PROJECT REPORT

Submitted by:
Ankit Arora (200153992)
Shiv Shankar Barai (200151447)

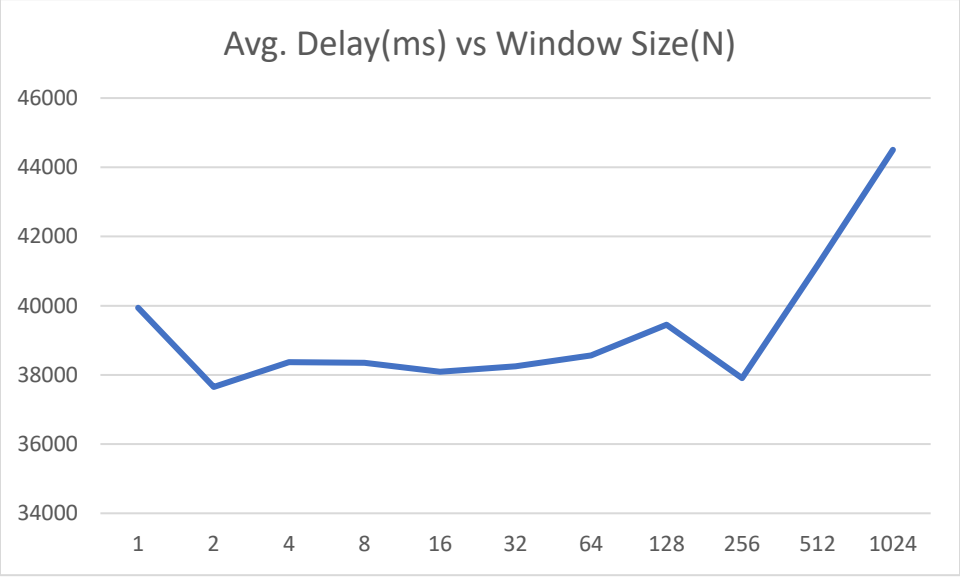
GO-BACK-N Protocol

Following are the file and RTT specifications:
Transferred file: send.txt
Size of transferred file: 2.89MB
Round trip time obtained from traceroute ≈ 134 msec.

Task 1: Effect of Window Size N

Parameters used for creating the graph:

File Size	2.89 MB
MSS	500 bytes
Loss Probability(p)	0.05
Window Size	Variable



Data used for plotting graph:

Window Size(N)	**Average Delay (msec.)**
1	39939.5
2	37651

4	38368
8	38345.4
16	38091
32	38247.8
64	38557.8
128	39445.4
256	37909
512	41165.8
1024	44504.4

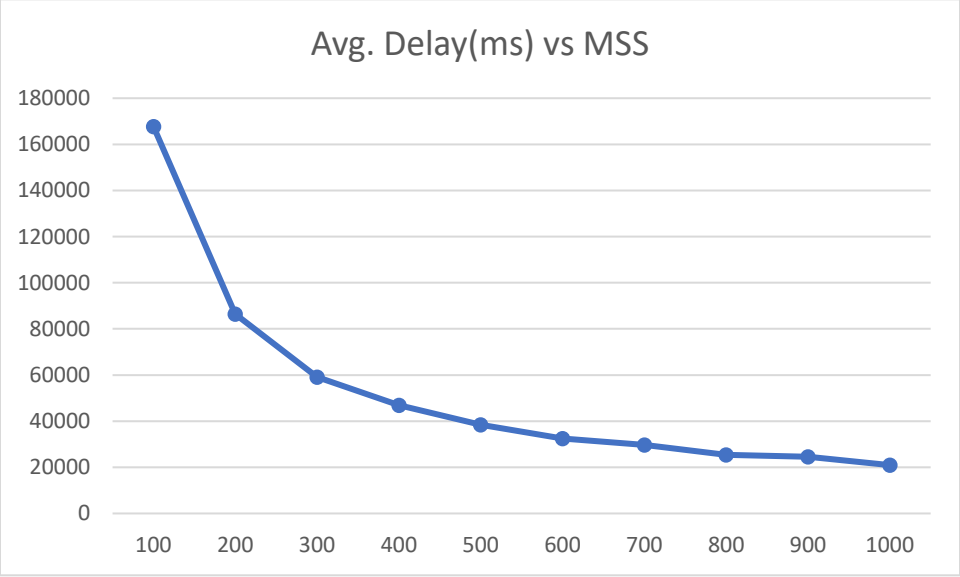
Explanation for Graph:

Small window size leads to slow transmission due to small number of packet transmissions each time. Increasing window size reduces delay to some extent due to larger number of packet transmissions. As window size is further increased, delay increases due to larger number of packet retransmissions in case of packet loss.

