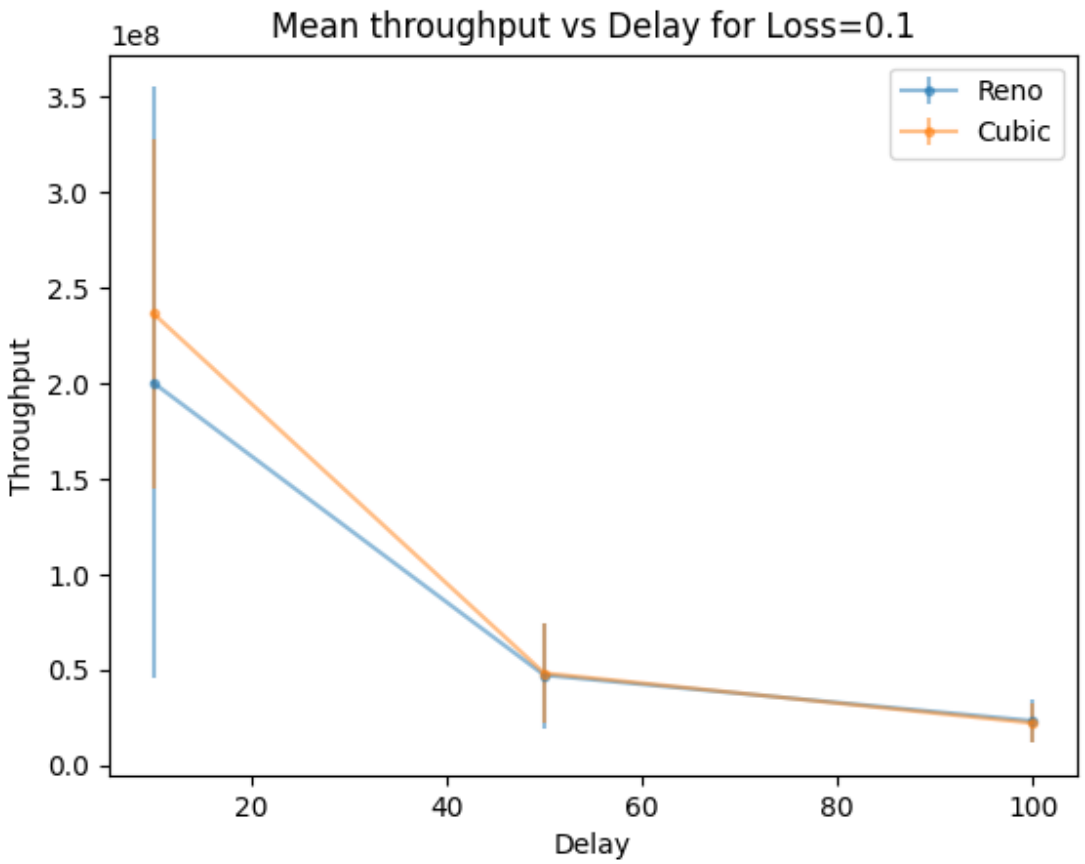
CS252 : Lab-6 Report

190050059, 190050118, 190050121

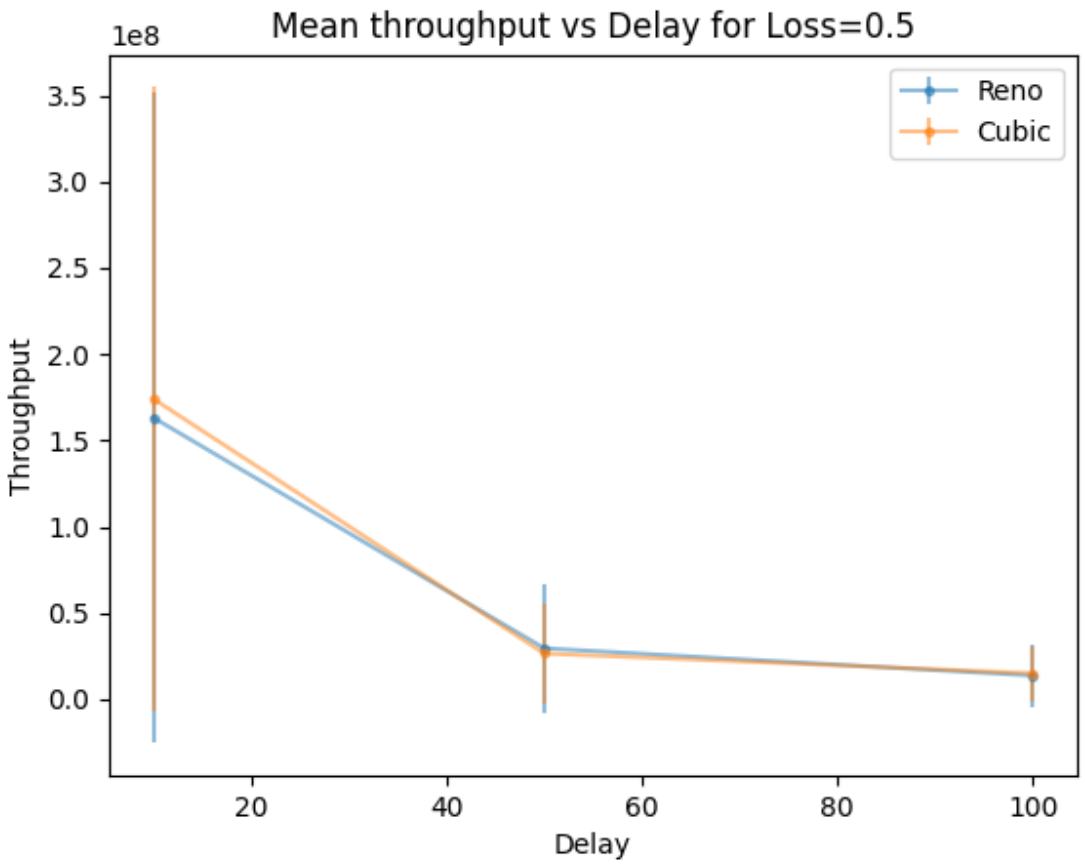
Plot-1: Throughput vs Delay for Loss=0.1%



Mean throughput was considerably higher for TCP cubic than TCP reno at a lower delay(10ms). The length of