CN-3530/CS 301 Assignment 2

1. Stop and Wait Protocol

Question 1 – Number of retransmissions and throughput with different retransmission timeout values with stop-and-wait protocol. For each value of retransmission timeout, run the experiments for **5 times** and write down the average **number of retransmissions** and **average throughput**.

Retransmission timeout (ms)	Average number of re-transmissions	Average throughput (Kilobytes per second)
5	1724	72.077935
10	1005	70.349727
15	155	67.936760
20	143	65.376488
25	142	58.684450
30	136	57.060436
40	138	47.895723
50	142	44.826233
75	135	39.288175
100	144	35.257552

Question 2 – Discuss the impact of retransmission timeout value on number of retransmissions and throughput. Indicate the optimal timeout value from communication efficiency viewpoint (i.e., the timeout that minimizes the number of retransmissions and keeps the throughput as high as possible).

We can observe that in the case of 5ms and 10ms they are less than RTT so the average retransmission number is very high compared to later timeouts. As we increase the retransmission timeout average throughput for every packet delay or acknowledgement delay we wait until timeout occurs so the sender sits idle the entire timeout time since we have a delay of 5% in each case as timeout increases waiting time of sender increase therefore, throughput decreases.

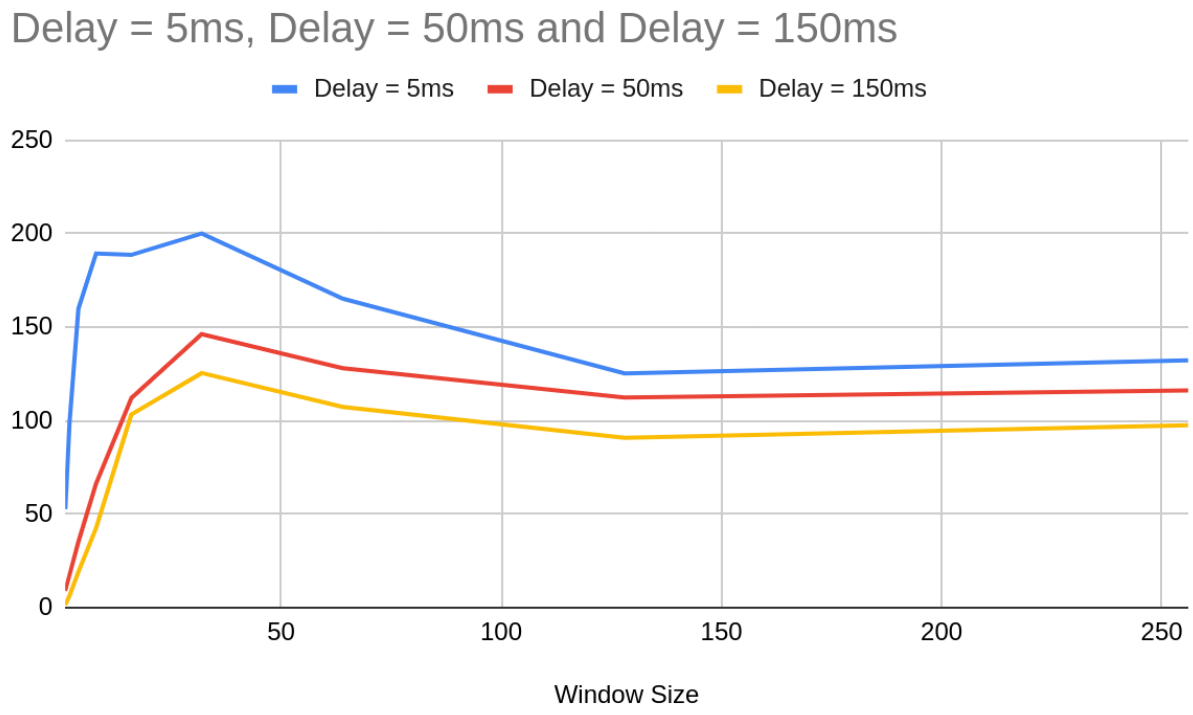
optimal value timeout in this case is: 30ms

2. Go back N Protocol

Question 1 – Experimentation with Go-Back-N. For each value of window size, run the experiments **5 times** and write down the **average throughput**.

	Average throughput (Kilobytes per second)		
Window Size	**Delay = 5ms**	**Delay = 50ms**	**Delay = 150ms**
1	52.643365	8.949137	1.354244
2	98.818111	17.720955	6.551466
4	159.898782	35.2141714	19.32544
8	189.388781	66.338766	42.524552
16	188.658926	112.16466	103.25225
32	200.1093420	146.252373	125.45434
64	165.303941	128.026455	107.35245
128	125.333190	112.390038	90.814244
256	132.257043	116.128781	97.485429

Create a graph similar to the one shown below using the results from the above table: (Edit: change delays to 5ms, 50ms and 150 ms as mentioned in the assignment statement)



Question 2 – Discuss your results from Question 1.

We can observe that as the delay increases the throughput decreases because the sender waits a long time for a high delay for the same 5% packet loss. The graph of throughput first increased as window size increased and then almost remained the same for the increase in window size. As the window increases we can send large amounts of data at the same time instead of waiting idle. Once the size of the window crosses an optimal value the throughput remains the same for the same bandwidth.

PLAGIARISM STATEMENT <Include it in your report>

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