Task 2: Effect of MSS

Parameters used for creating the graph:

File Size	2.89 MB
Window Size(N)	64
Loss Probability(p)	0.05
MSS	variable



Data Used for plotting graph:

Maximum Segment Size(MSS in bytes)	**Average Delay(msec.)**
100	167742.4
200	86408.2
300	59141
400	46917.4
500	38432.4
600	32428
700	29730.8
800	25463.2
900	24611
1000	20953.8

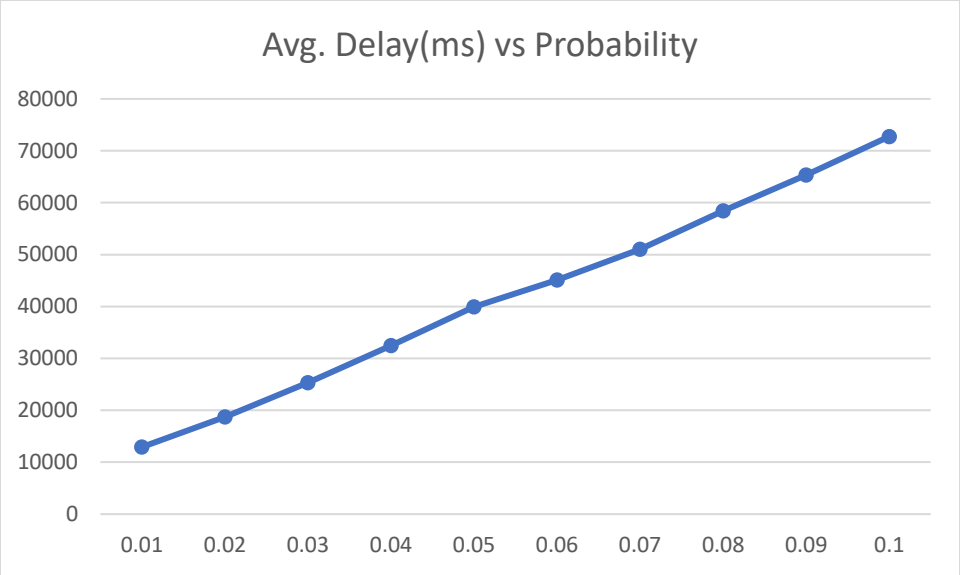
Explanation for Graph:

As the segment size increases, the number of packets to be sent decreases, which decreases the average delay to transfer the data. This works as long as the network bandwidth is enough to support the data traffic.

Task 3: Effect of Loss Probability (p)

Parameters used for creating the graph:

File Size	2.89 MB
Window Size(N)	64
MSS	500 bytes
Probability	variable



Data Used for plotting graph:

Probability	**Average Delay(msec.)**
0.01	12929
0.02	18735.8
0.03	25314.2
0.04	32492
0.05	39926
0.06	45116.2
0.07	51025.8
0.08	58421.2
0.09	65306.8
0.1	72755.6

Explanation for Graph:

As the probability of packet loss increases, the average delay also increases as more number of packets will be lost and this would require larger number of packet retransmissions.

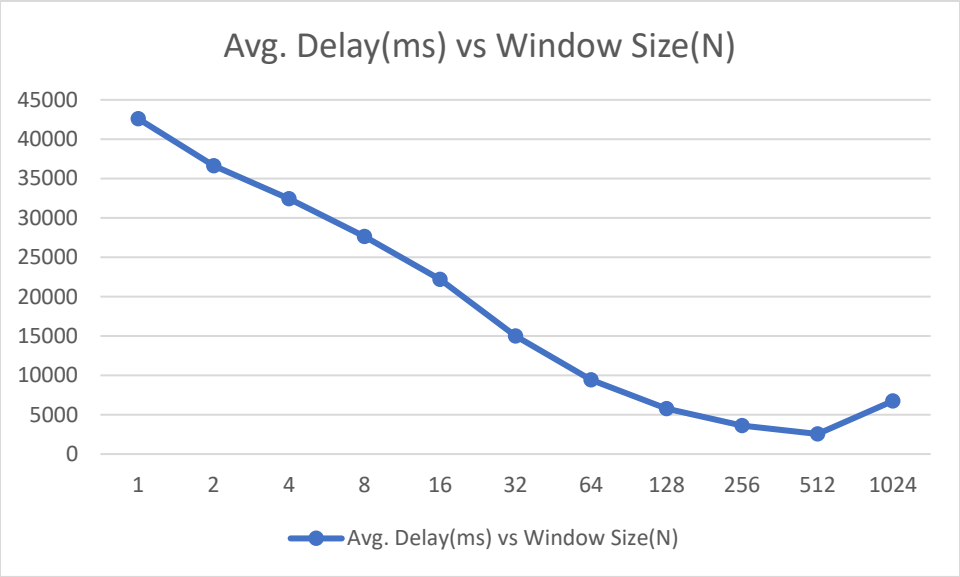
SELECTIVE REPEAT ARQ Protocol

Following are the file and RTT specifications:
Transferred file: send.txt
Size of transferred file: 2.89MB
Round trip time obtained from traceroute ≈ 134 msec.

