

CSC 573 Project 2: Go back N protocol

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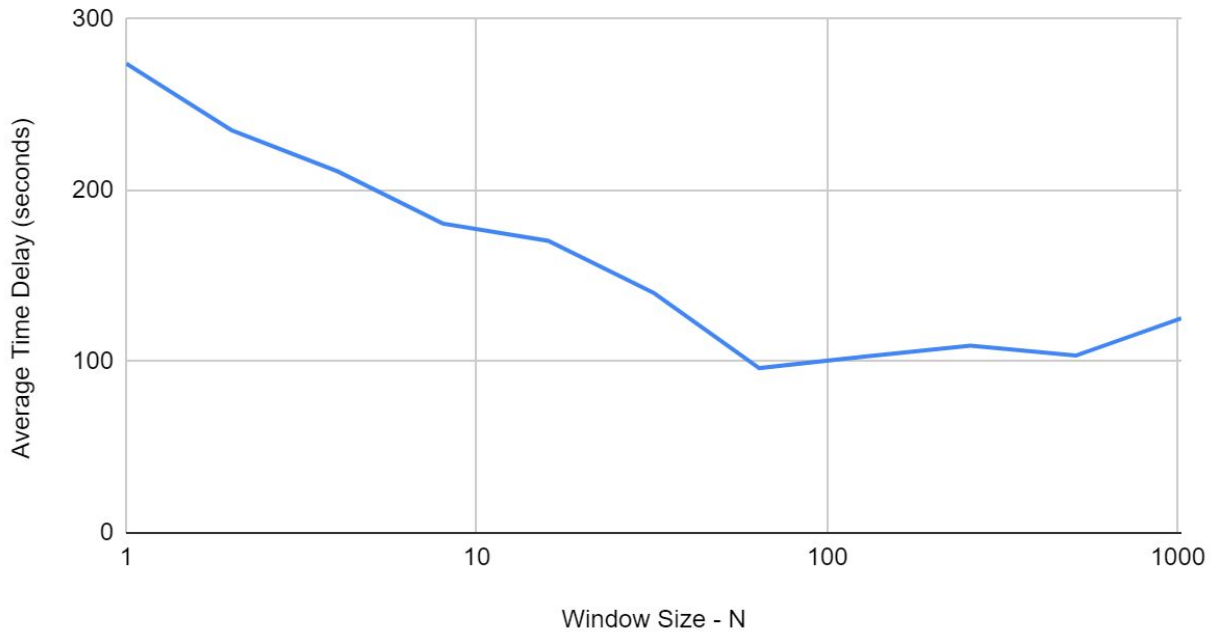
Note:

1. The Timeout timer value has been assumed to be 1 second for the following implementation.
2. Please refer to the instructions text file to run the code.

TASK 1: Effect of Window Size N

Task 1						
MSS = 500 bytes	p = 0.05					
N	Time Taken 1	Time Taken 2	Time Taken 3	Time Taken 4	Time Taken 5	Average
1	258.34501	260.47436	297.39007	281.32108	272.85405	274.076914
2	237.3552	238.3988	231.31755	233.16379	234.92041	235.03115
4	206.3031	205.73494	215.31006	207.31029	221.31961	211.1956
8	181.30955	179.64871	194.30708	179.7781	167.99622	180.607932
16	160.3367	164.41541	179.36477	174.79676	173.71762	170.526252
32	152.44825	136.49503	128.3472	142.9063	140.35147	140.10965
64	96.45709	96.63896	102.94918	93.39605	91.77637	96.24353
128	98.65977	94.14714	118.76674	104.25246	99.26434	103.01809
256	117.6506	92.25827	121.57601	109.46718	105.30942	109.252296
512	106.99994	104.20683	102.20085	101.48876	102.79806	103.538888
1024	125.43429	125.56329	125.74942	125.62434	123.89634	125.253536

Task 1: Effect of Window Size - N



Observation:

As can be observed from the graph, too small or too large of a window size will lead to a greater average time delay.

