Networks Assignment

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Answers to questions are below. All screenshots will be right at the end of the document. Screenshots can also be found in the folder “Screenshots” where each image name refers to the question.

Client/Server Exercises:

2. Yes, got it working over multiple lab machines. Connected to VHLAND002 server which was edited to display IP of each user that connects. We made a user called “spectator” join first in order to screenshot the other users that joined with their IP displayed.

3. GUIchat has one interface for both the server and client. Guichat allows the user to enter the host IP on the interface.

4. Guichat in section 2.2 has a gui interface while the client/server application in section 2.1 runs in the terminal. The Guichat can host and allow the user to be a client while the client/server application can only run the server or client in the terminal. To run both client and server, two terminals would need to be open. The GuiChat can only be used for a 2-way chat where the client/server application in section 2.1 can have multiple clients connect to the server. The Guichat application allows you to choose a port where as the client/server application in section 2.1 has a hard coded port number of 2222 in the server class.

TCP Wireshark Exercises:

5. Client I.P: 196.42.65.135
   Client TCP port number: 56355

6. Server I.P: 128.119.245.12
   Server TCP port number: 80

7. Seq = 0. The flag is set to 1 for Syn: Set.

8. Seq = 0. Ack = 1. Syn and Ack flags are both set to 1.

9. Sequence number = 1

10.

Segment	Sequence	Sent Time	Arrival Time	RTT Value	EstimatedRTT
1	1	0.035672000	0.066322000	0.030650000	0.03065
2	1461	0.035689000	0.066604000	0.030915000	0.030683125
3	2921	0.035699000	0.066744000	0.031045000	0.03072835938
4	4381	0.035710000	0.066880000	0.031170000	0.03078356445
5	5841	0.066439000	0.076044000	0.009605000	0.0281362439
6	7301	0.066452000	0.076618000	0.010166000	0.02588996341

11. 1. Length = 1460
    2. Length = 1460
    3. Length = 1460
    4. Length = 1460
    5. Length = 1460
    6. Length = 1460

12. Minimum buffer space = 5840.
    Yes, tcp windows full messages on wireshark.

13. Yes, in the flow graph at the end, there is a duplicate for seq = 1461.

<u>IP Wireshark Exercises:</u>

14. Source IP: 196.42.65.228

15. Protocol: ICMP (1)

16. IP Header length = 20. Total length – header length. Payload is 56-20 = 36.

17. Fragment offset = 0

18. Time to live decrements as you go down the list and Identification decrements meaning as time increases, the time to live increases and the identification number increases.

19. Stay constant: version, Header length, Differential Services Field, Total Length, Flags, Fragment offset, Protocol, source, destination, Source GeoIP, Destination GeoIP.
    Must stay constant: version, Header length, Differential Services Field, Total Length, Flags, Fragment offset, Protocol, source, destination, Source GeoIP, Destination GeoIP.
    Must change: Identification, Time to live, Header checksum. Each ICMP needs a unique identification.

20. Identification increments as time increases.

21. ICMP TTL-exceeded replies were found by looking at the black highlighted rows with a green font. In the Info column it says “Time-to-live exceeded (Time to live exceeded in transit)”. The IP source is their IP and IP destination in my IP.
Identification: 0x52d6 (21206)
Time to live: 255

22. No, each ICMP TTL-exceeded has a unique identification value. The TTL values from the nearest hop is the same (255). ICMP TTL-exceeded replies need a unique identification.

Screenshots:

