Computer Networks Assignment

Performance of Nirbhar UDP under different network conditions

Group Members
Jain Jai Sandeep - 2017A7PS1585H
Prateek Hiranandani - 2017B4A70578H
Sahil Nair - 2017B5A71317H
Jatin Arora - 2018A7PS0551H
Rusabh Rakesh Parikh - 2018A7PS1217H

Specifications
Window Size = 1000
Packet size = 798 Bytes
Timeout = 1 sec

Performance in ideal network conditions
Data Received - 17548818 Bytes
Throughput - 260882.592 B/s

Note - The throughput depends on factors such as window size, timeout, and packet size.

Performance in different network conditions

Under all following conditions, the protocol was able to transfer the file.

1. Throughput vs Packet Loss

Loss	Data Received (Bytes)	Throughput (Bytes/sec)
10%	11802420	175335.341
20%	7285740	108598.595
30%	5169444	80377.3173
40%	3818430	54453.2230
50%	2667714	38959.1231
60%	1884078	27199.8231
70%	846678	11391.5725
80%	815556	9787.32988
90%	799596	5023.36392

Throughput Vs Packet Loss
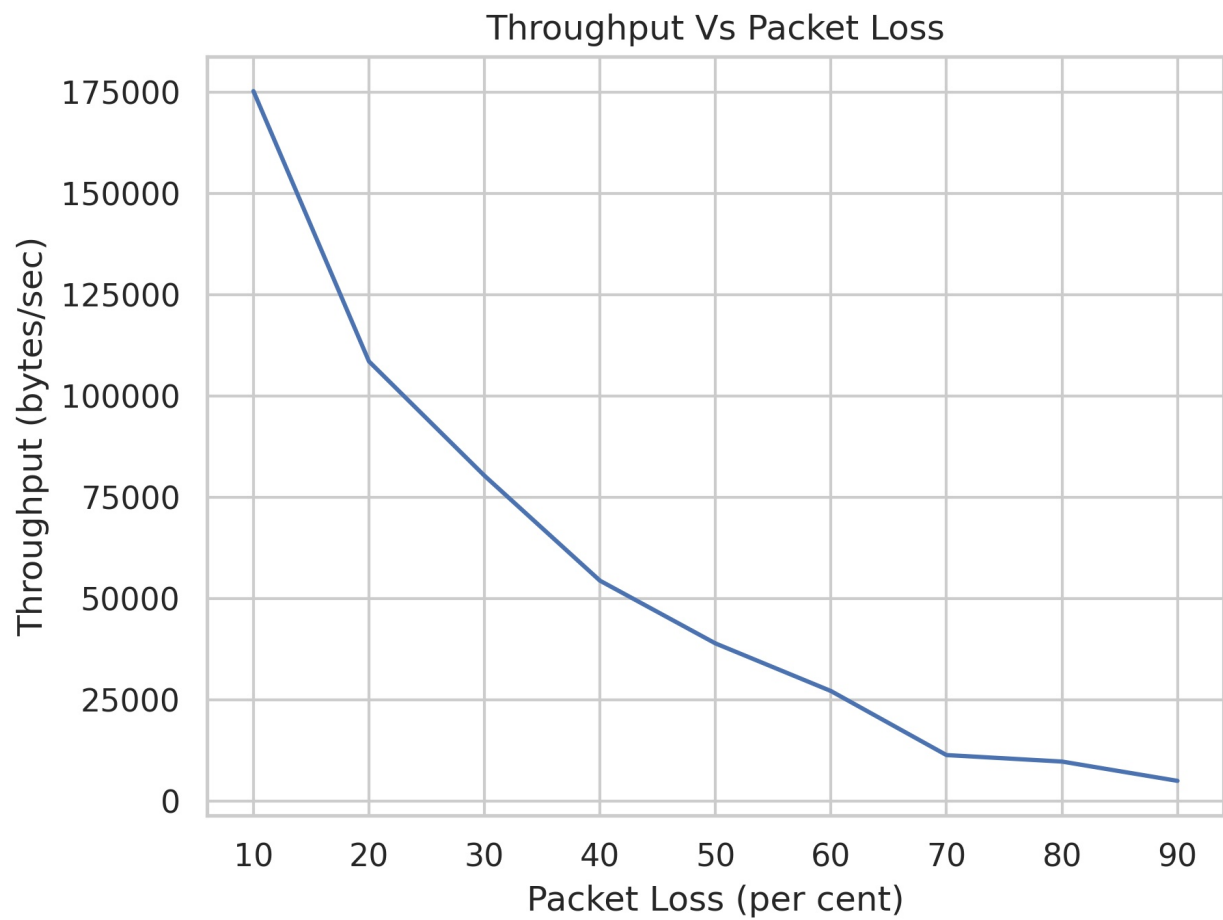
2. Throughput vs Packet Corruption