confidence intervals are seen to be decreasing as the value of delay increases. Reno and Cubic appear

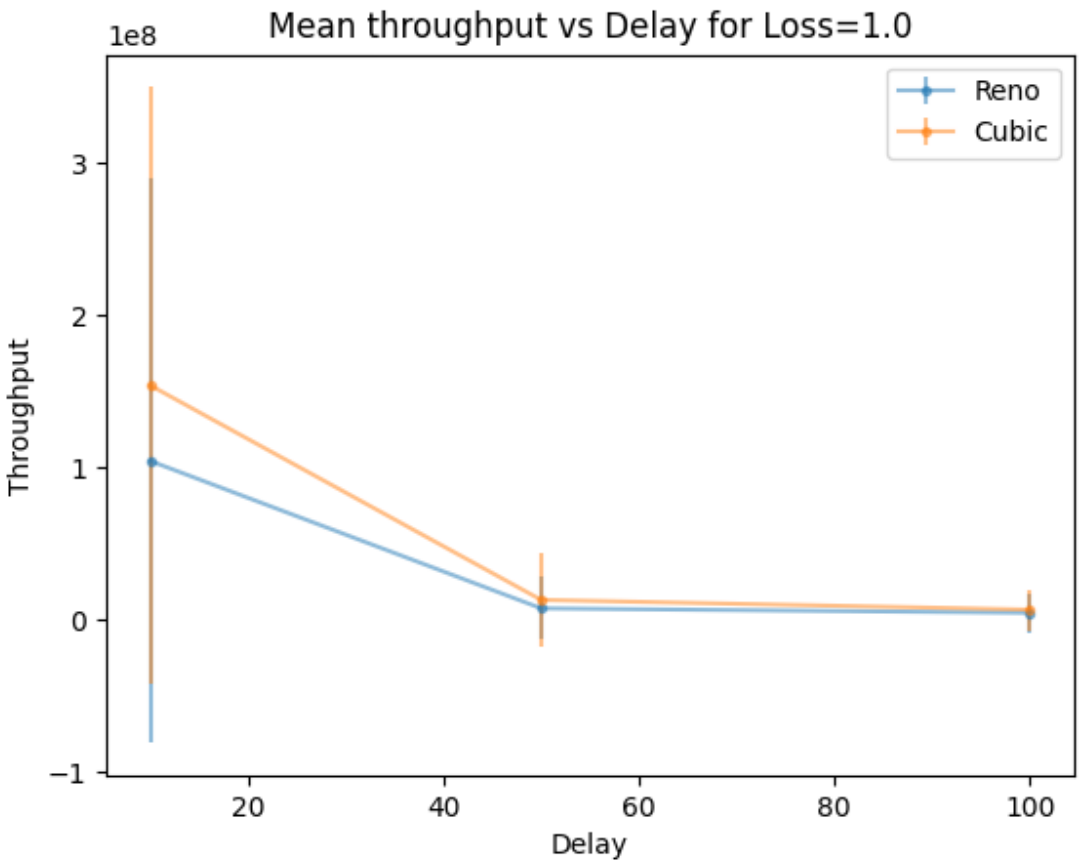
to be giving very similar results at higher delays of 50ms and 100ms. Throughput is obviously seen to be decreasing for both, as delay increases.

