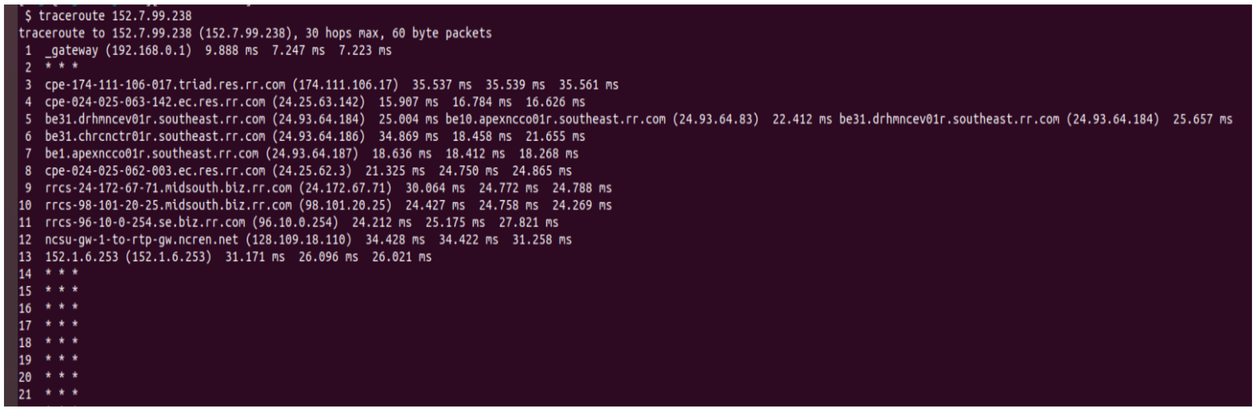
Project Report 2 :GO-Back-N ARQ

Task 1:

Calculate RTT Value:

We reserved a VCL server to act as the server while our personal laptop acts as the client.

Using Ping command from laptop, RTT value is approximately **35ms** on average. Also traceroute from laptop is as follows:



