

Robert Ignatowicz
CSE 310 Programming Assignment 2

To get the TCP flows in Part A, I used a dictionary of lists which allowed me to find related packets based on the sender's port number. Originally I started off with just a dictionary of TCP objects but I realized it wouldn't be suitable if the capture file contained several flows with the same port combination. Once I had the TCP Flows mapped out, I calculated the throughput by summing up the bytes sent out starting from the initial SYN packet along with headers, and divided it by the total time taken since the first SYN was sent to the final ACK in milliseconds.

I calculated the relative sequence numbers by subtracting the raw sequence number from the original sequence numbers at the beginning of the handshake. To calculate the RWND, I obtained the window scaling factor from the initial SYN sent out by the sender, and left-shifted the window size in each packet by that scaling factor.

In Part B, I calculated the estimated RTT by using a weighted average of previous RTTs. I used the RTT from the first SYN as my initial RTT and applied a weight of 0.125 on the new RTTs. Whenever I found an packet acknowledgement from the receiver I checked if the time since the original packet was roughly one RTT, and if it was, I calculated the CWND by setting it equal to the packets sent since the last RTT. I then subtracted the packets that were acknowledged to update the buffer for the next RTT.

In order to check if a packet timed out, upon retransmission of a packet, I checked to see if the time since the original transmission was greater than the estimated RTT. To check for triple duplicate acks, I counted ACKs with duplicate ack numbers in a dictionary, and if the number equalled 3, I counted the next retransmission of that seq number as a triple duplicate ACK rather than a timeout.