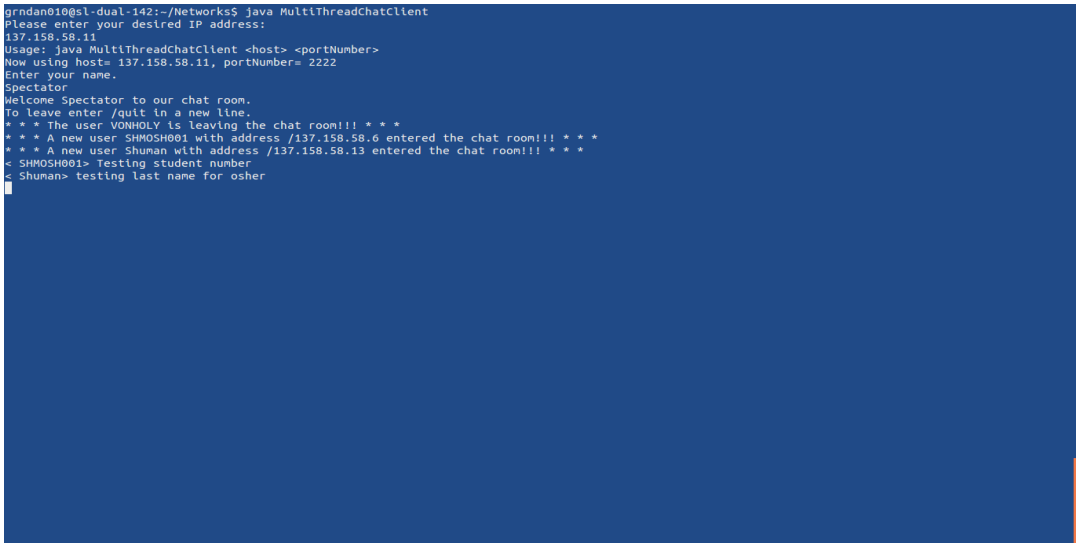

Figure 1: Question 2 screenshot

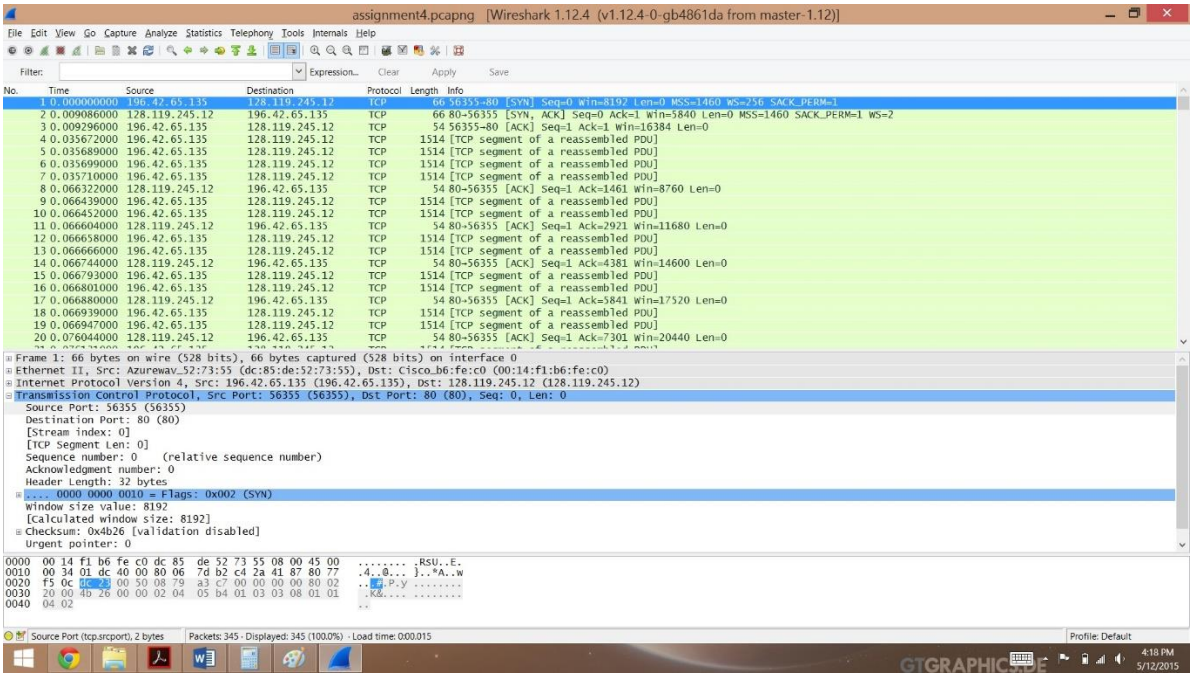

Figure 2: Question 5 & 6 screenshot

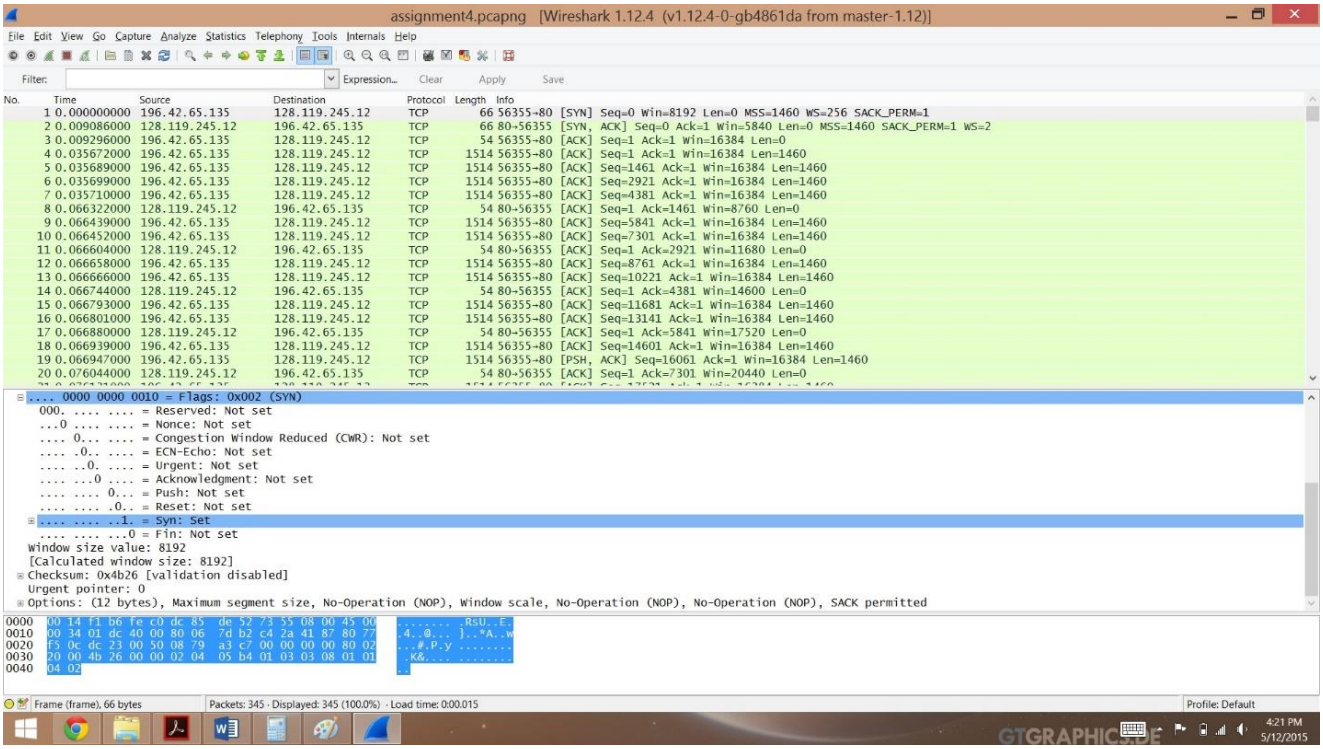

Figure 3: Question 7 screenshot

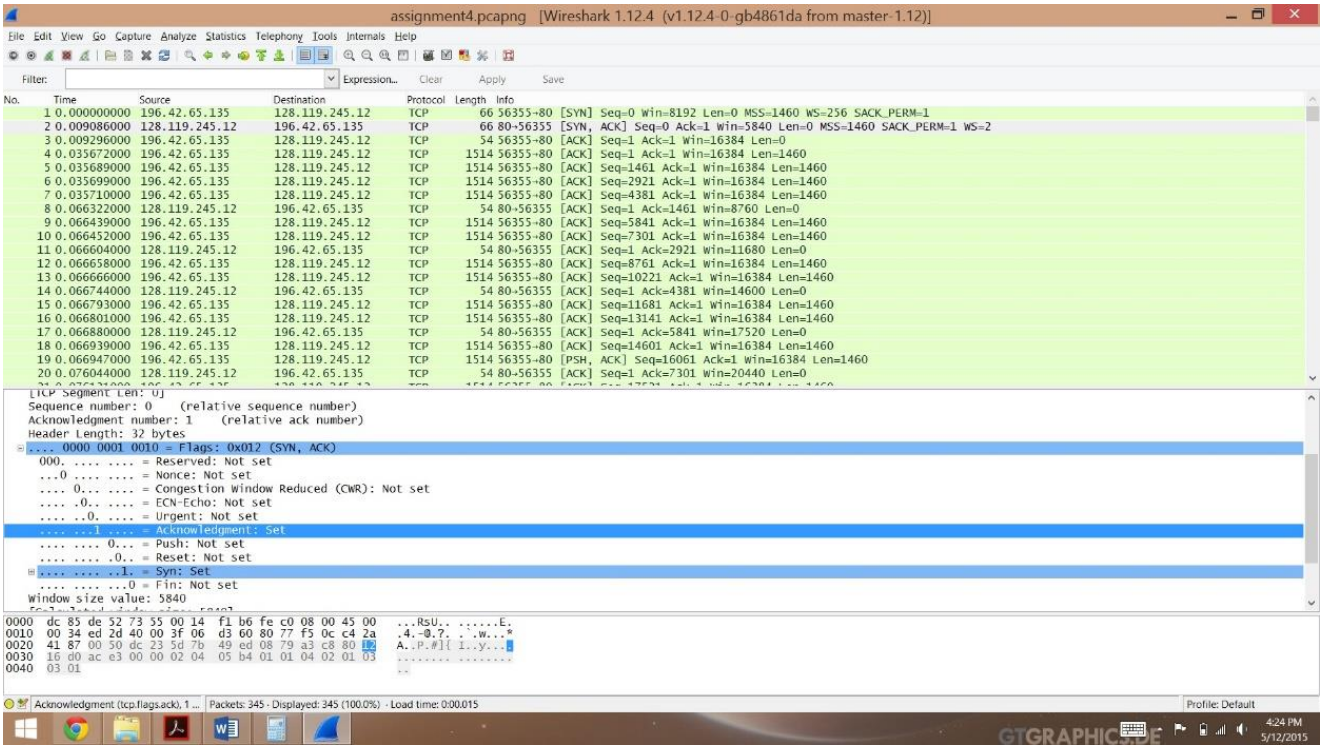

Figure 4: Question 8 screenshot

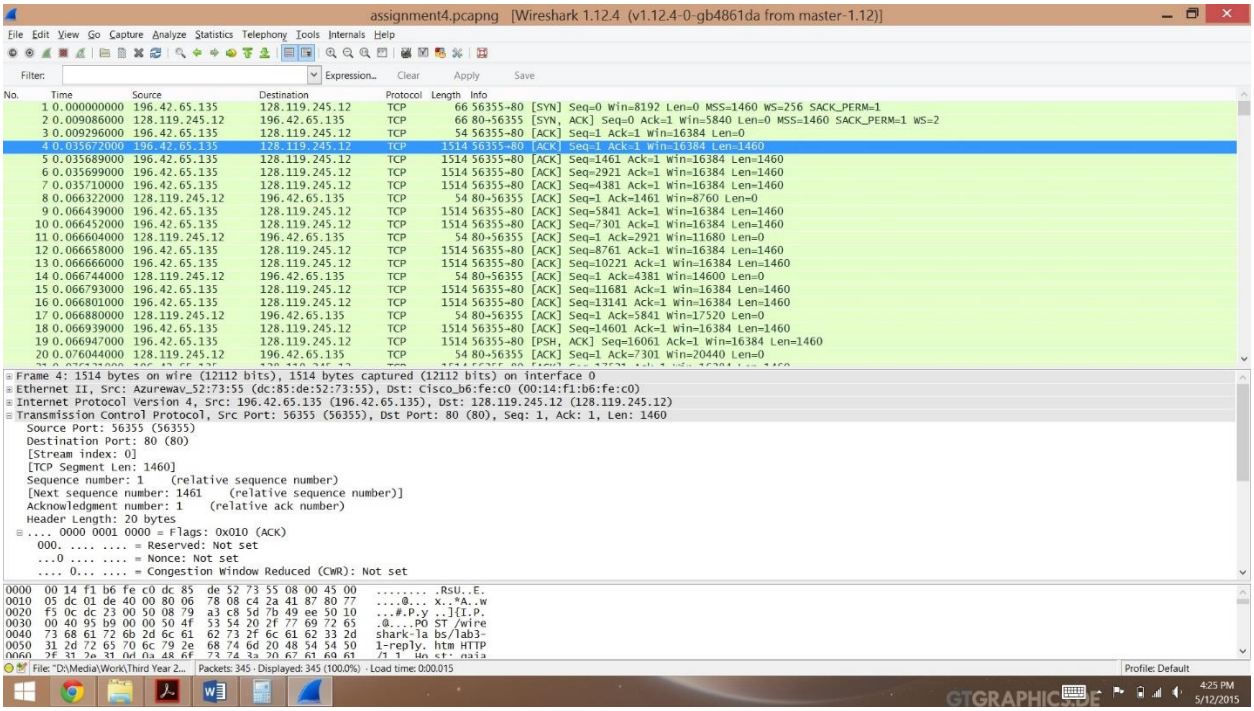

Figure 5: Question 9 screenshot

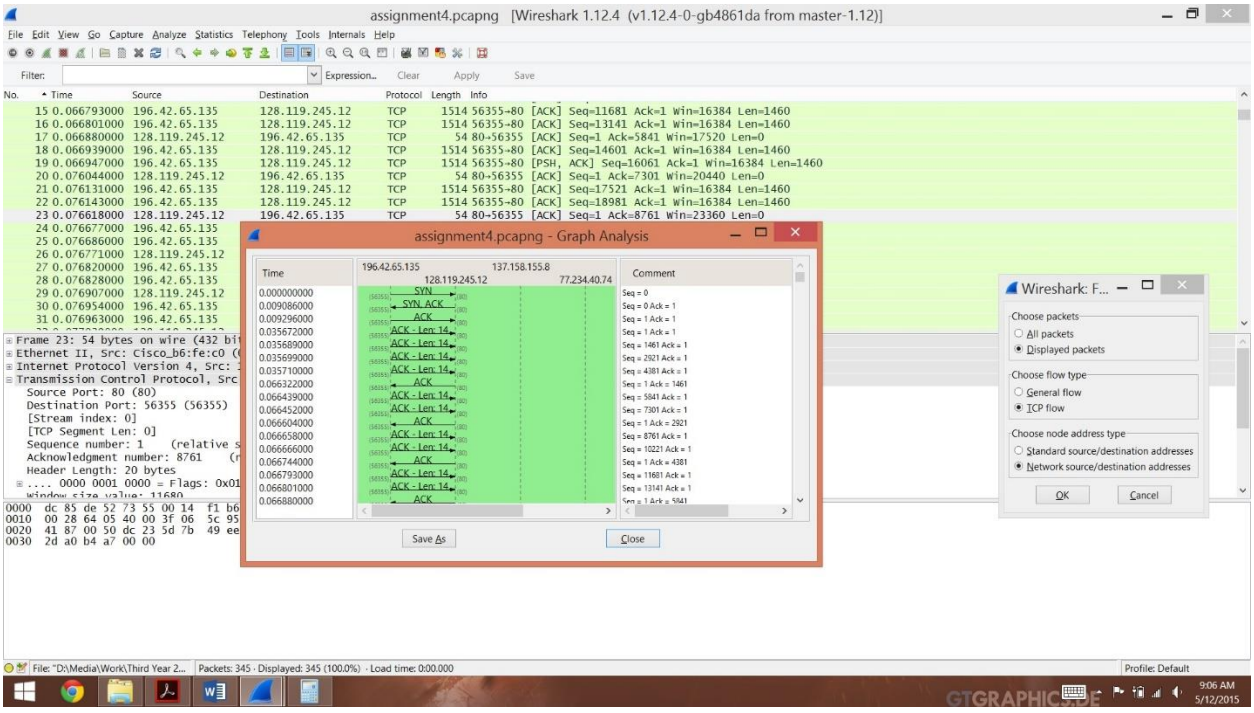

Figure 6: Question 10 screenshot

4	0.035672000	196.42.65.135	128.119.245.12	TCP	1514 56355→80 [ACK] Seq=1 Ack=1 Win=16384 Len=1460
5	0.035689000	196.42.65.135	128.119.245.12	TCP	1514 56355→80 [ACK] Seq=1461 Ack=1 Win=16384 Len=1460
6	0.035699000	196.42.65.135	128.119.245.12	TCP	1514 56355→80 [ACK] Seq=2921 Ack=1 Win=16384 Len=1460
7	0.035710000	196.42.65.135	128.119.245.12	TCP	1514 56355→80 [ACK] Seq=4381 Ack=1 Win=16384 Len=1460
8	0.066322000	128.119.245.12	196.42.65.135	TCP	54 80→56355 [ACK] Seq=1 Ack=1461 Win=8760 Len=0
9	0.066439000	196.42.65.135	128.119.245.12	TCP	1514 56355→80 [ACK] Seq=5841 Ack=1 Win=16384 Len=1460