Task 1: Effect of Window Size N

Parameters used for creating the graph:

File Size	2.89 MB
MSS	500 bytes
Loss Probability(p)	0.05
Window Size	variable



Data used for plotting graph:

Window Size(N)	**Average Delay (msec.)**
1	42609.2
2	36643.2
4	32449.2
8	27643.6
16	22190
32	15014.4
64	9423.8
128	5773.4

256	3611.4
512	2553.8
1024	6732

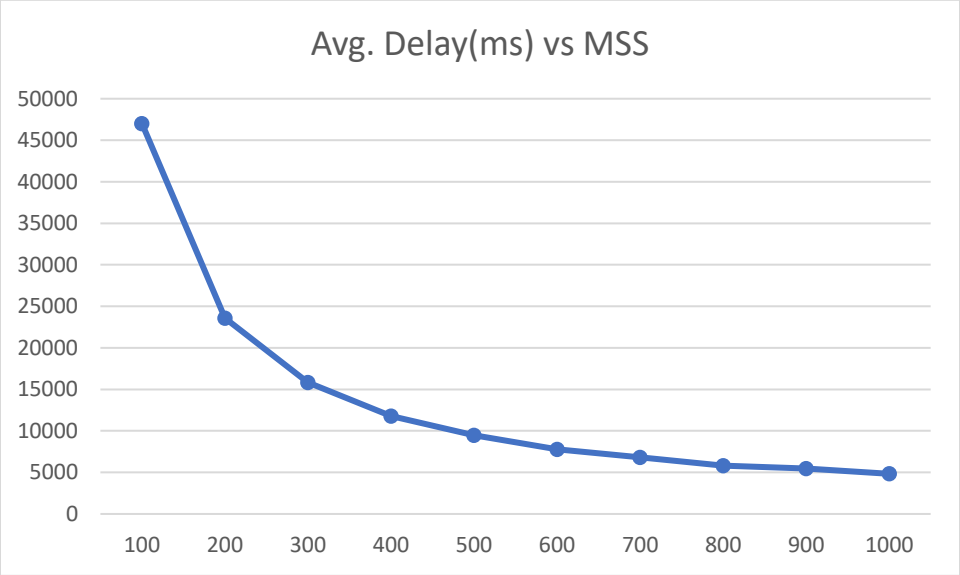
Explanation for Graph:

Small window size leads to slow transmission due to small number of packet transmissions each time. As window size is increased, delay reduces due to larger number of packet transmissions. An increase in delay at the end is due to more packet drops as window size increases.

Task 2: Effect of MSS

Parameters used for creating the graph:

File Size	2.89 MB
Window Size(N)	64
Loss Probability(p)	0.05
MSS	variable



Data Used for plotting graph:

Maximum Segment Size(MSS in bytes)	**Average Delay(msec.)**
100	47024
200	23578.4

300	15828.8
400	11782
500	9475
600	7781.8
700	6827.2
800	5836.8
900	5464.6
1000	4837

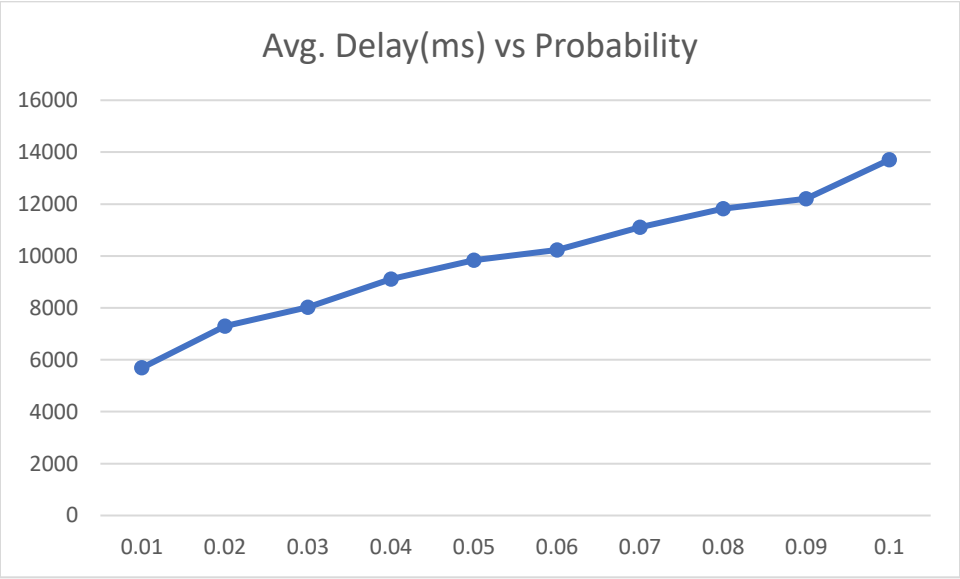
Explanation for Graph:

As the segment size increases, the number of packets to be sent decreases, which decreases the average delay to transfer the data. This works as long as the network bandwidth is enough to support the data traffic.

Task 3: Effect of Loss Probability (p)

Parameters used for creating the graph:

File Size	2.89 MB
Window Size(N)	64
MSS	500 bytes
Probability	variable



Data Used for plotting graph:

Probability	**Average Delay(msec.)**
0.01	5690
0.02	7301.8
0.03	8022.8
0.04	9114.2
0.05	9840.8
0.06	10236.8
0.07	11107
0.08	11824.2
0.09	12200
0.1	13703.8

Explanation for Graph:

As the probability of packet loss increases, the average delay also increases as more number of packets will be lost and this would require larger number of packet retransmissions.