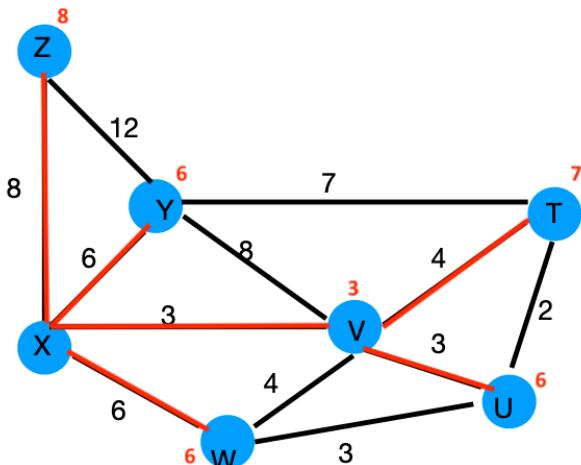


CS331 Project 4 Problems – Ben Webb

1. The developer would choose to use UDP over TCP when they are more interested in communicating as many packets as possible as opposed to all packets. A common example is video and audio streaming services, they need to communicate as much information as possible, but if one of the packets gets lost and a frame is dropped, that is overall better than ensuring all frames reach the user.
2. During the three-way handshake, each would share their buffer sizes. TCP messages will then be sent incrementally larger until the transmission window reaches 50 Mb. At that point the Congestion Window will be larger than the Receiver Window and the transmission window will cease to grow. Because there is a direct connection between the two and the link will never reach its bottleneck.
3. It would take 3425 full datagrams to send the full file. I found this by dividing 5,000,000 by the maximum number of bytes that could be in one datagram (1500-20-20=1460).



4.

{X,V,U, W, Y, T, Z}

5. Gloin: IPv4=137.146.183.16 & IPv6=fe80::da9e:f3ff:fe40. Dori: IPv4=137.146.183.12, IPv6=fe80::da9e:f3ff:fe41:f985

```

7 packets transmitted, 7 received, 0% packet loss, time 6150ms
rtt min/avg/max/mdev = 0.200/0.214/0.243/0.017 ms
--- gloin.cs.colby.edu ping statistics ---
37 packets transmitted, 37 received, 0% packet loss, time 36866ms
rtt min/avg/max/mdev = 0.130/0.213/0.242/0.020 ms
--- dori.cs.colby.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9222ms
rtt min/avg/max/mdev = 0.137/0.205/0.227/0.030 ms

```

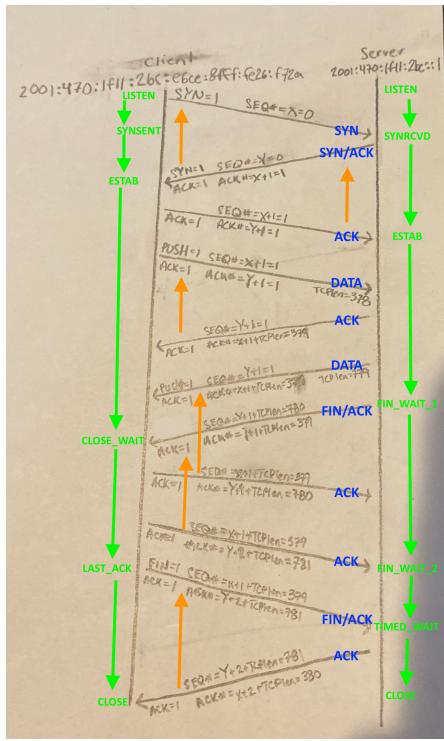
I pinged gloin and dori at multiple times throughout the day. As you can see there is not really a significant change in the RTT depending on the time of day. I assume that is because they are one hop away from each other. I confirmed this using the traceroute command.

```

bmwebb20@dori:~$ traceroute gloin.cs.colby.edu
traceroute to gloin.cs.colby.edu (137.146.183.16), 30 hops max, 60 byte packets
 1  gloin.cs.colby.edu (137.146.183.16)  0.166 ms  0.143 ms  0.126 ms

```

6.



- Client: 0x892bf4c; Server: 0x5402f9d8
- Done in blue.**
- Done in orange.**
- Done in green.**
- The three packets I chose were 1/2, 4/5, and 10/11. 2 is a response to 1 from the server with a RTT of 3.85 ms. 5 is a response to 4 with a RTT of 0.76 ms. 11 is a response to 10 with a RTT of 0.78 ms. I think the latency of the network is around 0.78 seconds. The first packet took a longer time to receive because it also involved exiting the LISTEN state for the server.