Figure 7: Question 11 screenshot

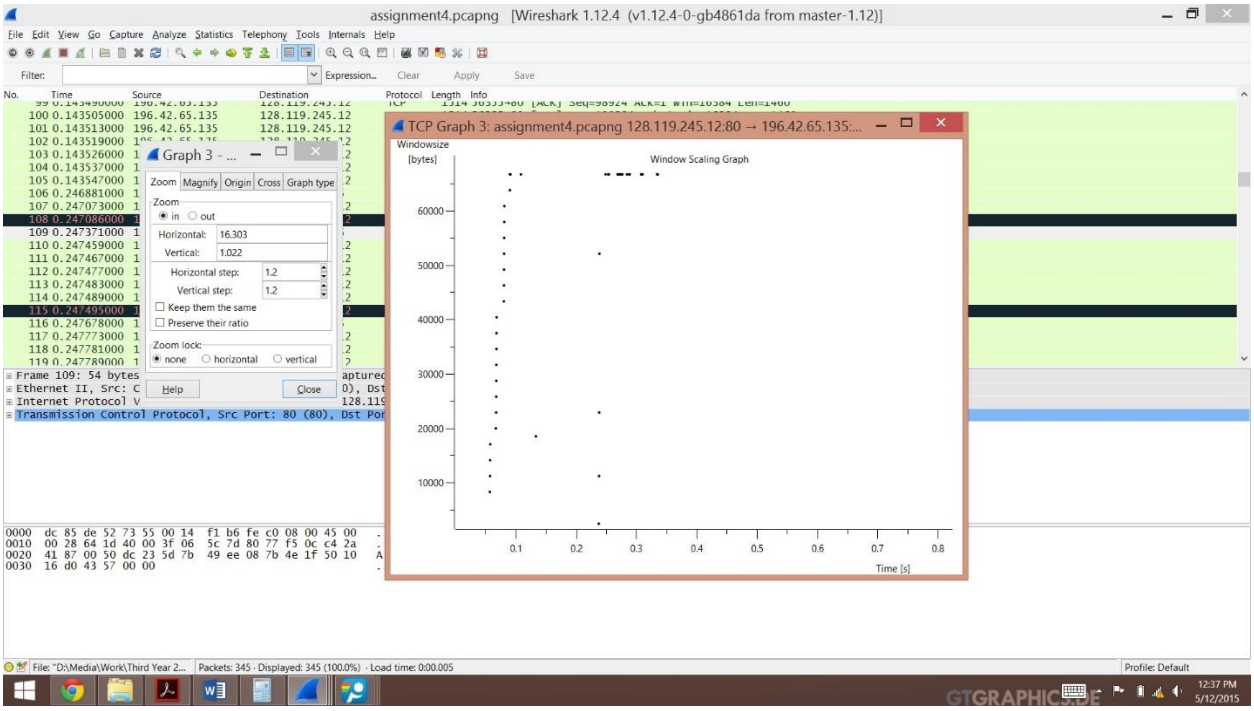

Figure 8: Question 12 screenshot

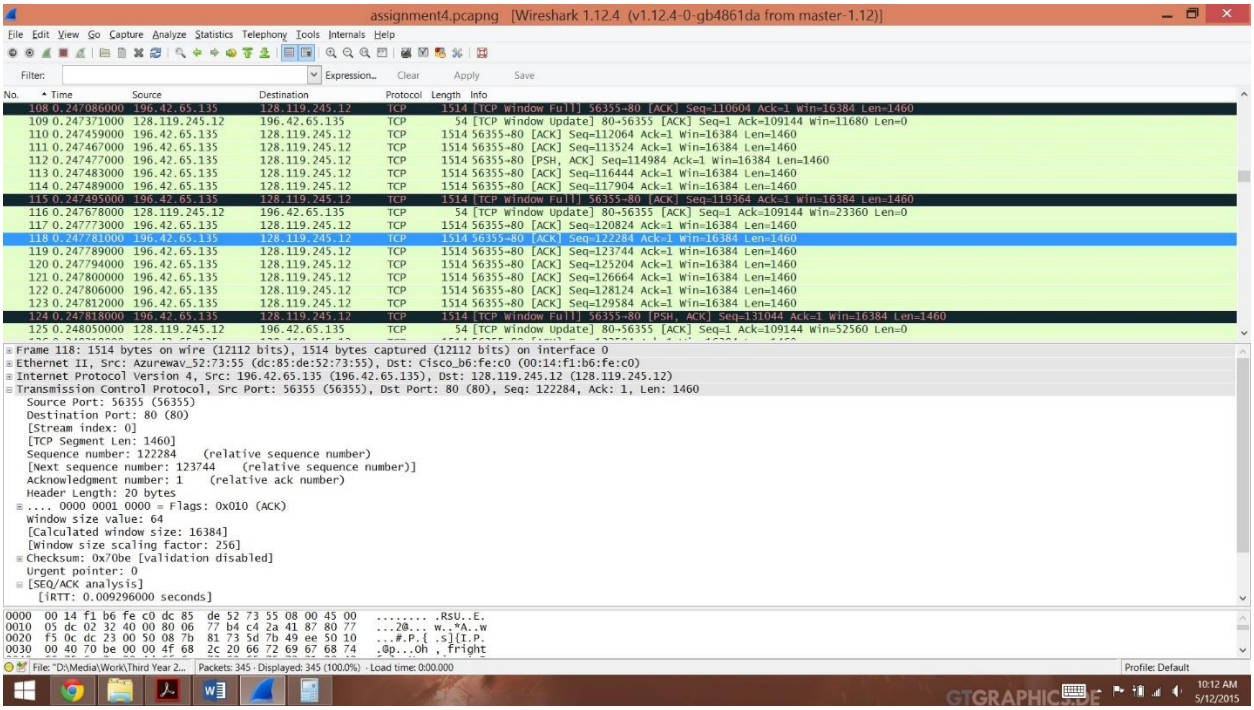

Figure 9: Question 12 screenshot

