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CMPSCI 381 Lab 6

Honor Code: *This work is my own unless otherwise cited.*

Part 2:

A) The next 8 packets after the Three-way handshake for the Eth connection:

8326	0.000188000	141.195.226.142	54927	129.132.19.216	https	TLSv1.2255	Client Hello
8390	0.133485000	129.132.19.216	https	141.195.226.142	54927	TCP 60	https > 54927 [ACK] Seq=1 Ack=202 Win=32567 Len=0
8391	0.000206000	129.132.19.216	https	141.195.226.142	54927	TCP 1434	[TCP segment of a reassembled PDU]
8392	0.000045000	141.195.226.142	54927	129.132.19.216	https	TCP 54	54927 > https [ACK] Seq=202 Ack=1381 Win=31740 Len=0
8393	0.000104000	129.132.19.216	https	141.195.226.142	54927	TCP 1434	[TCP segment of a reassembled PDU]
8394	0.000026000	141.195.226.142	54927	129.132.19.216	https	TCP 54	54927 > https [ACK] Seq=202 Ack=2761 Win=34500 Len=0
8395	0.000092000	129.132.19.216	https	141.195.226.142	54927	TLSv1.21761	Server Hello, Certificate, Server Hello Done
8396	0.000046000	141.195.226.142	54927	129.132.19.216	https	TCP 54	54927 > https [ACK] Seq=202 Ack=4468 Win=37260 Len=0

Packet 8326: local host to foreign host seq: 1 ack: 1 len: 201
Packet 8390: foreign host to local host seq: 1 ack: 202 len: 0
Packet 8391: foreign host to local host seq: 1 ack: 202 len: 1380
Packet 8392: local host to foreign host seq: 202 ack: 1381 len: 0
Packet 8393: foreign host to local host seq: 1381 ack: 202 len: 1380
Packet 8394: local host to foreign host seq: 202 ack: 2761 len: 0
Packet 8395: foreign host to local host seq: 2761 ack: 202 len: 1707
Packet 8396: local host to foreign host seq: 202 ack: 4468 len: 0

The seq, ack, and len values for the packets described above are related in the following ways. The first packet that the local host sends to the foreign host has a seq value of 1, and a len value of 201. Thus the next packet that is sent from the local host (packet 8392) will have a seq value of $1 + 201 = 202$, which it does. This can also be seen in messages sent from the foreign host, for example, packet 8391 has a seq value of 1 and a len value of 1380, so the next packet sent out from the foreign host (packet 8393) has a seq value of 1381. Now, packet 8326 is sent from the local host to the foreign host with an ack

value of 1. Packet 8392 is the next packet sent from the local host, and this has an ack value of 1381. This is because the previous packet sent from the foreign host to the local host (packet 8391) had a len value of 1380. Thus packet 8392's ack value is $1 + 1380 = 1381$, where 1 is the ack value of the previous packet sent out from that host, and 1380 is the last amount of bytes that the host received.

B) The Three-way handshakes for each website:

Stanford.edu

Packet 516, seq: 0, source host: 141.195.226.142, destination host: 52.11.42.24

Packet 634, seq: 0, source host: 52.11.42.24, destination host: 141.195.226.142

Packet 635, seq: 1, source host: 141.195.226.142, destination host: 52.11.42.24

iRTT: 0.089999000 seconds

Tsinghua.edu.cn

Packet 2319, seq: 0, source host: 141.195.226.142, destination host: 166.111.4.100

Packet 2439, seq: 0, source host: 166.111.4.100, destination host: 141.195.226.142

Packet 2440, seq: 1, source host: 141.195.226.142, destination host: 166.111.4.100

iRTT: 0.254245000 seconds

Ethz.ch

Packet 8207, seq: 0, source host: 141.195.226.142, destination host: 129.132.19.216

Packet 8324, seq: 0, source host: 129.132.19.216, destination host: 141.195.226.142

Packet 8325, seq: 1, source host: 141.195.226.142, destination host: 129.132.19.216

iRTT: 0.136408000 seconds

Stanford.edu had the shortest iRTT, and Tsinghua.edu.cn had the longest iRTT. I attribute this to the locations of each website, seeing how Tsinghua's servers are the farthest away from our local machines, and Stanford's servers are the closest to our local machines.

