

## **EXERCISE 1**

### **Question 1:**

IP address: 128.119.245.12 port number: 80

Client computer ip: 192.168.1.102 port number: 1161

### **Question 2:**

As the destination port of the 4<sup>th</sup> segment is (80)http and has HTTP POST in the command

Sequence number: 1

### **Question 3:**

$(eRTT = (1-a) * eRTT + a * SampleRTT)$

six segments in the TCP connection (including the segment containing the HTTP POST) : 4 5 7 8 10 11

web server (Do not consider the ACKs received from the server as part of these six segments): 6 9 12 14 15 16

sequence number(4) : 1 / sent time(0.026477) / ACK received(0.053937) / RTT (0.053937-0.026477 = 0.02746) / eRTT(0.02746)

sequence number(5) : 566 / sent time(0.041737) / ACK received(0.077294) / RTT (0.035557) / eRTT(0.0285)

sequence number(7) : 2026 / sent time(0.054026) / ACK received(0.124085) / RTT (0.070059) / eRTT(0.0337)

sequence number(8) : 3486 / sent time(0.054690) / ACK received(0.169118) / RTT (0.11443) / eRTT(0.0438)

sequence number(10) : 4946 / sent time(0.077405) / ACK received(0.2172799) / RTT (0.13989) / eRTT(0.0558)

sequence number(11) : 6406 / sent time(0.078157) / ACK received(0.267802) / RTT (0.18964) / eRTT(0.0725)

### **Question 4:**

(4) TCP Segment Len: 565

All other ones : TCP Segment Len: 1460

### **Question 5:**

Window size value: 5840

Max win=62780

### **Question 6:**

No retransmitted segments in the trace file.

Check the sequence numbers of tcp segments in trace file can help us to answer the question

### **Question 7:**

Acknowledgment number: 566 / Acknowledgment data 566

Acknowledgment number: 2026 / Acknowledgment data 1460

Acknowledgment number: 3486 / Acknowledgment data 1460

Acknowledgment number: 4946 / Acknowledgment data 1460

Acknowledgment number: 7866 / Acknowledgment data 1460

Acknowledgment number: 9013 / Acknowledgment data 1147

Acknowledgment number: 10473 / Acknowledgment data 1460

...

#### Question 8:

1 byte for the 4<sup>th</sup> segment / 164091 bytes for the 202<sup>nd</sup> segment

Total data = 164091-1=164090 bytes

0.026477s for the 4<sup>th</sup> segment / 5.455830s for the 202<sup>nd</sup> segment

Total trans time = 5.455830 – 0.26477 = 5.4294s

Total amount of data/total transmission time = 164090/5.4294=30222byte/sec

## **EXERCISE 2**

Question1:

Seq=2818463618

Question2:

Seq = 1247095790 Ack = 2818463619 = (2818463618 + 1)

Question3:

Seq = 2818463619 Ack = 1247095791

It doesn't contains any data

Question4:

Client has done the active close, because client sent FIN flag to tell the server to end

4 segment (FIN/ACK/FIN/ACK)

Question5:

ACK= Seq+data length