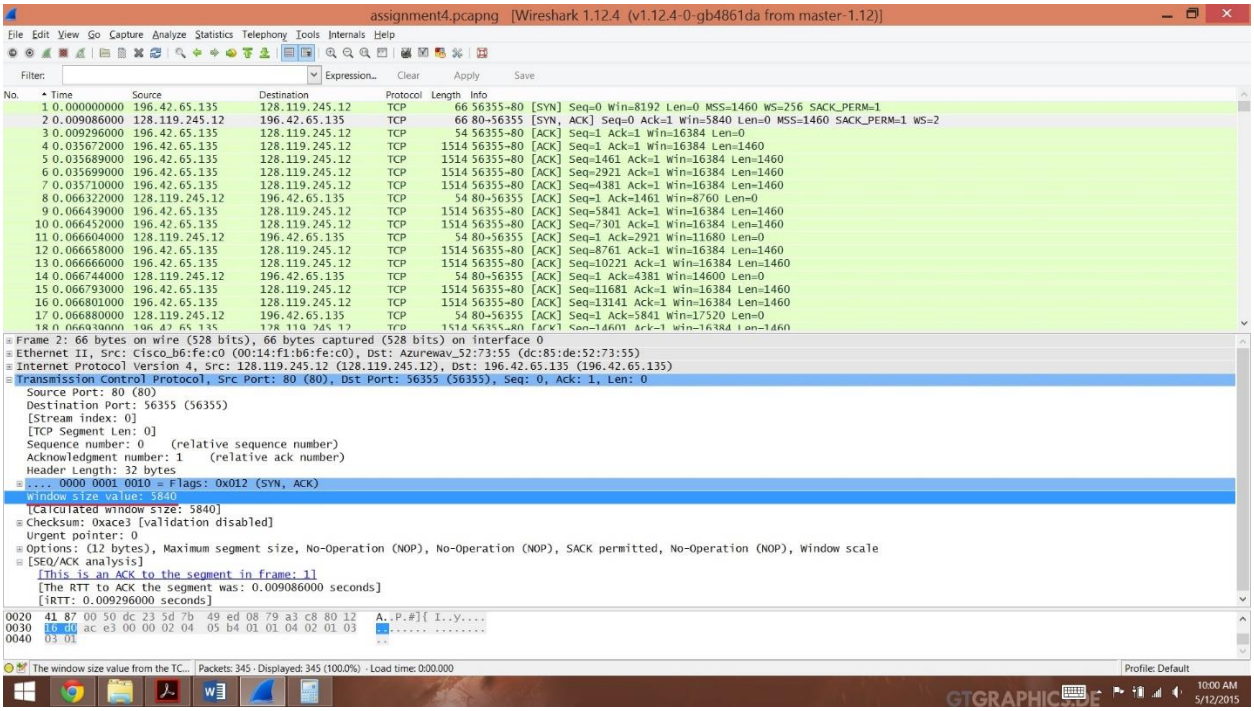

Figure 10: Question 12 screenshot

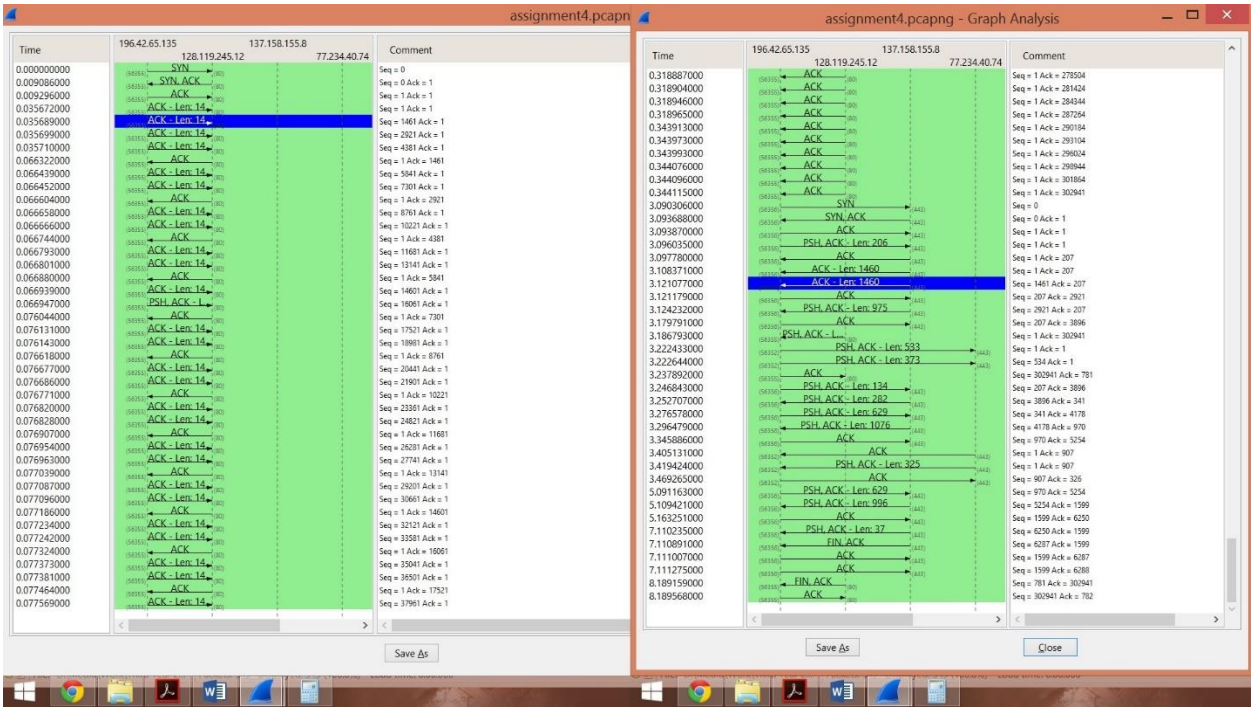

Figure 11: Question 13 screenshot

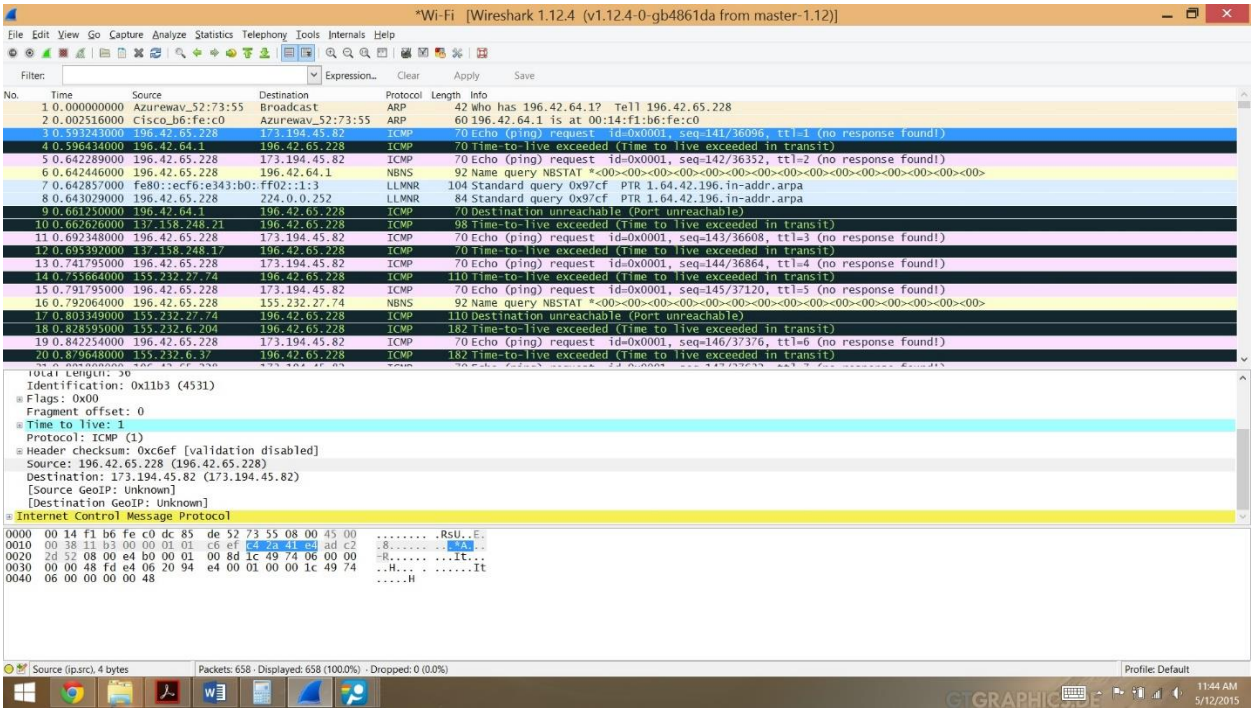

