

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	229	304
10	123	284
15	129	225
20	122	185
25	123	171
30	124	143
40	120	121
50	124	99
75	111	87
100	123	68

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).

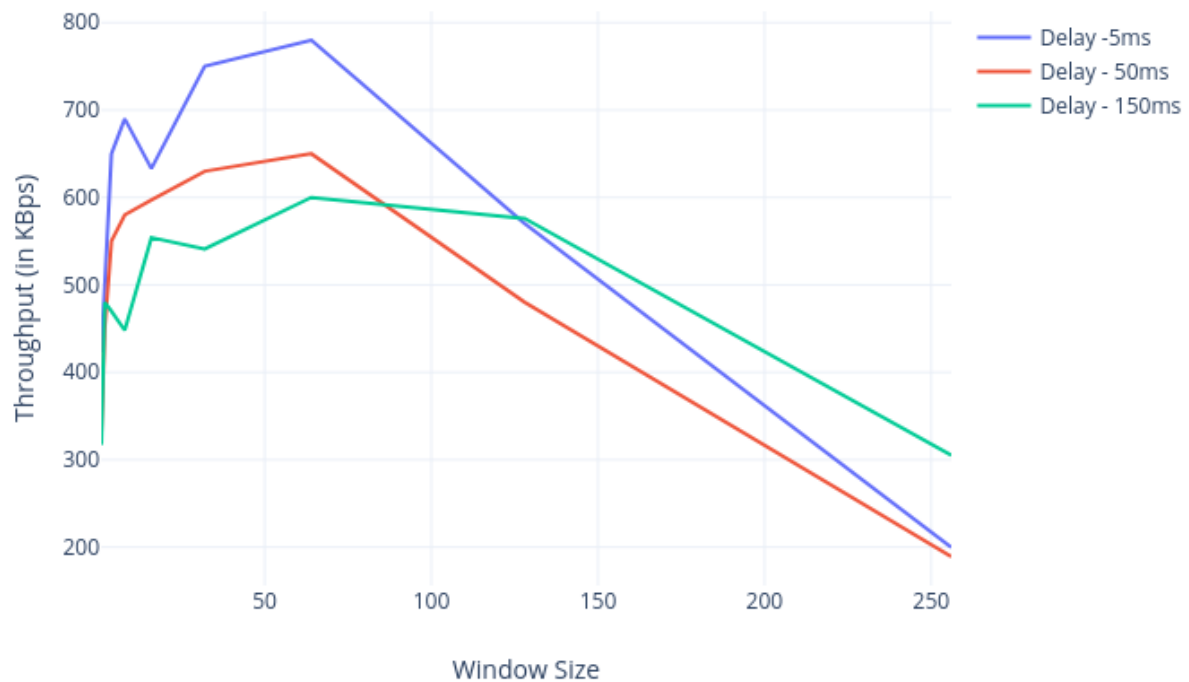
The above table depicts a clear relation between throughput and timeout value. As timeout increases the throughput decreases. This is as the timeout increases the packet has to wait longer to recover, thus resulting in decreased throughput. However, the retransmissions are high for 5ms timeout but almost similar (10%) in the rest of the cases. When the timeout is very low the no. of retransmissions increase but once the packets get enough time to come back the no. of retransmissions become similar. Thus the **best retransmission timeout value would be 10 ms**.

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	423	330	317
2	502	450	480
4	650	550	470
8	690	580	448
16	633	597	554
32	750	630	541
64	780	650	600
128	570	480	576
256	200	189	305

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.

The above plot shows that as window size increases, the throughput increases up to a certain window size and then decreases abruptly. This is because as window size increases more and more packets can be sent together resulting in overall rise of throughput. However, as the window size increases, in case of a timeout the sender has to send the entire window again resulting in multiple retransmissions leading to a decreased throughput.

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