Project Report

Task 1: Effect of the Receiver Set Size n

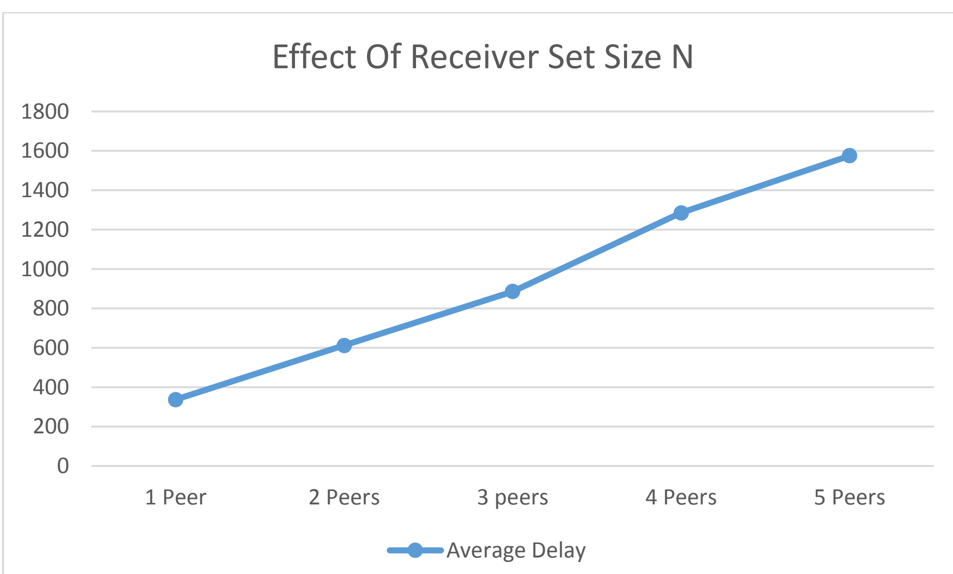
Readings

Number of Peers	1st Reading	2nd Reading	3rd Reading	4th Reading	5th Reading	Rounded Average
1 Peer	348404	324258	332152	349431	329752	336799
2 peer	602262	611632	615712	622703	609103	612282
3 peers	921563	866401	872106	880831	887903	885761
4 Peers	1298208	1258986	1276251	1308551	1282235	1284846
5 Peers	1582645	1602458	1542631	1572462	1579421	1575923

Average delay for N

N	Average Delay(in Seconds)
1 Peer	337
2 Peers	612
3 peers	886
4 Peers	1285
5 Peers	1575

Curve



Conclusions:

From the readings and the curve, it can be seen that the Average delay (Time taken to transfer a 10MB file) goes on increasing as the number of servers goes on increasing. The graph shows a linear relationship between the Numbers of receivers in the transfer and the average delay. This poses a scalability problem that often exist with client-server architecture. Thus, this type of system is not scalable after a certain number of receivers and the delay becomes too high.

Task 2 : Effect of MSS

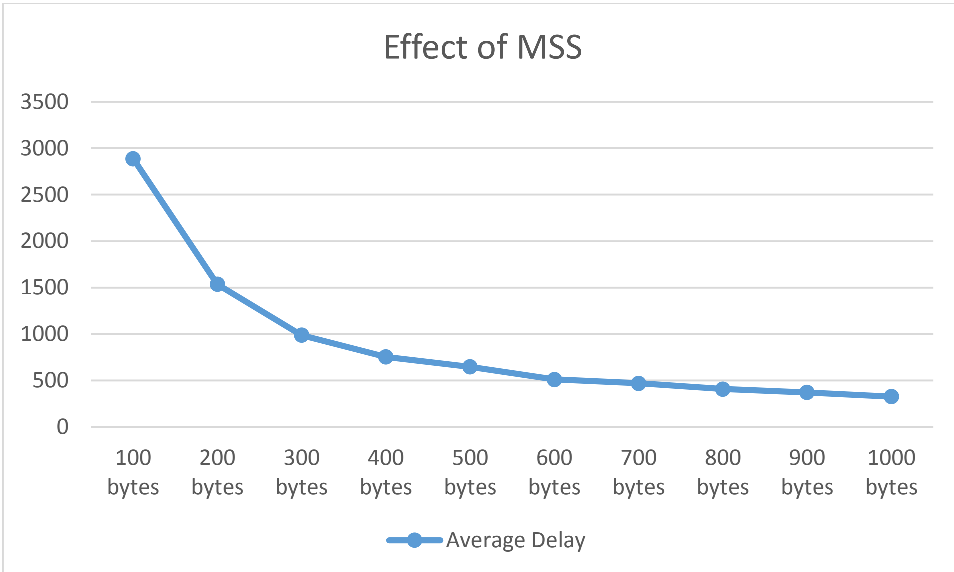
Readings

Number of Peers	1st Reading	2nd Reading	3rd Reading	4th Reading	5th Reading	Rounded Average
100 bytes	2837113	2849959	2825869	3121534	2815216	2889938
200 bytes	1550445	1420957	1519744	1750212	1431243	1534520
300 bytes	980376	981824	995841	1005211	975864	987823
400 bytes	752959	741496	749800	782410	742541	753841
500 bytes	647654	645828	644222	644857	654588	647429
600 bytes	546756	500141	495853	500152	512152	511010
700 bytes	487368	421203	475621	472153	481422	467553
800 bytes	366420	407930	421842	412152	424511	406571
900 bytes	363005	383731	368575	381240	351451	369600
1000 bytes	316304	343801	316506	328546	317562	324543

