Lab 3 - TCP

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02/06/2016

1. IP address: 192.168.1.102

Port: health-polling 1161

2. IP address: 128.119.245.12

Port: 80

3. Was not able to set up my own trace on WIFI.



4. Sequence number: 0 (relative sequence number)

5. Sequence number: 0 (relative sequence number)

Acknowledgement: 1 (relative ack number)

The server at Umass determined the ack number of 1 because it was responding to the source with a syn and attached the ack packet.

The flags set within the TCP packet denoted this packet as both a syn packet and an ack packet.



6. The packet that contains the POST request was sequence number 1.



7.

1. Sequence number: 1

Sent Time: Aug 21, 2004 06:44:20.596858000

Ack Time: Aug 21, 2004 06:44:20.624318000

RTT: 27460000

ERTT: 27460000

1. Sequence number: 566

Sent Time: Aug 21, 2004 06:44:20.612118000

Ack Time: Aug 21, 2004 06:44:20.647675000

RTT: 35557000

ERTT: .875 \* 27460000 + .125 \* 35557000 = 28472125

1. Sequence number: 2026

Sent Time: Aug 21, 2004 06:44:20.624407000

Ack Time: Aug 21, 2004 06:44:20.694466000

RTT: 70059000

ERTT: .875 \* 28472125 + .125 \* 70059000 = 33670484

1. Sequence number: 3486

Sent Time: Aug 21, 2004 06:44:20.625071000

Ack Time: Aug 21, 2004 06:44:20.739499000

RTT: 114428000

ERTT: .875 \* 33670484 + .125 \* 114428000 = 43765174

1. Sequence number: 4946

Sent Time: Aug 21, 2004 06:44:20.647786000

Ack Time: Aug 21, 2004 06:44:20.787680000

RTT: 139894000

ERTT: .875 \* 43765174 + .125 \* 139894000 = 55781277

1. Sequence number: 6406

Sent Time: Aug 21, 2004 06:44:20.648538000

Ack Time: Aug 21, 2004 06:44:20.838183000

RTT: 189645000

ERTT: .875 \* 55781277 + .125 \* 189645000 = 72514242

8.

1. Length: 619
2. Length: 1514
3. Length: 1514
4. Length: 1514
5. Length: 1514
6. Length: 1514

9. The minimum available buffer space advertised by the server was in the SYN ACK packet during the beginning of the TCP connection. The minimum buffer space was 5840. From the TCP trace it never looked like the sender was throttled even when the window size reached its maximum of 62780.



10.



As you can see from the Time/Sequence graph there were no retransmissions, if there had been the line would not be linear like that.

11. From the trace it looks like the server is ACKing every two packets.



As you can see between the pairs of packets there is one ACK message from the server.

12. To calculate throughput we will need to know the size of the whole payload and the total time it took for the payload to go from the source to the destination. Then the equation is:

Total time was taken from the last ACK packet and subtracted the first non-handshake packet.

Total bytes was listed at the top of the instructions for this lab.

13. The slow start is pretty easy to see on the Stevens graph as it shows the communication between the source and the destination sending one packet at a time followed by one ACK.

After the handshake you can see that the source begins sending many packets at once. The pattern suggests that this connection was in congestion avoidance scheme but from the packets being sent there should never really be any congestion. This could be a modification to the way the source or destination have been configured.

14. I was not able to setup wireshark on my laptop since it only has WIFI. I am assuming that the packet graph would look less chunky and the throughput would be better because of that.