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 $ traceroute 152.7.99.238
traceroute to 152.7.99.238 (152.7.99.238), 30 hops max, 60 byte packets
 1  _gateway (192.168.0.1)  9.888 ms  7.247 ms  7.223 ms
 2  * * *
 3  cpe-174-111-106-017.triad.res.rr.com (174.111.106.17)  35.537 ms  35.539 ms  35.561 ms
 4  cpe-024-025-063-142.ec.res.rr.com (24.25.63.142)  15.907 ms  16.784 ms  16.626 ms
 5  be31.drhmncev01r.southeast.rr.com (24.93.64.184)  25.004 ms be10.apexncco01r.southeast.rr.com (24.93.64.83)  22.412 ms be31.drhmncev01r.southeast.rr.com (24.93.64.184)  25.657 ms
 6  be31.chrcnctr01r.southeast.rr.com (24.93.64.186)  34.869 ms  18.458 ms  21.655 ms
 7  be1.apexncco01r.southeast.rr.com (24.93.64.187)  18.636 ms  18.412 ms  18.268 ms
 8  cpe-024-025-062-003.ec.res.rr.com (24.25.62.3)  21.325 ms  24.750 ms  24.865 ms
 9  rrcs-24-172-67-71.midsouth.biz.rr.com (24.172.67.71)  30.064 ms  24.772 ms  24.788 ms
10  rrcs-98-101-20-25.midsouth.biz.rr.com (98.101.20.25)  24.427 ms  24.758 ms  24.269 ms
11  rrcs-96-10-0-254.se.biz.rr.com (96.10.0.254)  24.212 ms  25.175 ms  27.821 ms
12  ncsu-gw-1-to-rtp-gw.ncren.net (128.109.18.110)  34.428 ms  34.422 ms  31.258 ms
13  152.1.6.253 (152.1.6.253)  31.171 ms  26.096 ms  26.021 ms
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
```

For this first task, set the MSS to 500 bytes and the loss probability p = 0.05. Run the Go-back-N protocol to transfer the file you selected and vary the value of the window size N = 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024.

Plot the effect of Window size with average delay.

The Y axis is the average time delay vs Window size on the X axis. For this task, we used the following values for other

Parameters:

Size of the file which is sent= 1 MB

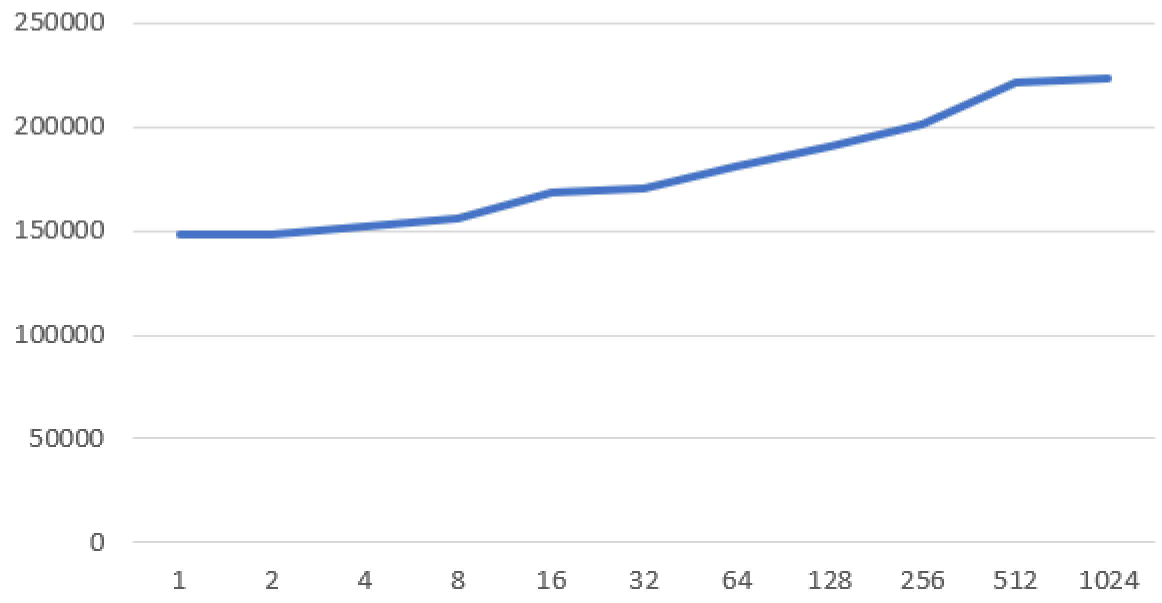
MSS = 500

Loss Probability = 0.05

Conclusion:

Initially, when the window size is ranging from 1 to 16, there is not much variation or pattern observed with delay for smaller window Sizes. But as the window size increases, average delay increases and relatively becomes stable with a slight increase for higher values of window size. This may be because after a certain high window, congestion might have occurred.

Plot:



Task 2:

In this experiment, let the window size N = 64 and the loss probability p = 0.05. Run the Go-back-N protocol to transfer the same file and vary the MSS from 100 bytes to 1000 bytes in increments of 100 bytes.

Plot the effect of MSS with average delay.

The Y axis is the average time delay vs Window size on the X axis. For this task, we used the following values for other

Parameters:

Size of the file which is sent= 1 MB

Window size = 8

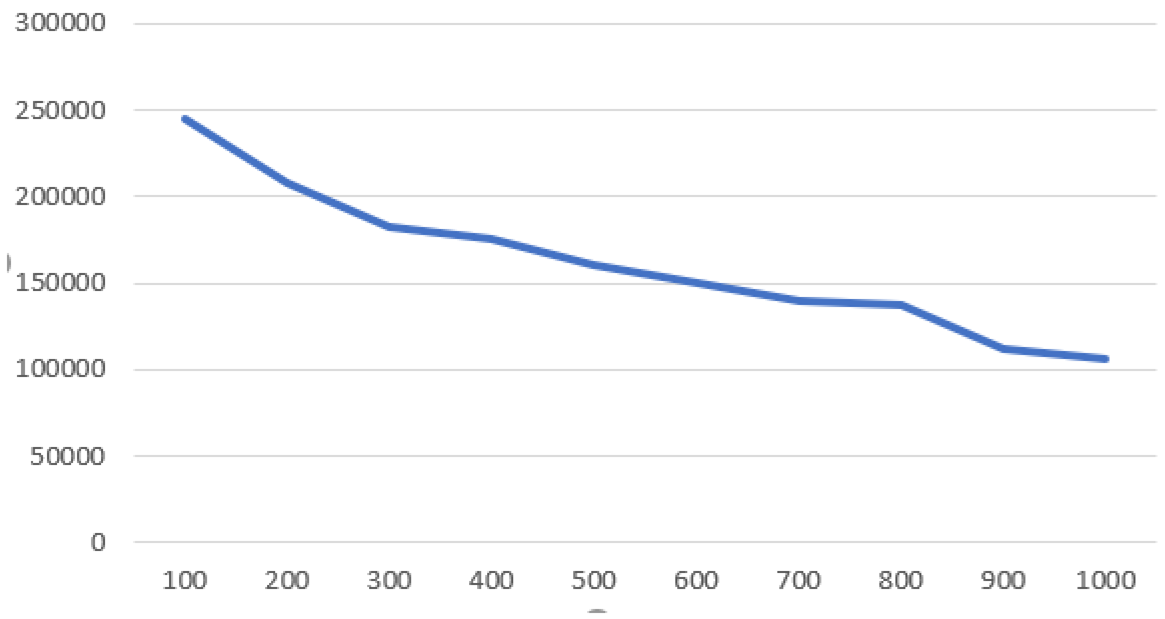
Loss Probability = 0.05

Conclusion:

We observe that as MSS increases the average delay decreases. This is because with higher segment size, data will be sent faster.

This is as expected because if we increase MSS, then it means data is being sent using lesser number of segments and the client will eventually have a smaller number of packets to send if MSS is increased.

Plot:



Task 3:

For this task, set the MSS to 500 bytes and the window size N = 64. Run the Go-back-N protocol to transfer the same file and vary the loss probability from p = 0.01 to p = 0.10 in increments of 0.01.

Plot the effect of Loss Probability with average delay.

The Y axis is the average time delay vs Window size on the X axis. For this task, we used the following values for other

Parameters:

Size of the file which is sent= 1 MB

MSS = 500

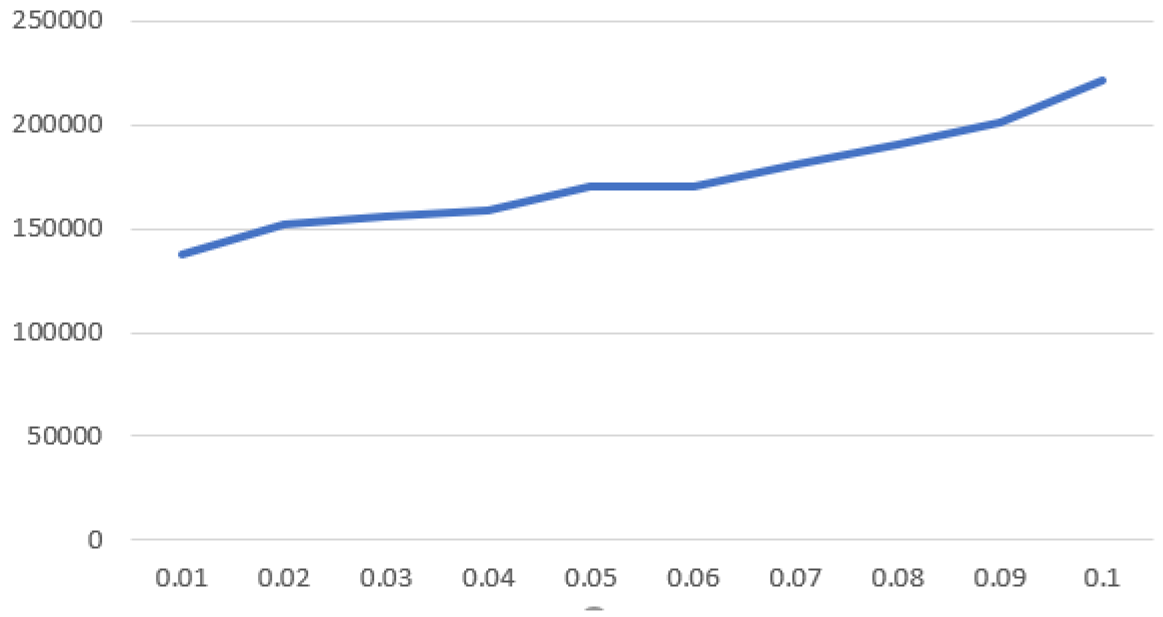
Window size = 8

Conclusion:

We observe that the average delay increases with increase in loss probability. This is because there are more packets being dropped with an increase in loss probability which eventually creates a timeout at the client side.

This graph is as expected.

Plot:


250000
200000
150000
100000
50000
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1