If the Window Size is small, then the packets are being transmitted very slowly. Hence, the delay is large. For example, consider $N = 1$, which would make it a Stop and Wait protocol, and hence, as we can see from the graph has the highest time delay value.

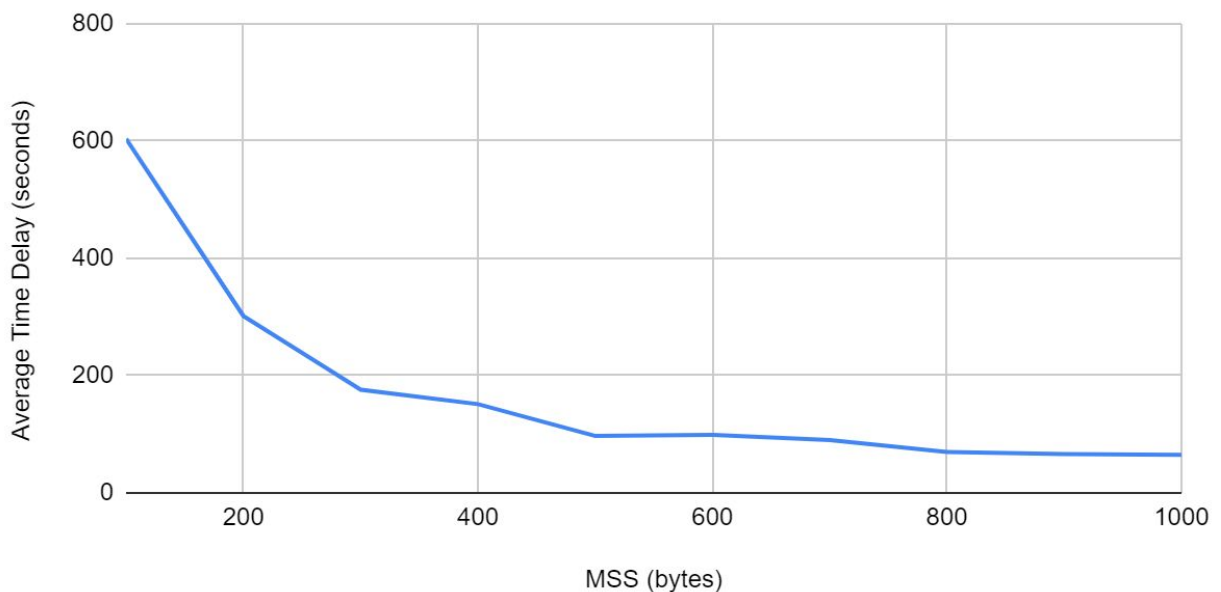
If the Window Size is large, then the packets that have been sent timeout easily, resulting in larger retransmissions. Thus, the optimum value for window size is somewhere between, and in this experiment, from the data, it is $N = 64$ (approximately).

TASK 2: Effect of MSS

Task 2						
N = 64	p = 0.05					
MSS	Time Taken 1	Time Taken 2	Time Taken 3	Time Taken 4	Time Taken 5	Average
100	592.90033	618.60504	596.30112	617.14204	593.10775	603.611256
200	305.99302	296.13831	298.23462	303.44983	304.48289	301.659734
300	169.58954	186.81742	173.58671	181.81547	168.08954	175.979736
400	165.49784	134.5495	162.44897	148.66431	145.47671	151.327466
500	101.73585	96.06608	100.8809	94.08982	92.04358	96.963246
600	107.34237	88.30161	105.36066	90.88397	102.05186	98.788094
700	92.30645	87.31153	92.02186	91.62551	86.90766	90.034602
800	67.24261	70.22423	70.20016	70.73411	69.74218	69.628658
900	58.19839	71.30716	70.28498	61.04919	69.21515	66.010974
1000	65.20386	61.26076	66.28059	64.55229	66.11199	64.681898

Task 2: Effect of MSS

N = 64 and p = 0.05



Observation:

As can be observed from the graph, as the MSS value increases, the average time delay decreases. This is because, as the MSS value increases, the number of packets required