Figure 12: Question 14 screenshot

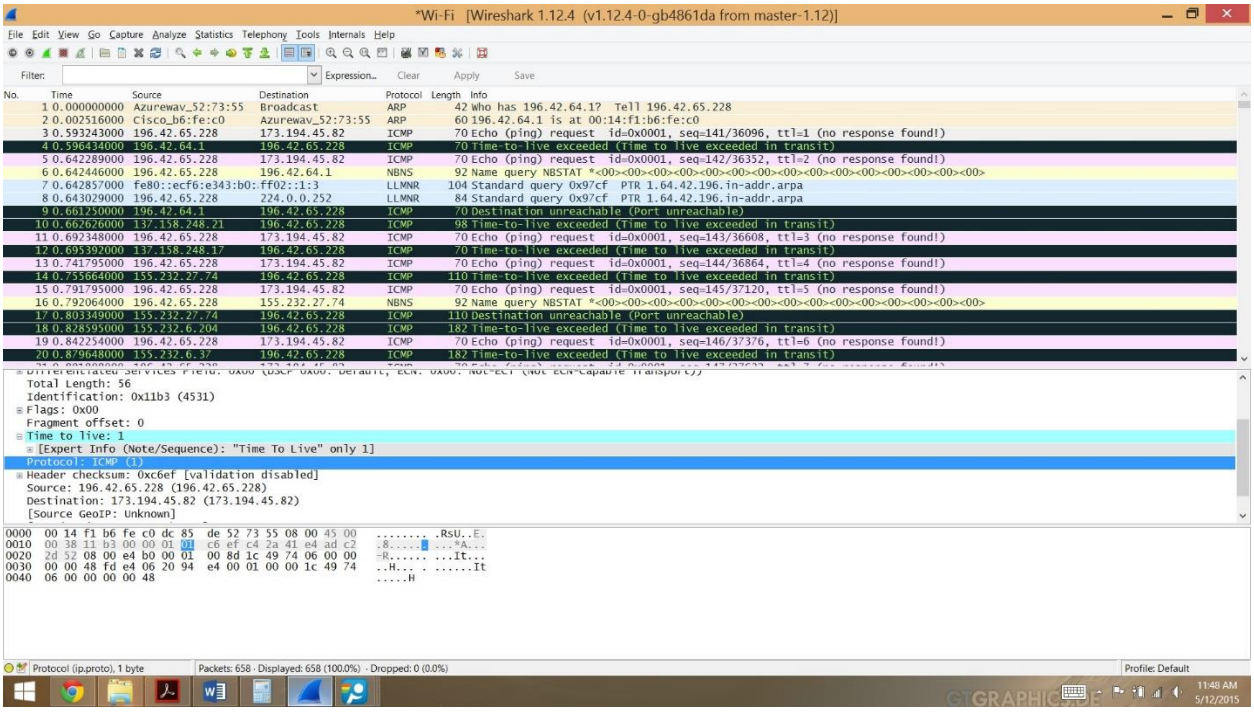

Figure 13: Question 15 screenshot

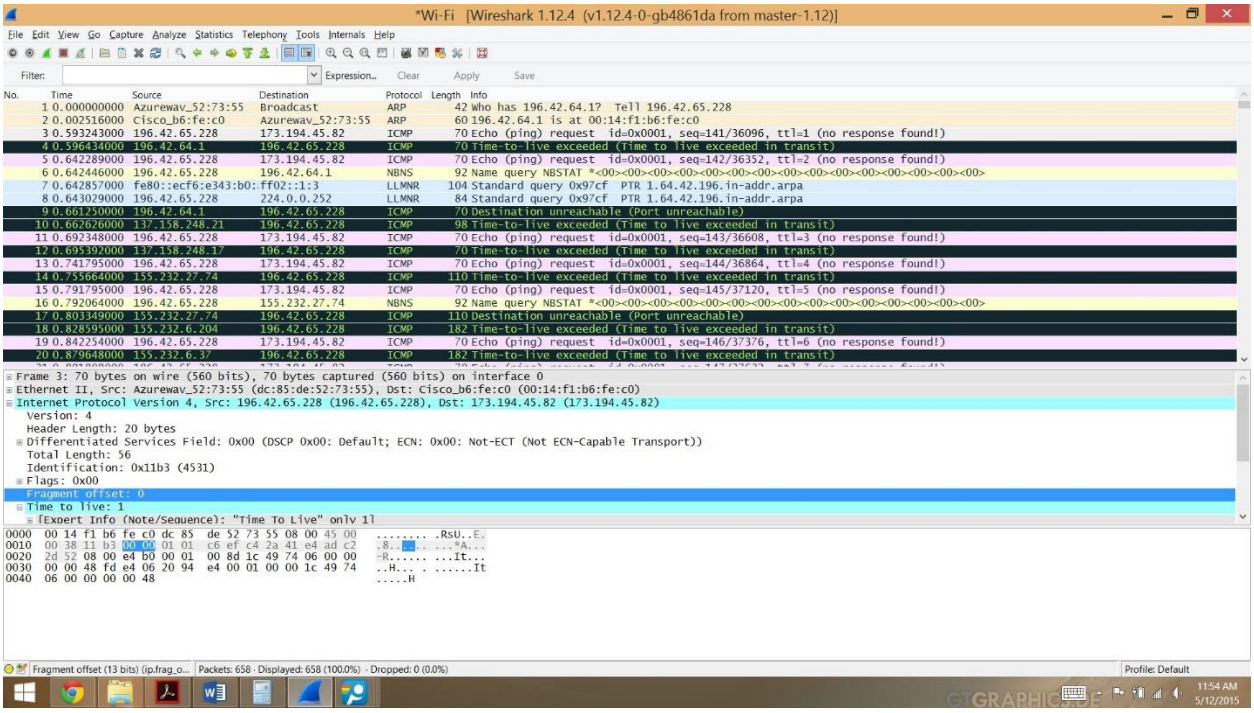

Figure 14: Question 16 screenshot