Average delay for MSS Size

MSS Size	Average Delay
100 bytes	2889
200 bytes	1535
300 bytes	987
400 bytes	754
500 bytes	647
600 bytes	511
700 bytes	468
800 bytes	407
900 bytes	370
1000 bytes	325

Curve



Conclusion:

From the graph, we can conclude that the average delay decreases as the MSS size goes on increasing. This is due to the fact that now the sender has to send less number of packets and thus wait from less number of ACK's from the receiver. This curve shows that it is very important to determine the correct size of MSS to transfer so as to minimize delays. Also, since the number of packets are less, the congestion in the network is also reduced (Since the number of packets are less, less ACK's needs to transmitted back). However, there is a limitation on the MSS size as well depending upon the physical medium. So, the graph does not converge to 0 and will become parallel to x-axis after some point of time.

Task 3: Effect of Loss Probability p

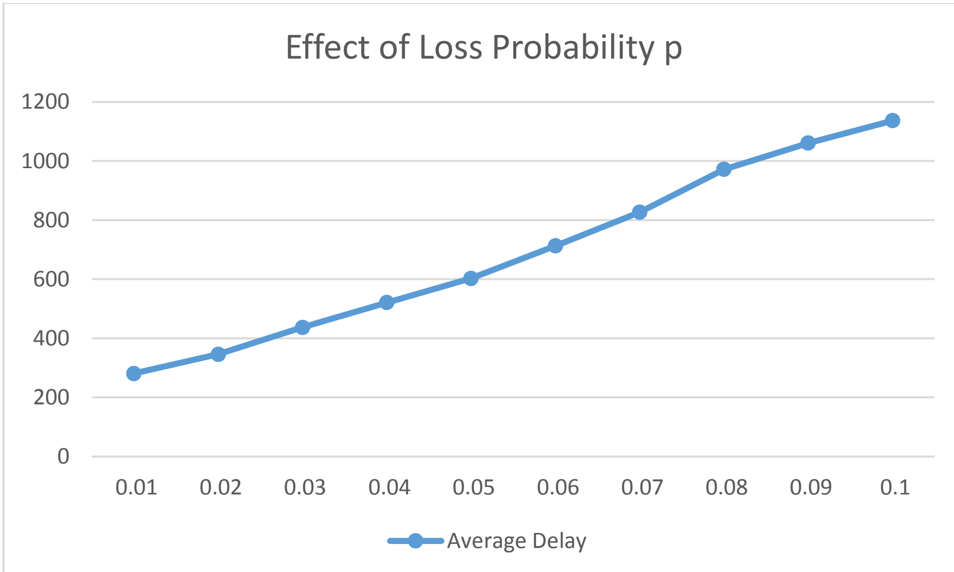
Readings

MSS Size	1st Reading	2nd Reading	3rd Reading	4th Reading	5th Reading	Rounded Average
0.01	277355	296864	255842	285137	291429	281325
0.02	378016	327941	336527	335846	352547	346175
0.03	419543	457022	435844	450244	425424	437615
0.04	555421	517440	505321	525211	502513	521181
0.05	555839	645726	608456	572415	633211	603129
0.06	730576	692757	682158	725428	738756	713935
0.07	826644	819404	831487	842450	815127	827022
0.08	954507	979791	978544	996843	952546	972466
0.09	1044925	1052779	1064515	1065841	1078494	1061310
0.1	1120220	1114108	1135483	1142542	1173523	1137175

Average delay for MSS Size

Loss Probability	Average Delay(in Seconds)
0.01	281
0.02	346
0.03	437
0.04	521
0.05	603
0.06	713
0.07	827
0.08	972
0.09	1061
0.1	1137

Curve



Conclusion:

Here in this curve, we can see that the Average delay increases linearly with the loss probability p. This is because as the loss probability ‘p’ increases, the chances of a packet being dropped increases. When a packet is dropped in the network, the receiver has no clue of it and thus the sender will wait for an ACK. Since the receiver has not received the packet, it will not send an ACK. Thus, the sender will keep on waiting till it timeouts. After timeout, it will again resend the packet. Thus, as ‘p’ increases, the frequency of timeouts at sender increases, and thus the average delay increases.

The average delay will go on increasing as the network become more unreliable.