Plot-2: Throughput vs Delay for Loss=0.5%



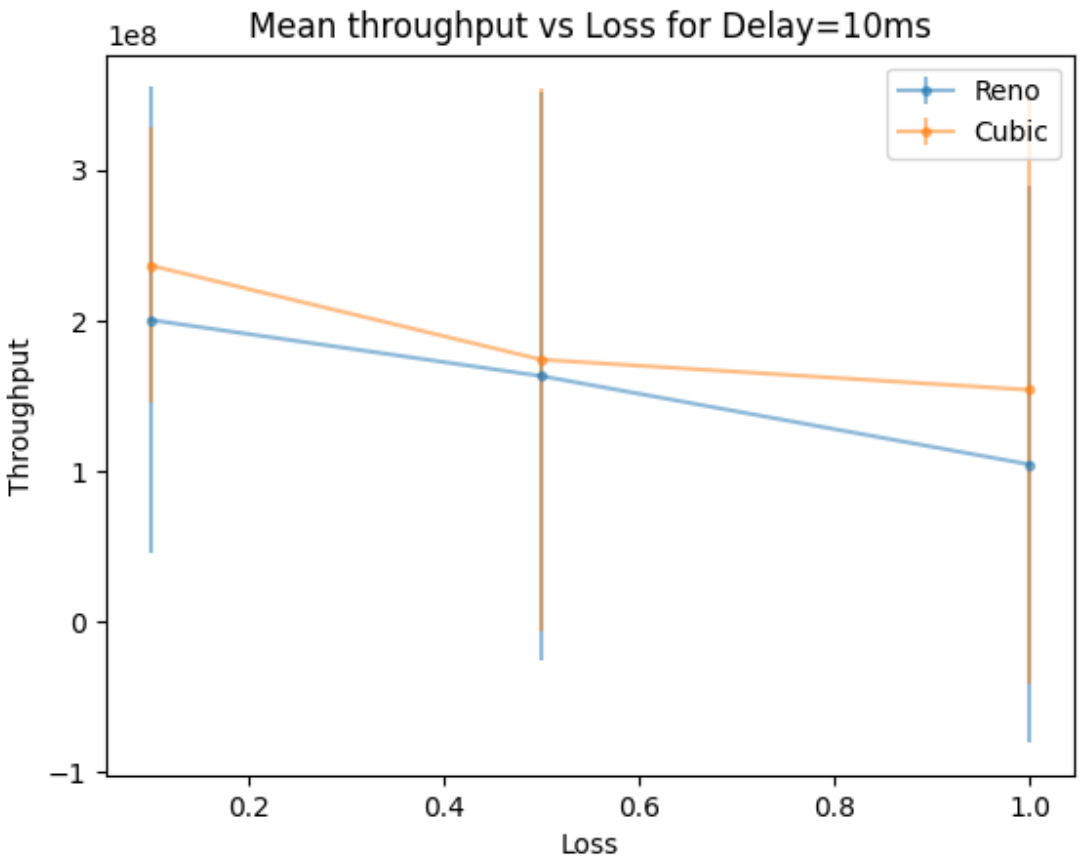
Mean throughput appears to be very slightly higher for cubic than reno at lower delay(10ms). The length of confidence intervals are seen to be decreasing as the value of delay increases. Reno and Cubic appear to be giving very similar results at higher delays of 50ms and 100ms. Throughput is obviously seen to be decreasing for both, as delay increases.

