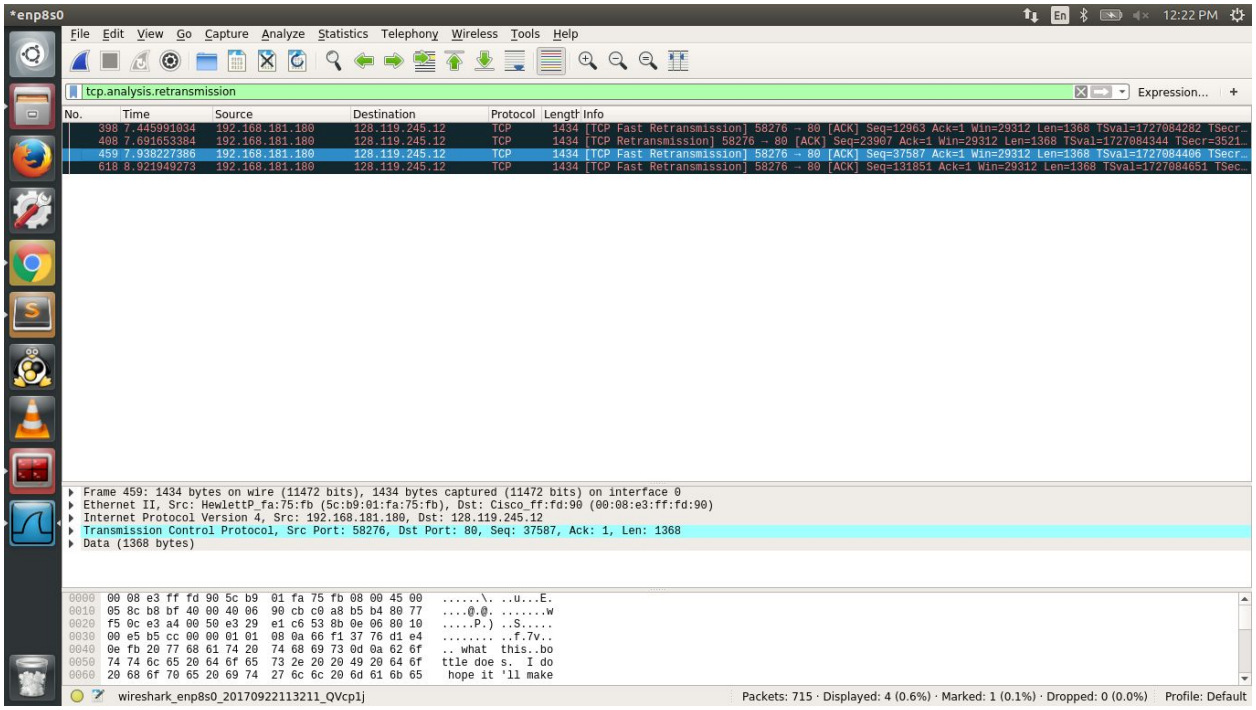
Sequence number	Send Time	ACK receive ti	RTT	Estimated RTT
1	7.198614351	7.443436489	0.244822138	0.244822138
651	7.198928502	7.444116981	0.245188479	0.2448679306
2019	7.198950673	7.444126851	0.245176178	0.2449064615
3387	7.198997762	7.444241569	0.245243807	0.2449486297
4755	7.199006036	7.444303138	0.245297102	0.2449921888
6123	7.199172341	7.444434258	0.245261917	0.2450259048

8. **Length of first six TCP segments:**

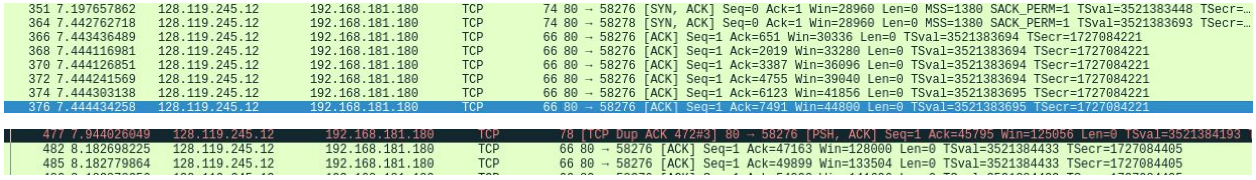
TCP sequence No.	Length
1	650
651	1368
2019	1368
3387	1368
4755	1368
6123	1368

9. **The minimum amount of available buffer space advertised at the received for the entire trace is**: 28960 bytes. The sender is **Never** throttled for the entire trace due to lack of receiver buffer because minimum window size is > segment size.

10. Yes, there are retransmitted segments in the trace file. I checked for it using the filter tcp.analysis.retransmit .



11. Following is the data for acknowledgements:



	ACK number	**Acknowledged data**
ACK 1	651	651
ACK 2	2019	1368
ACK 3	3387	1368
ACK 4	4755	1368
ACK 5	6123	1368
. . .		

ACK 24	47163	1368
ACK 25	49899	2736

So, typically an ACK acknowledges 1368 bytes(i.e. 1 Segment size) of data. But there are cases where receiver is ACKing more than one segment at a time (eg ACK 25).

12.

Total data transmitted = **Last acknowledge no. - First sequence no.** = 152973 - 1 = 152392 B

Total transmission Data = receive time of last ACK - Sending time of first segment

= 15.068796922 - 7.198614341 = 7.87018258 s

Throughput = 152392 Bytes/ 7.87018258 s = 19.3632102 KB/sec

Note: Whole trace is in zip file.