TCP

1.1. What is the IP address and TCP port number used by the client computer (source)that is transferring the alice.txt file to gaia.cs.umass.edu?

Ans: IP 192.168.86.68 port: 55639

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?

Ans: 128.119.245.12 80

3. 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 this TCP segment that identifies the segment as a SYN segment? Will the TCP receiver in this session be able to use Selective Acknowledgments (allowing TCP to function a bit more like a “selective repeat” receiver, see section 3.4.5 in the text)?

Ans: 4236649187
Syn flag - set/1
SACK - permitted in both syn and syn-ack

4.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 it in the segment that identifies the segment as a SYNACK segment? What is the value of the Acknowledgement field in the SYNACK segment? How did gaia.cs.umass.edu determine that value?

Ans: 1068969752
Syn flag & ack flag - set
4236649188
Ack = Sequence Number of received segment + Number of bytes received

5. 5. What is the sequence number of the TCP segment containing the header of the HTTP POST command? Note that in order to find the POST message header,you'll need to dig into the packet content field at the bottom of the Wireshark window, looking for a segment with the ASCII text "POST" within its DATA field4,5. How many bytes of data are contained in the payload (data) field of this TCP segment? Did all of the data in the transferred file alice.txt fit into this single segment?

Ans: 4236801228
1385 bytes
NO , content length 152359,

6. Consider the TCP segment containing the HTTP “POST” as the first segment in the data transfer part of the TCP connection.• At what time was the first segment (the one containing the HTTP POST) in the data-transfer part of the TCP connection sent?• At what time was the ACK for this first data-containing segment received?• What is the RTT for this first data-containing segment? • What is the RTT value of the second data-carrying TCP segment and its ACK?• What is the EstimatedRTT value (see Section 3.5.3, in the text) after the ACK for the second data-carrying segment is received? Assume that in making this calculation after the received of the ACK for the second segment,that the initial value of EstimatedRTT is equal to the measured RTT for the first segment, and then is computed using the EstimatedRTT equation on page 242, and a value of a = 0.125.

Arrival Time: Feb 3, 2021 08:43:26.840557000 +06
Arrival Time: Feb 3, 2021 08:43:26.716922000 +06
Rtt = 0.052671000 - 0.024047000
Rtt = 0.052676000 - 0.024048000
0.107sec

7. What is the length (header plus payload) of each of the first four data-carrying TCP segments?

Ans: 1448 + 32

8. What is the minimum amount of available buffer space advertised to the client by gaia.cs.umass.edu among these first four data-carrying TCP segments? Does the lack of receiver buffer space ever throttle the sender for these first four data-carrying segments?

Ans: 131712 bytes

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

Ans: No

10. How much data does the receiver typically acknowledge in an ACK among the first ten data-carrying segments sent from the client to gaia.cs.umass.edu? Can you identify cases where the receiver is ACKing every other received segment(see Table 3.2 in the text) among these first ten data-carrying segments?

Ans: 1448 bytes, No every time receiver ACKs every single segment

11. What is the throughput (bytes transferred per unit time) for the TCP connection?Explain how you calculated this value.

Ans: Throughput= Total Bytes transferred/Total time
Here, Total Bytes= 153426-1=153425
Total time= 0.192625-0.024047= 0.168578
Throughput= 153425/0.168578 = 910,112.83 bytes/s

12. 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. Consider the “fleets” of packets sent around t = 0.025, t = 0.053, t = 0.082 and t = 0.1. Comment on whether this looks as if TCP is in its slow start phase, congestion avoidance phase or some other phase. Figure 6 shows a slightly different view of this data.

Ans: Slow start phase

13. These “fleets” of segments appear to have some periodicity. What can you say about the period?

Ans: The sequence number vs. time graph shows that the client sends data in fleets separated by short pauses. The period between successive fleets is approximately 20–25 ms, which corresponds to the RTT of the connection