Plot-3: Throughput vs Delay for Loss=1%



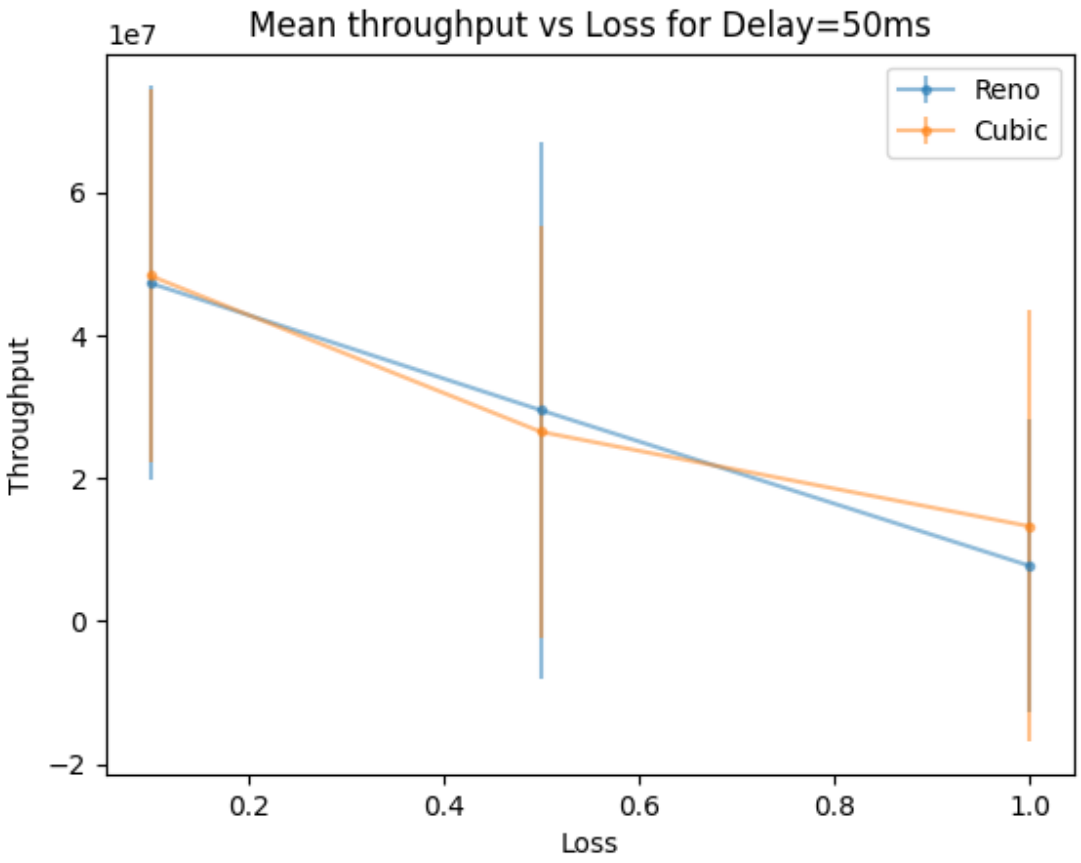
Mean throughput appears to be very slightly higher for cubic than reno at 50ms and significantly higher at 10ms. The length of confidence intervals are seen to be decreasing as the value of delay increases. Reno and Cubic appear to be giving very similar results at a delay of 100ms. Throughput is obviously seen to be decreasing for both, as delay increases.

