Exercise 1

1. The IP address of gaia.cs.umass.edu is 128.119.245.12

port number used for this connection is 80



the IP address and TCP port number used by the client computer (source) that is transferring the file to gaia.cs.umass.edu is 192.168.1.102 and 1161





2. the sequence number is 232129013

3.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Sequence | Length (bytes) | Time sent | Time received | Sample RTT | Estimated RTT |
| 1 | 232129013 | 565 | 0.02648 | 0.05394 | 0.02746 | 0.02746 |
| 2 | 232129578 | 1460 | 0.04173 | 0.0773 | 0.03556 | 0.02847 |
| 3 | 232131038 | 1460 | 0.05403 | 0.12409 | 0.07006 | 0.03367 |
| 4 | 232132498 | 1460 | 0.05469 | 0.16912 | 0.11443 | 0.04377 |
| 5 | 232133958 | 1460 | 0.07741 | 0.2173 | 0.13989 | 0.05578 |
| 6 | 232135418 | 1460 | 0.07816 | 0.2678 | 0.18966 | 0.07251 |
| All | Estimate | To | 10^-5 |  |  |  |

↑

4 above

5. The minimum advertised window is 5840，lack of receiver buffer space does not seem to be an issue with this connection since we find when the congestion window has grown to a reasonable size, the receiver advertised window is very large.

6.

I think there are not any retransmitted segments in the trace file

because I tried to find a repeat entry for that segment which is retransmitted with the same sequence number but I failed

7. In general, receiver will typically ack each pack individually(Just like in the beginning).But at segment #60, we find ack is acknowledging two segments, that is because Tcp used Delayed Ack where the receiver waits a moment and sends a cumulative ack for all the received segment in that moment(Based on the lecture notes and Section 3.5 of the text)

8.

Throughput = total data/total time

The total amount data transmitted can be computed by the difference between the sequence number of the first TCP segment and the acknowledged sequence number of the last ACK

Which is Total data = 164091 - 1 = 164090

Total time = 5.455830 - 0.026477 = 5.4294

So throughput is 164090/5.4294 = 30.222 KByte/sec.

Exercise 2

1. 
2. 

That ack is the private seq +1

1. 

There is no data included in this last segment

4.they both close the active since #305,#304, we find seq and ack didn’t add 1 which means they're all closed and type should be Simultaneous

5.client: 2818463653 - 2818463618 – 2 = 33 bytes which is the difference between final ack and first ack (2 [represent](javascript:;) Fin and Syn)

server: 1247095832 - 1247095790 - 2 = 40 Bytes which is the difference between final seq and second seq