Corrupt	Data Received (Bytes)	Throughput (Bytes/sec)
10%	11483220	174357.064
20%	7922544	115792.938
30%	6127842	94528.6377
40%	4039476	58850.9139
50%	2982924	42503.8951
60%	1929564	25854.2246
70%	877800	11202.9047
80%	802788	7177.21253
90%	800394	4665.94561

Throughput Vs Packet Corruption
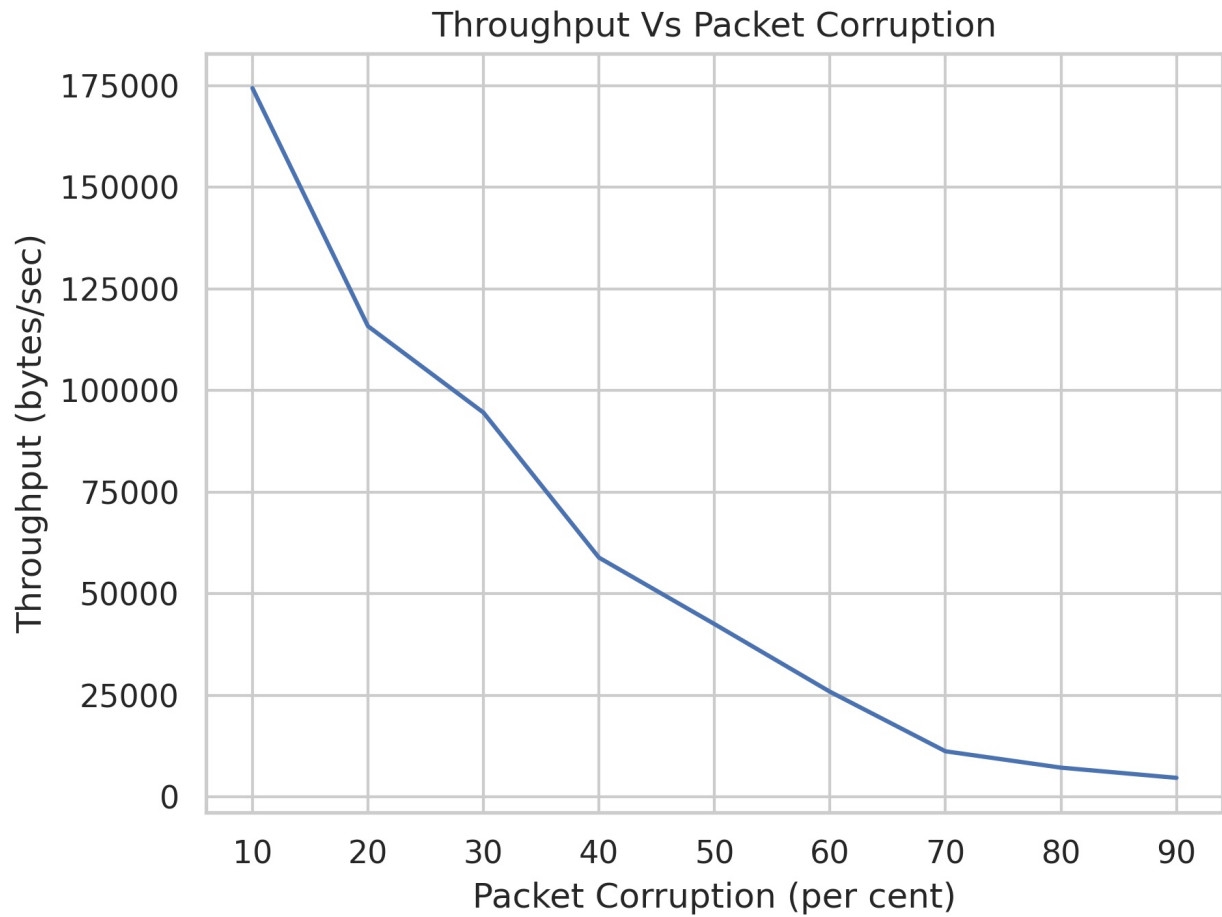
3. Throughput vs Network Delay