Plot-4: Throughput vs Loss for Delay=10ms



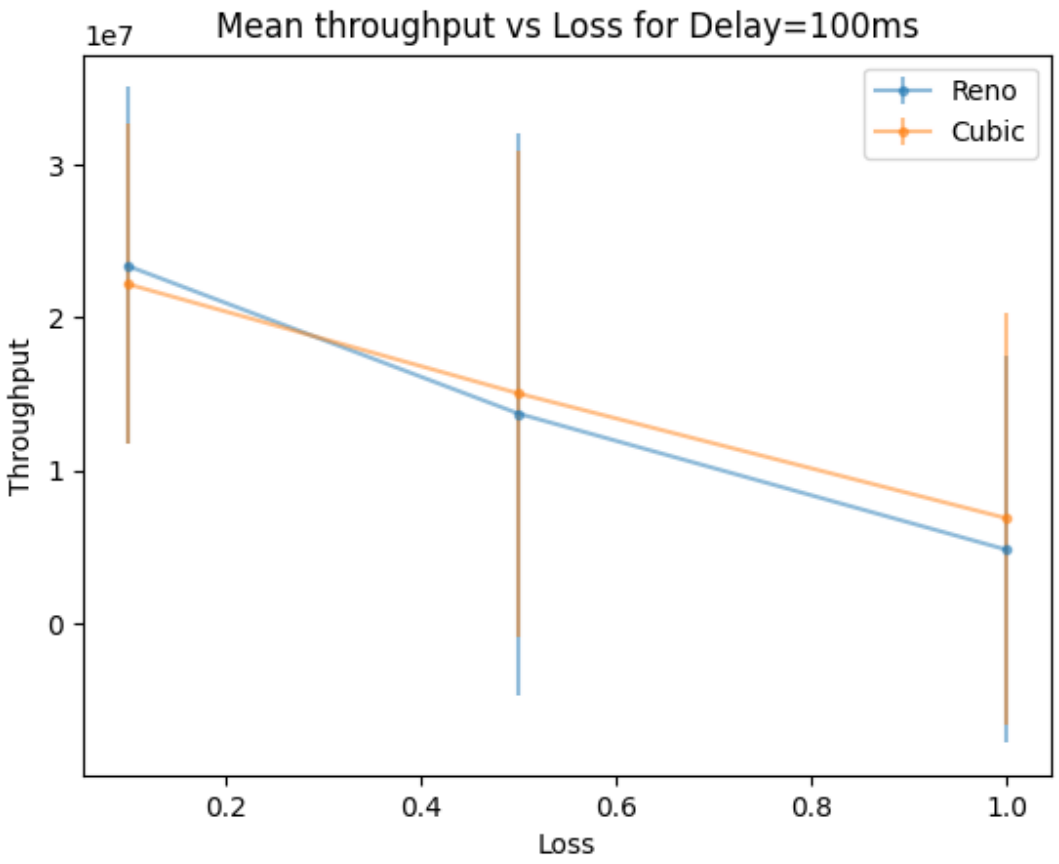
Mean throughput appears to be higher for cubic than reno at all concerned values. The length of confidence intervals are difficult to comment on from the obtained plot. As expected, throughput is observed to be decreasing as loss increases.

Plot-5: Throughput vs Loss for Delay=50ms



Mean throughput seems higher at loss of 0.1% and 1% for cubic. Surprisingly, the throughput is higher for reno than cubic at loss of 0.5%. The length of confidence intervals seem difficult to comment on from the plot. As expected, the throughput is decreasing for both as loss increases.

