24.12.2019

BILKENT UNIVERSITY

CS 421 – Computer Networks

Programming Assignment #2 REPORT

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In this report, the test results of execution of sender and receiver code will be discussed. As we covered in the course, the throughput depends on packet loss rate and window size. Intuitively, as the packet loss rate increases, the time it takes to send the packet successfully should increase because as packets are getting lost, the window will shift less frequently. In the other case, as the window size increases, the throughput should increase because more segments are sent in parallel. In this report, two of these experiment results will be shown with plots and we will state whether our assumptions are true.

Throughput is in bits per second, and it is calculated by dividing the total byte size of the transferred file to the time elapsed:

Throughput (bps) = File Size (bit) / Transfer Time (second)

The table below shows our measurements in the experiment of varying loss rates.

Table 1 – Results of Experiment of Throughput Versus Loss Rate

Time elapsed (second)	Throughput (bps)	Loss rate (p)	Dmax (ms)	Timeout (ms)	N
40.77	1919573.31	0	100	120	20
75.31	1039210.2	0.1	100	120	20
100.53	778503.13	0.2	100	120	20
134.25	582964.02	0.3	100	120	20
175.98	444726.22	0.4	100	120	20
237.27	329847.52	0.5	100	120	20

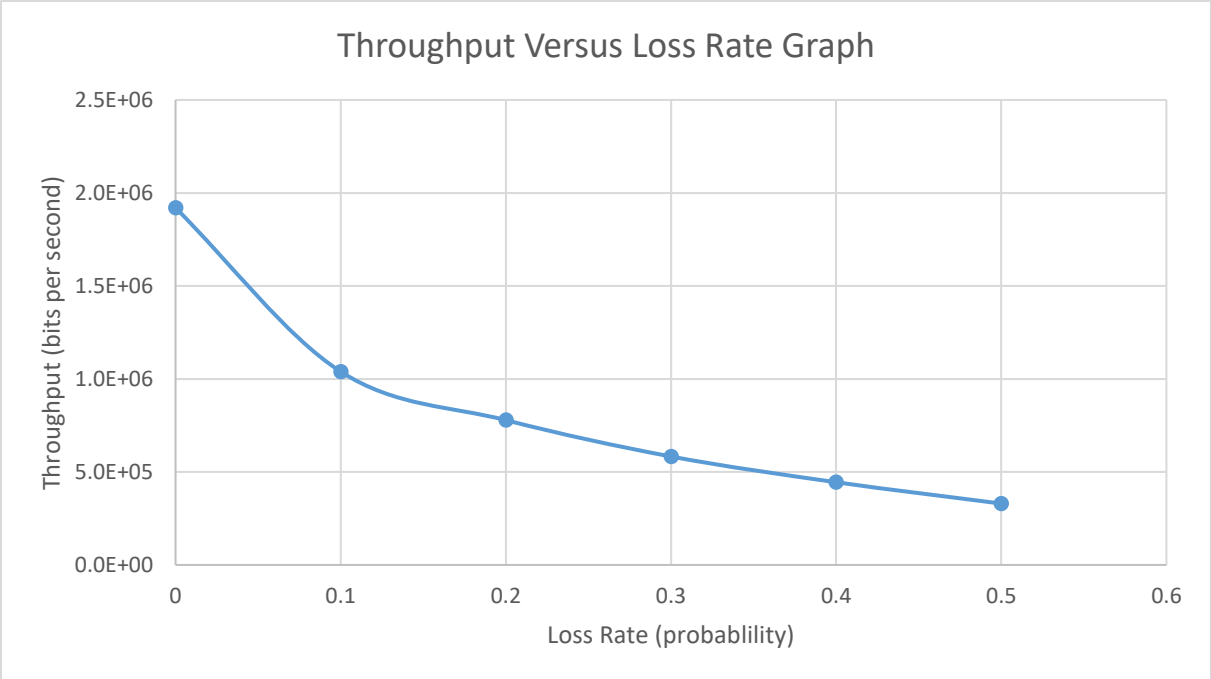

Figure 1 – Throughput Versus Loss Rate Graph

The graph above depicts the throughput versus loss rate. As we can see, as the probability of packet loss increases, throughput in terms of bits per second decreases. Hence, our intuitive assumption and the information we learned in the course is proven to be correct.

Time elapsed (second)	Throughput (bps)	Loss Rate (p)	Dmax (ms)	Timeout (ms)	N
74.85	1045596.79	0.1	100	120	20
44.12	1773864.91	0.1	100	120	40
32.41	2414776.92	0.1	100	120	60
25.93	3018238.33	0.1	100	120	80
22.47	3482995.99	0.1	100	120	100

The table below shows our measurements in the experiment of varying loss rates.

Table 2 – Results of Experiment of Throughput Versus Window Size

The graph below depicts the throughput versus window size. As we can see, as the window size increases, throughput in terms of bits per second increases. Therefore, our assumptions are proven to be correct. That is, as window size gets larger the throughput increases.

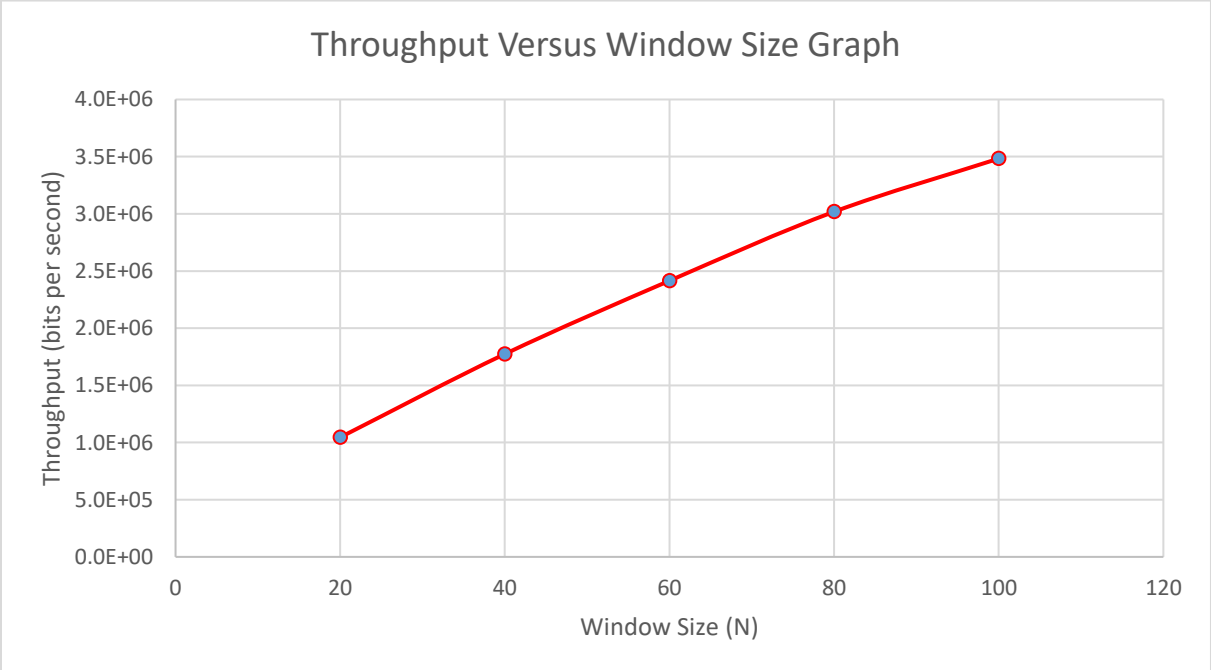

Figure 2 – Throughput Versus Window Size Graph