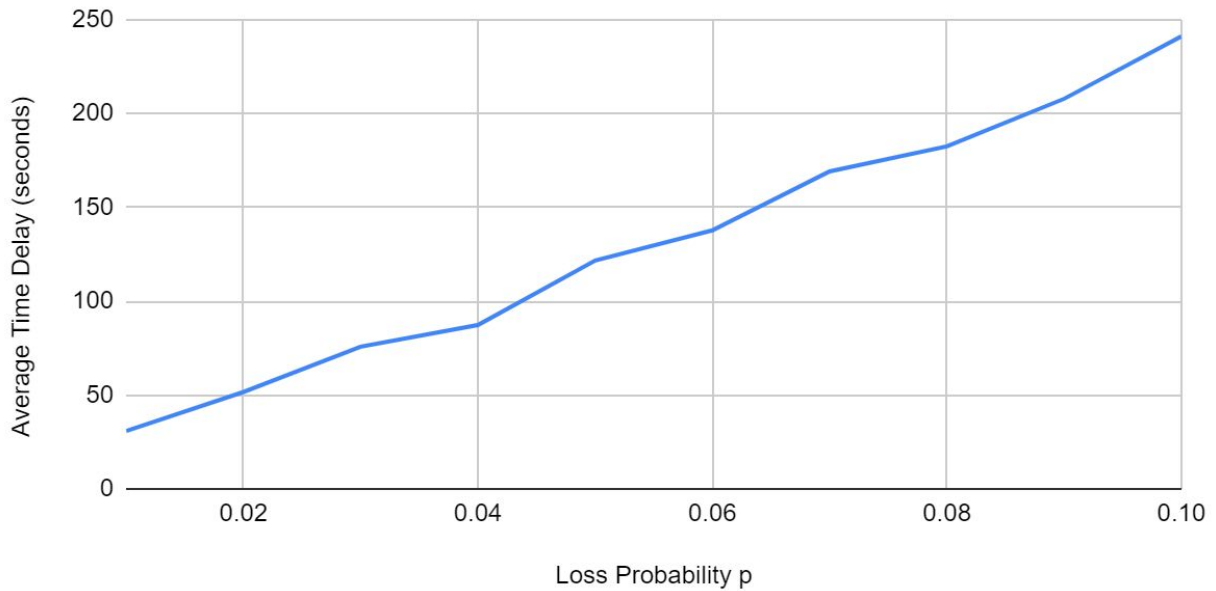
decreases, and hence the number of transmissions also decreases. With that, we have lesser packet loss leading to lesser retransmissions. Hence, it is better for the system to have a larger MSS value.

TASK 3: Effect of Loss Probability p

Task 3						
N = 64	MSS = 500 bytes					
p	Time Taken 1	Time Taken 2	Time Taken 3	Time Taken 4	Time Taken 5	Average
0.01	33.08541	29.08425	31.97839	28.25709	31.66847	30.814722
0.02	56.17591	42.14828	46.08337	58.3914	55.44385	51.648562
0.03	76.28926	75.34577	73.69343	75.95026	77.76005	75.807754
0.04	89.44285	82.40068	89.72454	85.66297	89.2914	87.304488
0.05	123.62916	120.60873	120.08628	123.24199	121.01379	121.71599
0.06	140.78066	137.66596	135.35162	136.73414	138.21873	137.750222
0.07	155.71372	164.81278	167.77244	191.8087	165.70365	169.162258
0.08	183.78774	180.7735	183.02622	181.95017	182.98401	182.504328
0.09	210.92892	204.84728	205.78978	209.67294	208.08118	207.86402
0.1	228.96902	251.08918	239.66379	241.37984	244.56153	241.132672

Task 3: Effect of Loss Probability p

MSS = 500 bytes and Window size - $N = 64$



Observation:

As can be seen from the graph, the value of the average time delay increases as the loss probability increases. That is because, as the loss probability value increases, the number of packets being dropped increases, with that, the retransmissions also increases. Hence, the time delay also increases.

Hence, for a system, it is better to have a low loss probability.