Plot-6: Throughput vs Loss for Delay=100ms



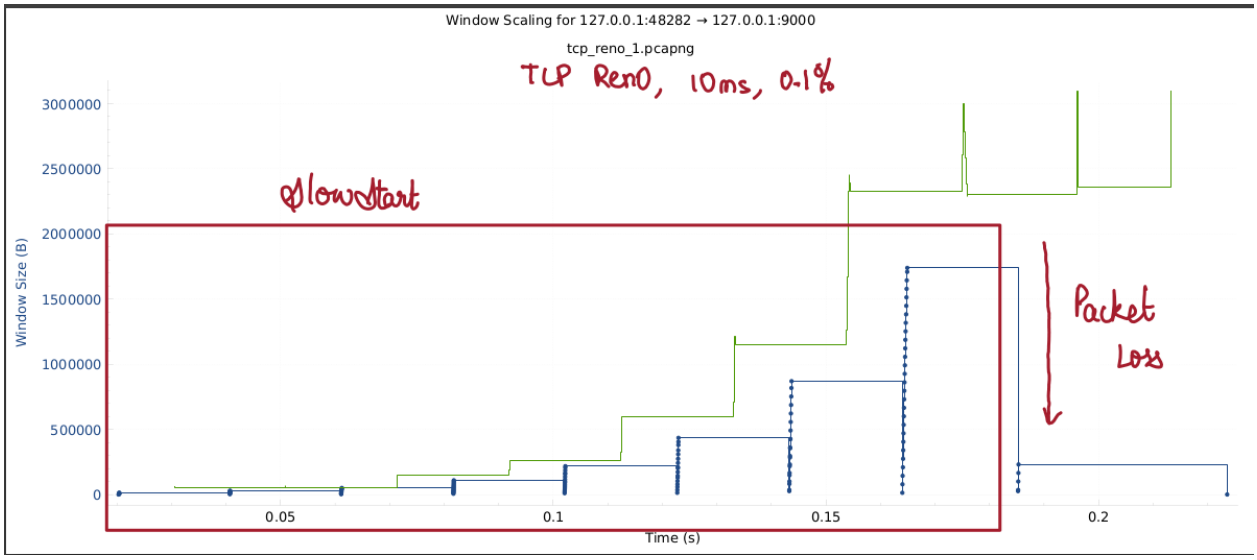
Mean throughput is slightly higher for cubic than reno at higher loss values, i.e. 0.5% and 1%. At a lower loss value, throughput of reno is slightly greater than throughput of cubic. The length of confidence intervals are difficult to comment on from the obtained plot. As expected, throughput is observed to be decreasing as loss increases.

It is evident from the plots obtained that Cubic is more aggressive than Reno, due to the faster window increase during congestion avoidance. Excluding a few instances where throughput of Reno is slightly greater

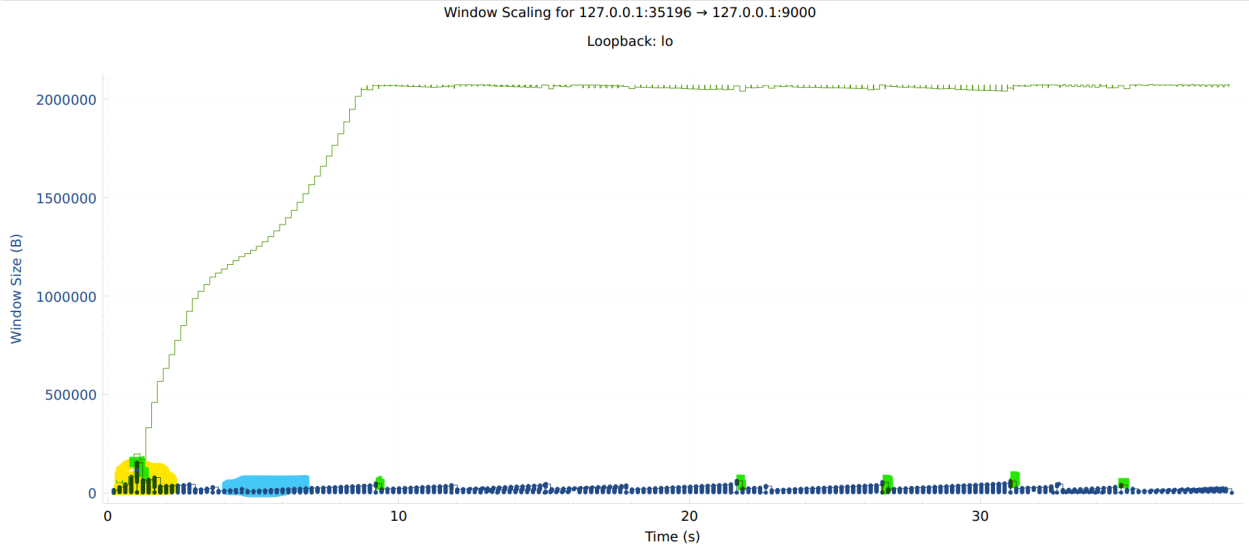
than throughput of Cubic, TCP Cubic has always given a higher value of throughput in the plots.
From plots 1-3, we observe that *increasing delay would decrease the throughput*, for both TCP Reno and TCP Cubic (with loss constant). Similarly, from plots 4-6, *increasing loss would decrease the throughput* for both Reno and Cubic (with delay constant).