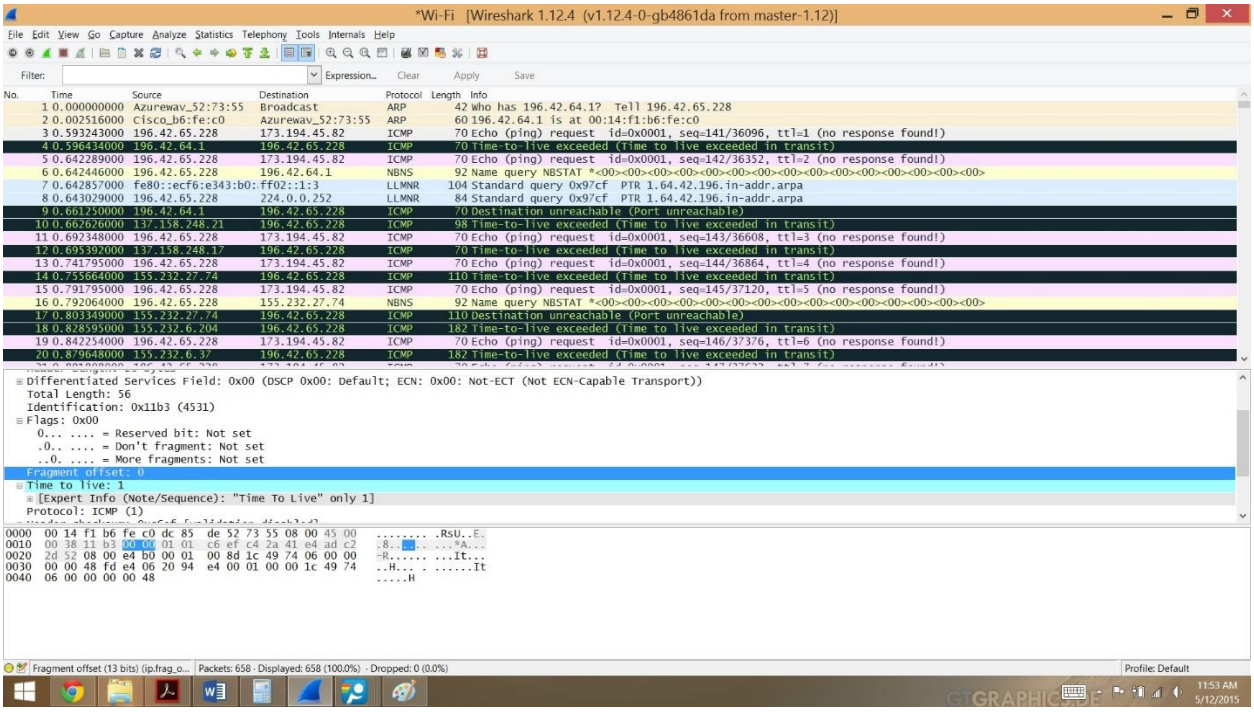

Figure 15: Question 17 screenshot

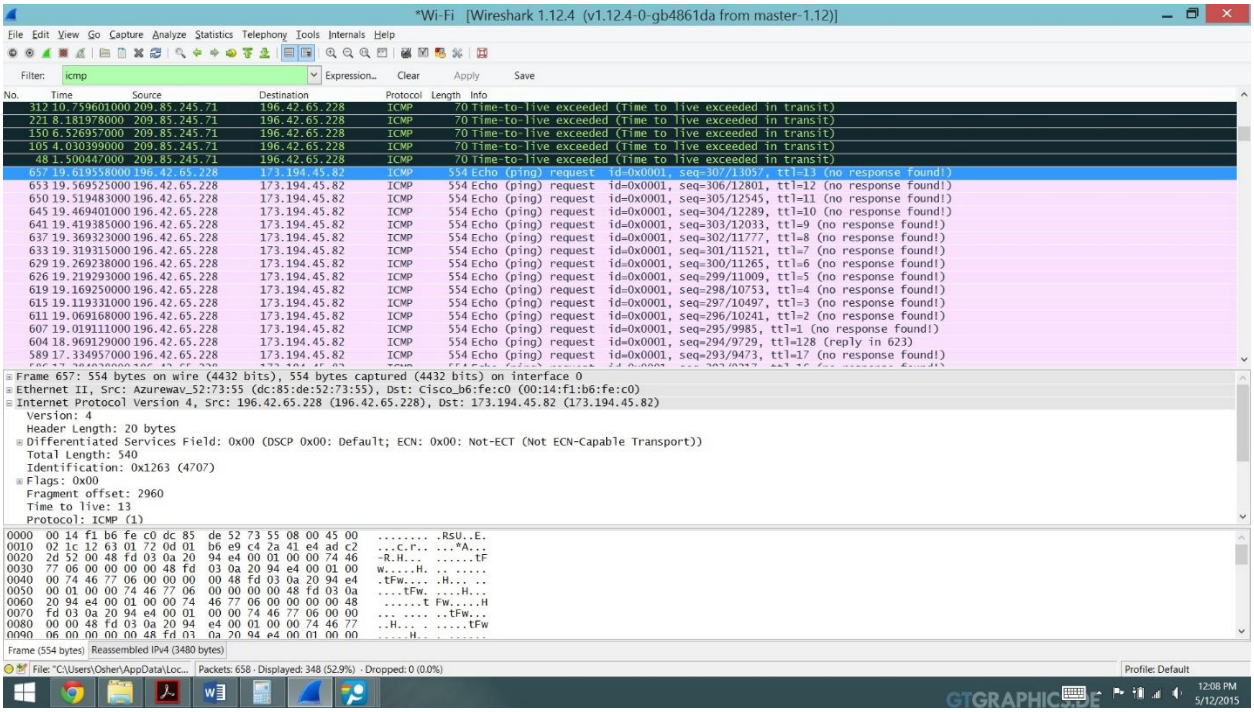

Figure 16: Question 18 screenshot

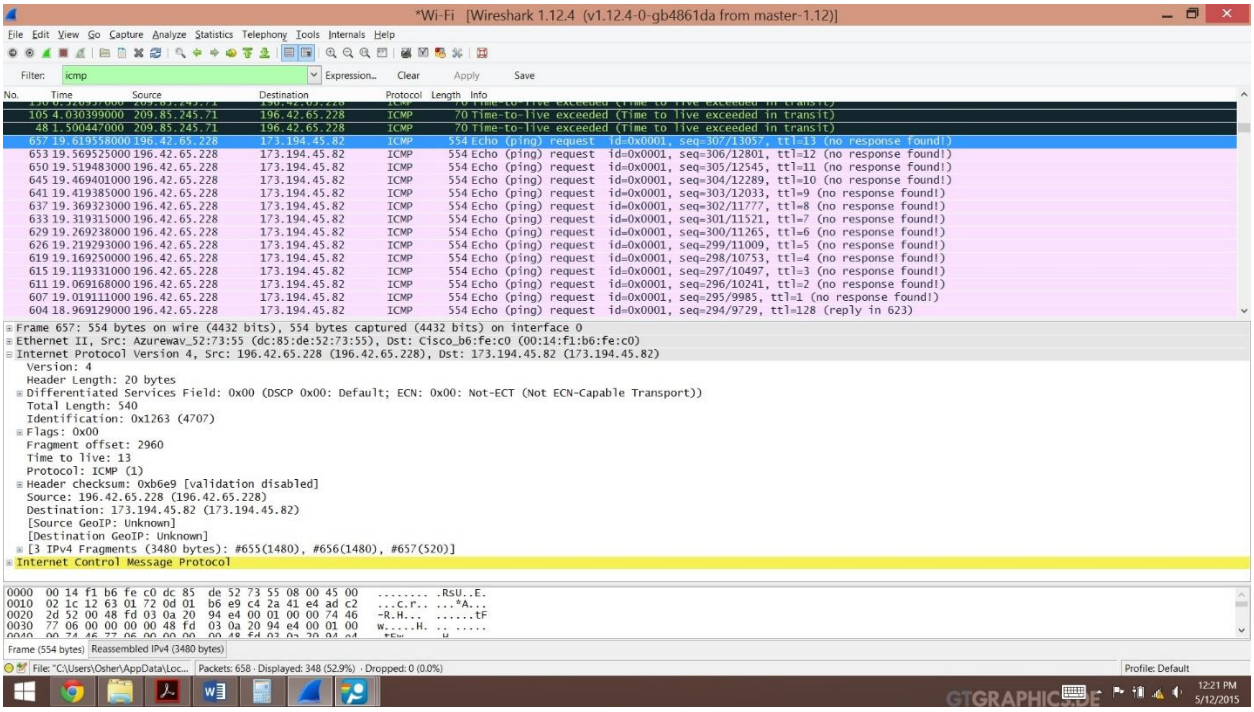