Delay (ms)	Data Received (Bytes)	Throughput (Bytes/sec)
100	29035230	445471.128
200	19761672	304831.072
300	18892650	295029.843
400	22022406	336265.824
500	16208976	242162.979
600	16193016	243601.719
700	15837906	232744.110
800	11006814	168366.885
900	11572596	168811.209

Throughput Vs Network Delay
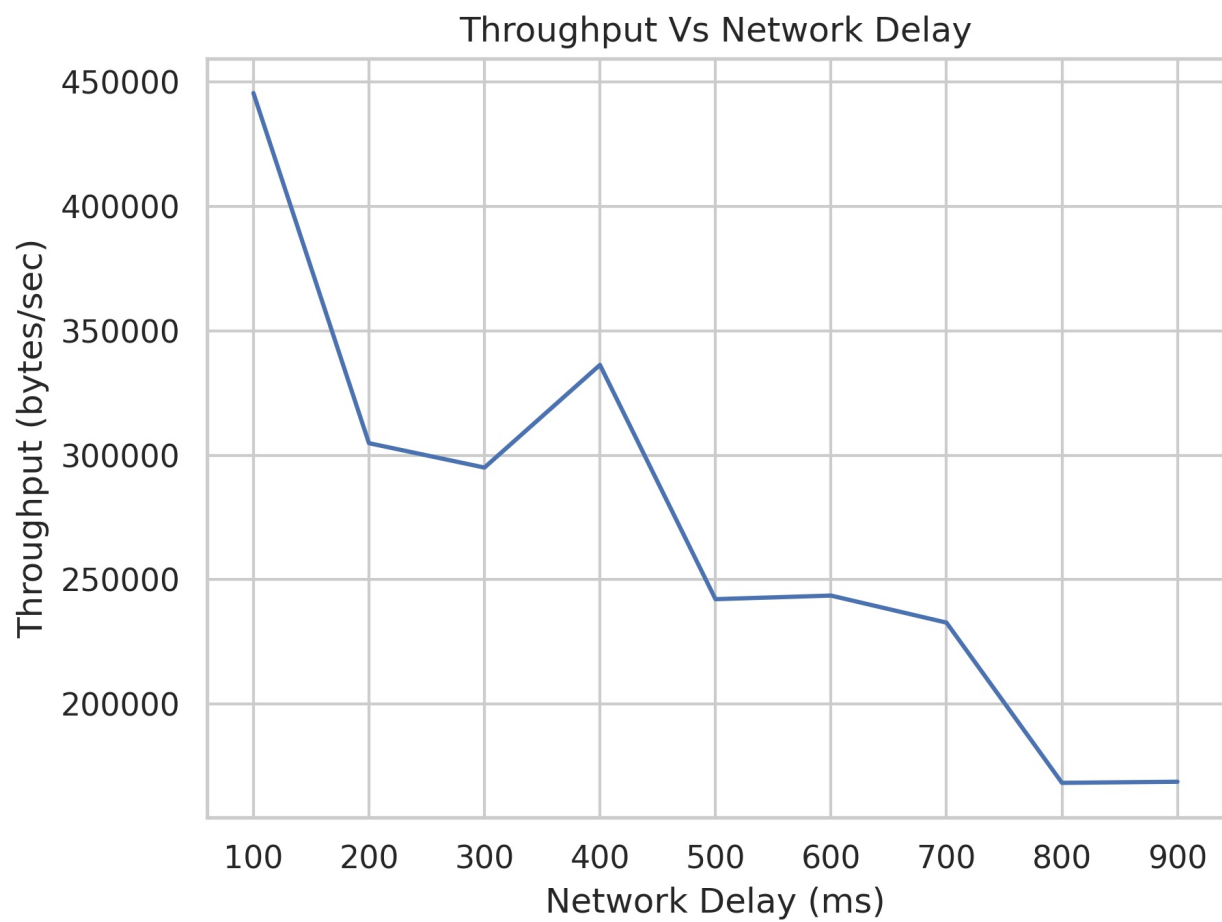
4. Throughput vs Packet Reordering

sudo tc qdisc add dev lo root netem delay <x>ms reorder 25% 50%

25% of packets (with a correlation of 50%) will get sent immediately, others will be delayed by *x* ms.

Delay (ms)	Data Received (Bytes)	Throughput (Bytes/sec)
100	31083696	475269.244
200	21849240	345567.574
300	22782900	359475.936
400	24370920	382492.052
500	16209774	237844.259
600	14357616	223006.513
700	12283614	184357.129
800	12742464	194916.180
900	13609890	201990.472