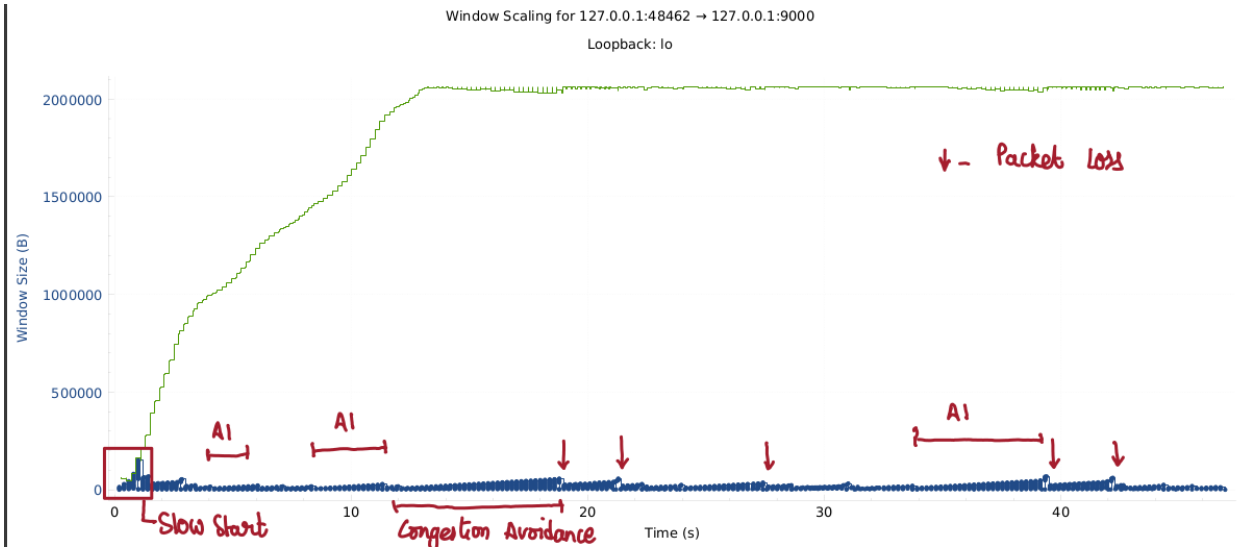
For the measurements using wiresharks, I have used Yellow for a region of slow-start, Blue for a region of congestion avoidance and Green to mark some obvious points of data loss.