Figure 17: Question 19 screenshot

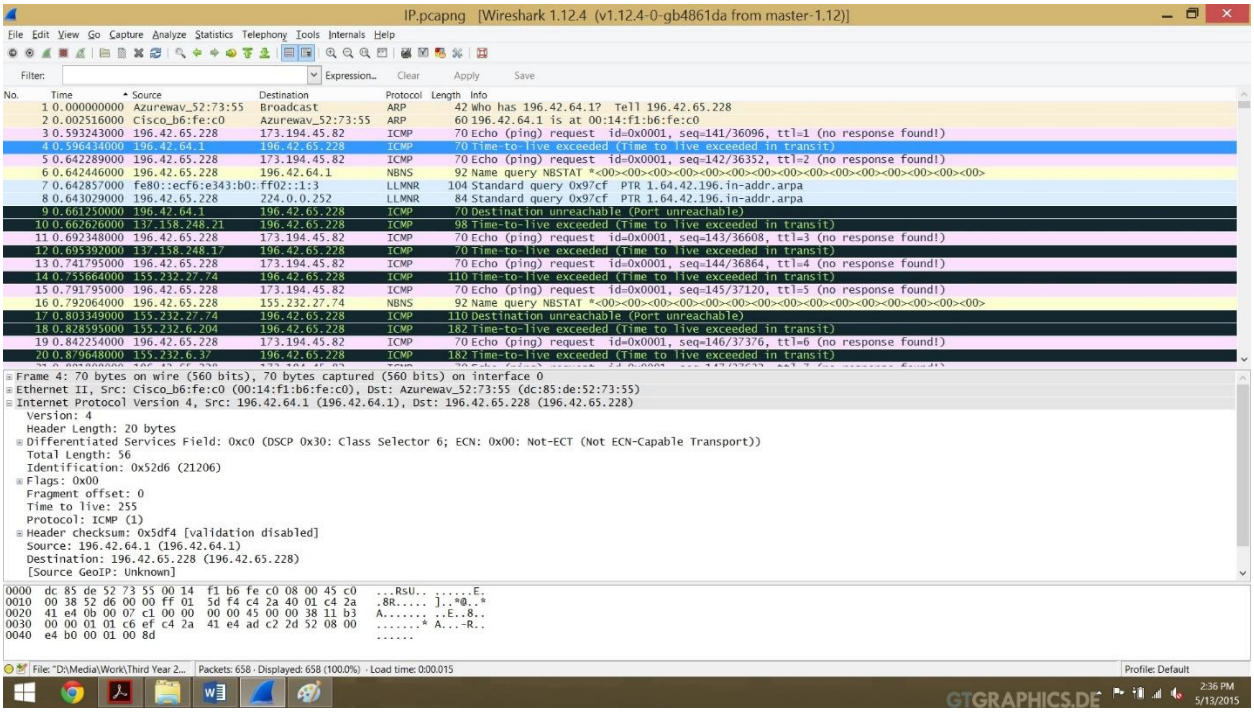

Figure 18: Question 21 screenshot

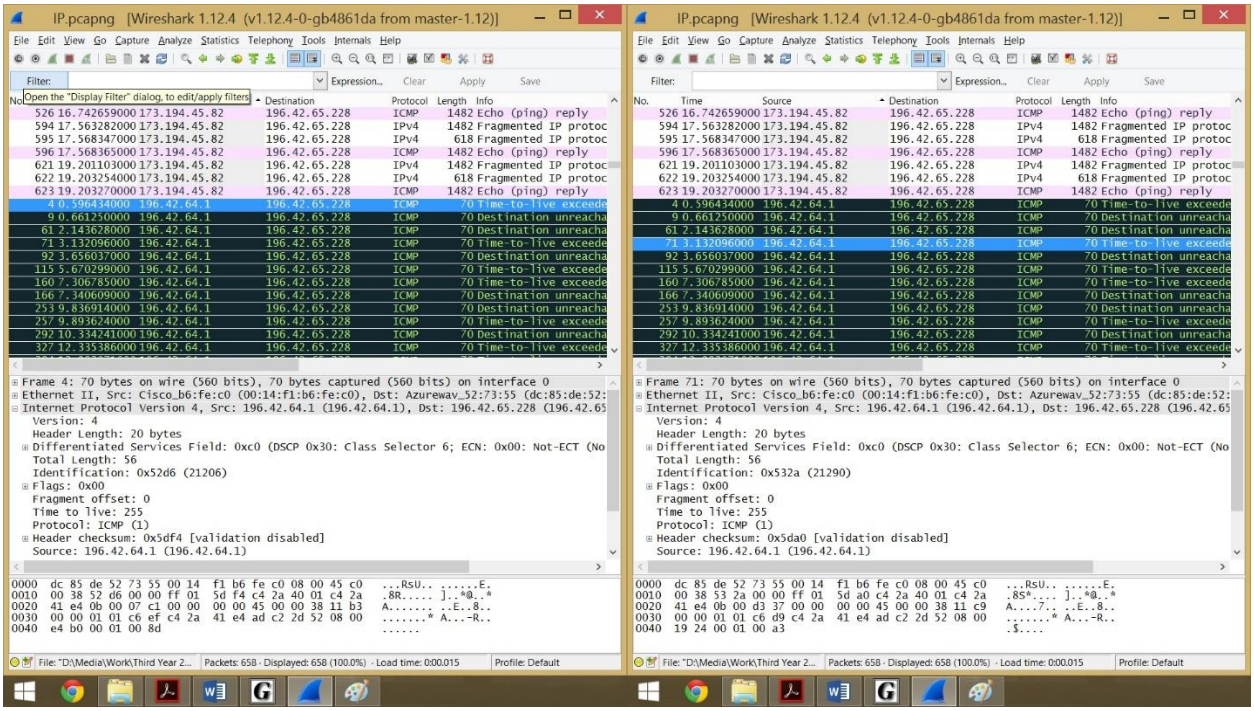

Figure 19: Question 22 screenshot