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CSE 589

PA2 Report

I have read and understood the course academic integrity policy.

Timeout

Alternating Bit (ABT)

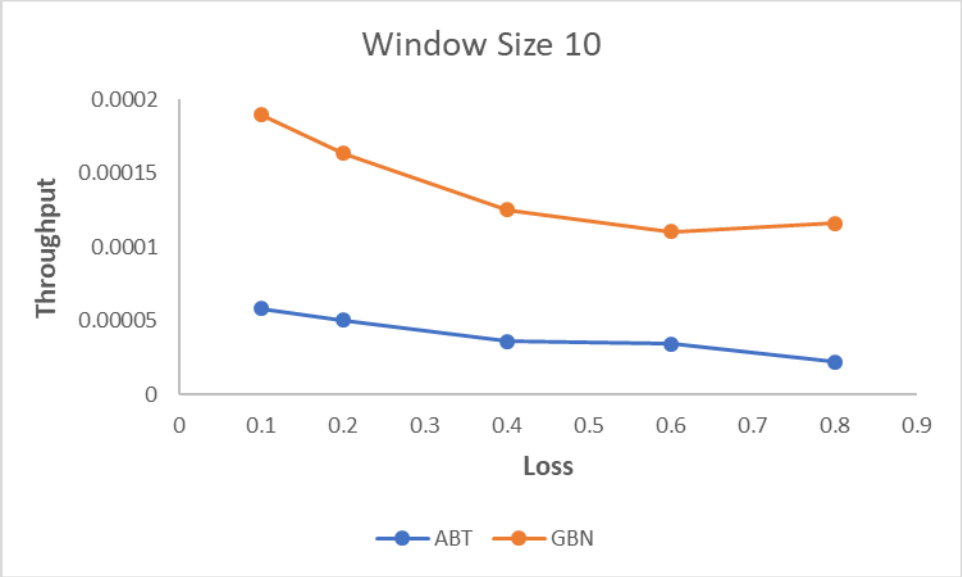
The timeout time for ABT was determined under the assumption that a packet sent into the network takes an average of 5 time units to arrive at the other side when there are no other messages in the medium. Assuming a roundtrip time of 10 time units, the timeout is determined at minimum to be double that value, which in this case makes the timeout value a minimum of 20 time units. I chose 23 as the value of the timeout. The efficiency wasn't considered in this choice.

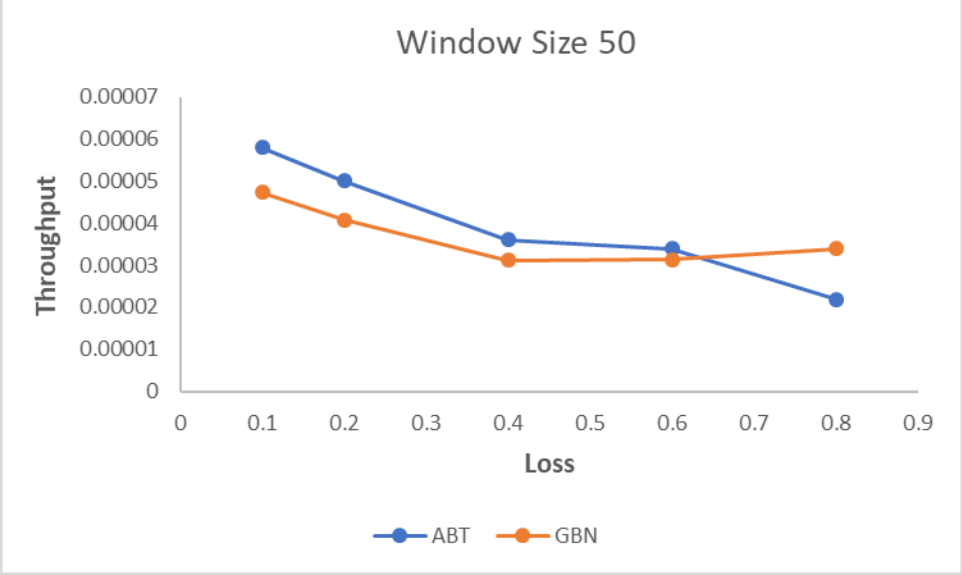
Go-Back-N (GBN)

The timeout for GBN was double that of the alternating bit protocol . A small timeout would result in extra waiting time for packets that need to be retransmitted. Timeout chosen is 40 (double the minimum in ABT solution shown above).