TCP Reno: Delay=10ms and Loss=0.1%

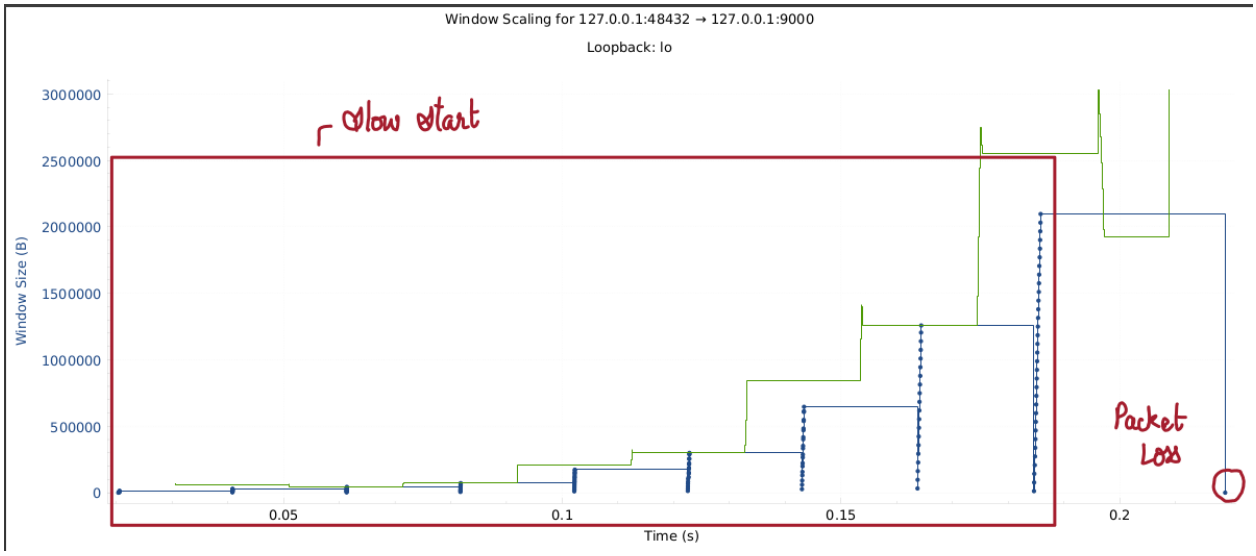


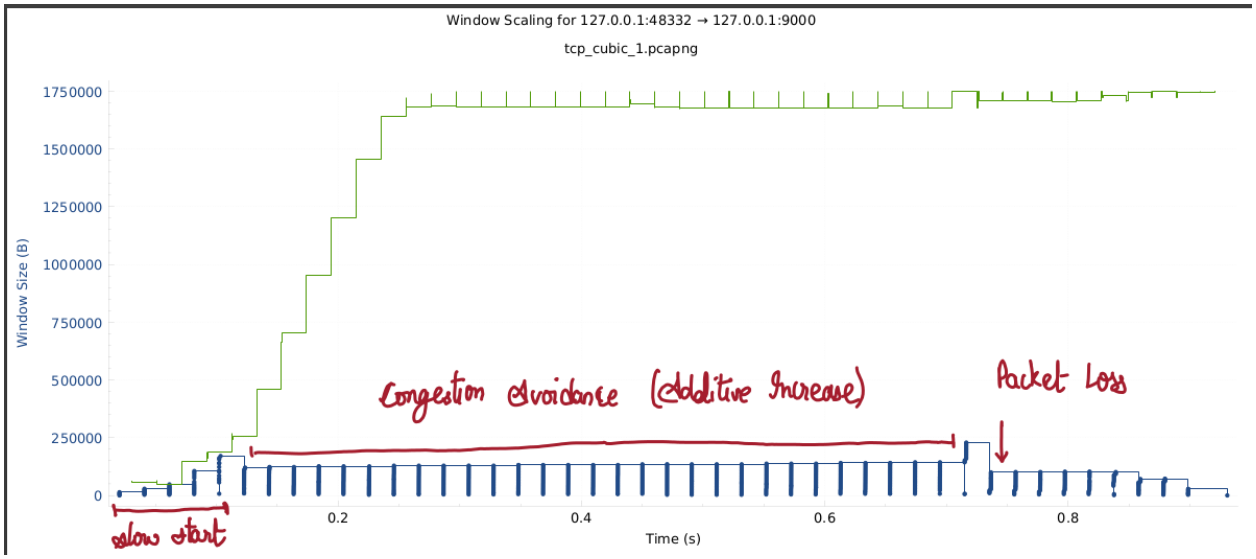
TCP Reno: Delay=100ms and Loss=1%





TCP Cubic: Delay=10ms and Loss=0.1%





TCP Cubic: Delay=100ms and Loss=1%