Lab 4

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Exercise 1

Question1:

Address of gaia.cs.umass.edu: 128.119.245.12

port num: 80

IP address of source: 192.168.1.102 port num of source: 1161

Question2:

232129013

Question3:

Starting from 4th segment, then the first six sequence numbers are (exclude ACKs received from the server):

232129013

232129578

232131038

232132498

232133958

232135418

At what time each segment sent

0.026477

0.041737

0.054026

0.054690

0.077045

0.078157

When was the ACK for each segment received

0.053937

0.053937

0.077294

0.124085

0.169118

0.217299

RTT value for each segment:

0.02746

0.01220

0.023268

0.069395

0.091713

0.139142

Question 4:

565 bytes

1460 bytes

1460 bytes

1460 bytes

1460 bytes

1460 bytes

Question 5:

Minimum available buff space is 5840 bytes, it won't throttle the sender because the window size is gradually to 62780 bytes, and the length of contents is smaller than the size.

Question 6:

There is no retransmitted segments in the trace file by using tcp.analysis.retransmission in filter

Question 7:

The receiver typically acknowledges 1460 bytes in an ACK

55	1.119029	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=232165521 Ack=883061786 Win=17520 Len=1460
56	1.119858	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=232166981 Ack=883061786 Win=17520 Len=1460
57	1.120902	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=232168441 Ack=883061786 Win=17520 Len=1460
59	1.200421	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=883061786 Ack=232164061 Win=62780 Len=0
60	1.265026	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=883061786 Ack=232166981 Win=62780 Len=0
61	1.362074	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=883061786 Ack=232169901 Win=62780 Len=0
62	1.389886	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=883061786 Ack=232170793 Win=62780 Len=0

There is no Acknowledgement for seq=232168441 and 232165521

Question 8:

The total amount data transmitted can be calculated by using relative sequence number. The sequence number of the last segment is 164091, hence the total amount data transmitted is 164091.

Transmission time is t = 5.455830 – 0.026477 = 5.4294 (5.455830 is the time when the last segment is received before received HTTP/1.1 OK request successfully)

Hence the throughput = 164091 / 5.4294 = 30223 bps

Exercise 2

Question 1:

2818463618

Question 2:

Sequence number of SYNACK: 1247095790

ACK in SYNACK: 2818463619

The size of package plus SYN sequence number (2818463618)

Question 3:

Sequence number of ACK to reply SYNACK: 2818463619

Acknowledgement field in ACK: 1247095791

This segment doesn't contain any data, as the two Seqs are same

Question 4:

Both client and the server have done the active close. Simultaneous close, because there are two [FIN, ACK] messages (one for server, one for client), and they are sent out simultaneously.

Question 5:

Date transmitted from client to server: 2818463652 – 2818463619 = 33

Data transmitted: 1247095831 – 1247095791 = 40

There are 2 bytes difference for them because ISN and ACK each consumes 1 byte