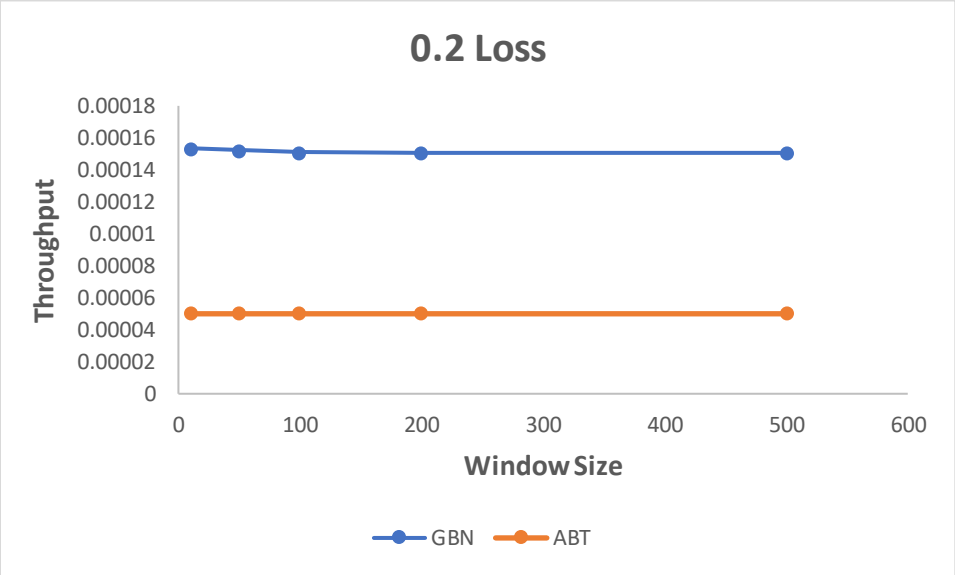
Analysis

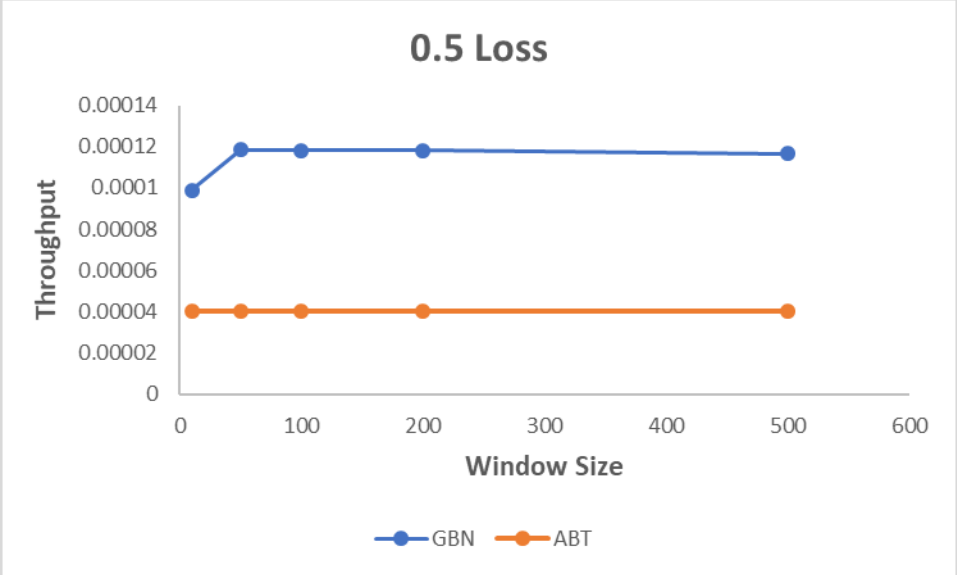
Shown below are the comparisons of ABT and GBN for Experiment 1 where the throughput is compared across different loss probabilities. The throughput for GBN is , as expected, higher than the ABT for any loss probability due to the fact of cumulative acknowledgments and sending multiple packets within a window for GBN. As expected for both protocols, the throughput decreases as the loss probability increases. Therefore the results match the expected theoretical results. As the window size increased by five times in the GBN protocol, the throughput became even worse than ABT. The reason is that a larger window means more packages will be retransmitted whenever a loss occurs whereas in ABT the retransmission is very quick and occurs with only 1 packet at a time.

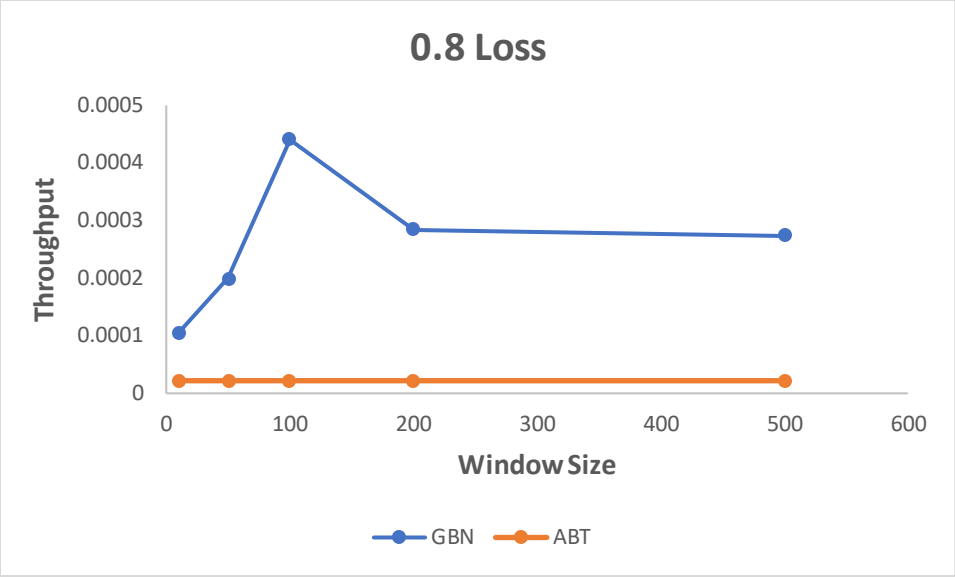




In the figures below, the throughput with different window sizes at various loss probabilities for ABT and GBN are examined. At 0.2 loss, the throughputs were consistent for both ABT and GBN throughout the different window sizes. The throughput in general didn't change for ABT across all window sizes (trivially) while it decreased as the loss probability increased in the GBN case. At 0.5 loss probability, the GBN protocol throughput decreased. In the 0.8 loss probability case, the GBN protocol increases its throughput at a higher window size but then as the window gets too big, the throughput decreases. The timeouts can be optimized depending on the circumstances of the network available to the user and the loss and corruption probabilities.






0.8 Loss
Throughput
0.0005
0.0004
0.0003
0.0002
0.0001
0
0
100
200
300
400
500
600
Window Size
GBN
ABT