Analysis of Network Traffic in PA1
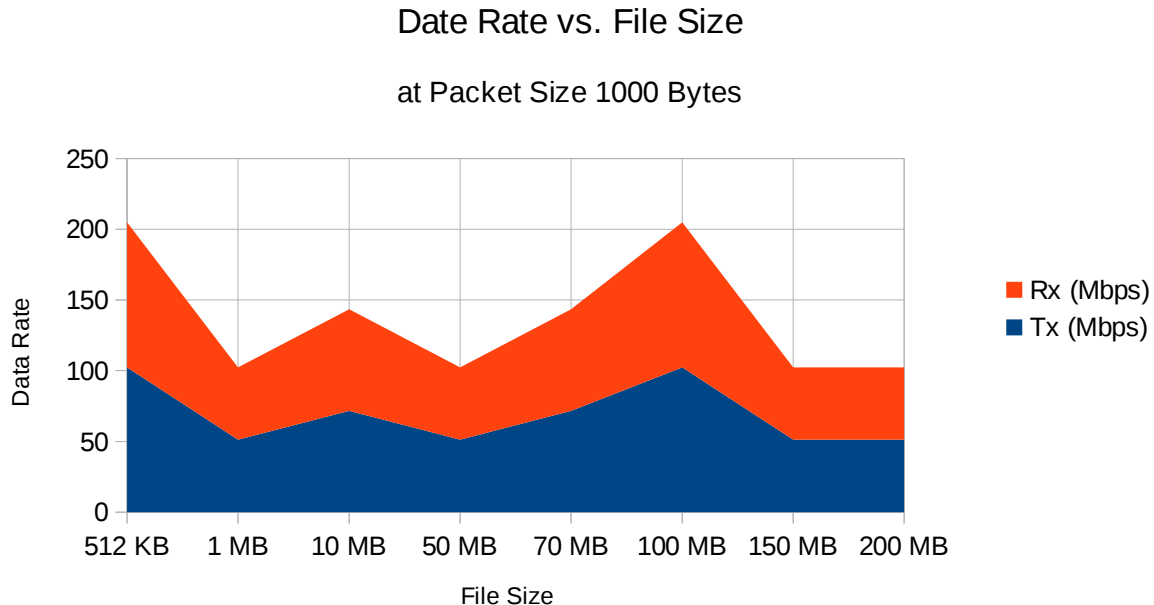
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4.1 Data Rates vs. File Size

After transferring various files of varying sizes but all with fixed Packet size of 1000 Bytes, the following data has been collected.

Date Rate vs. File Size

at Packet Size 1000 Bytes

Our general assumption has been that large size files will take more time for transferring and hence will have lower data rate. But we can see from the graph that even smaller files cannot guarantee higher data rates. One probable cause for this may be packet loss due to network congestion. Also the Tx and Rx rates are identical in the above graph which might indicate the streaming nature of TCP.

4.2 Data Rates vs. Packet size

Next we take a look at the varying packet size during file transfer and its effect on data rate.

Data Rates vs. Packet Size

on Fixed FIle Size 200MB
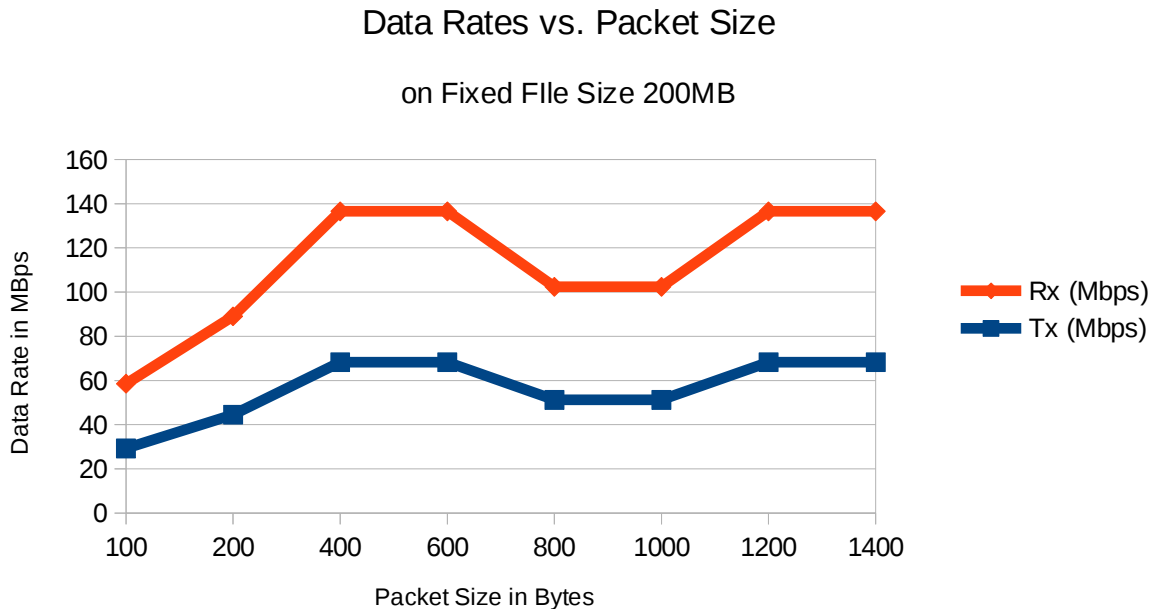
Our general assumption is if we increase the packet size then we will get faster data transfer because packet loss will be less then. Initially the graph follows that trend but then it dips because although we are setting the packet size, TCP sends data as byte streams, and it is up to the end system to form packet from that stream. So when we create large packets, packets may wait at the router for it to be filled completely before being send to next hop, hence the drop in data rate.

4.3 Data Rates vs. Load Variations

Here we fix the size of file as 70MB and packet size as 1000 Bytes. What we change here is the number of simultaneous transfers to load test the network. Initially we start with 1 transfer and then gradually increase the number of transfers to 3 and observe the data rates in these cases. Following graph gives a representation of that data.

Data Rates vs. Load Variations

on fixed file size 70MB and packet size 1000 Bytes
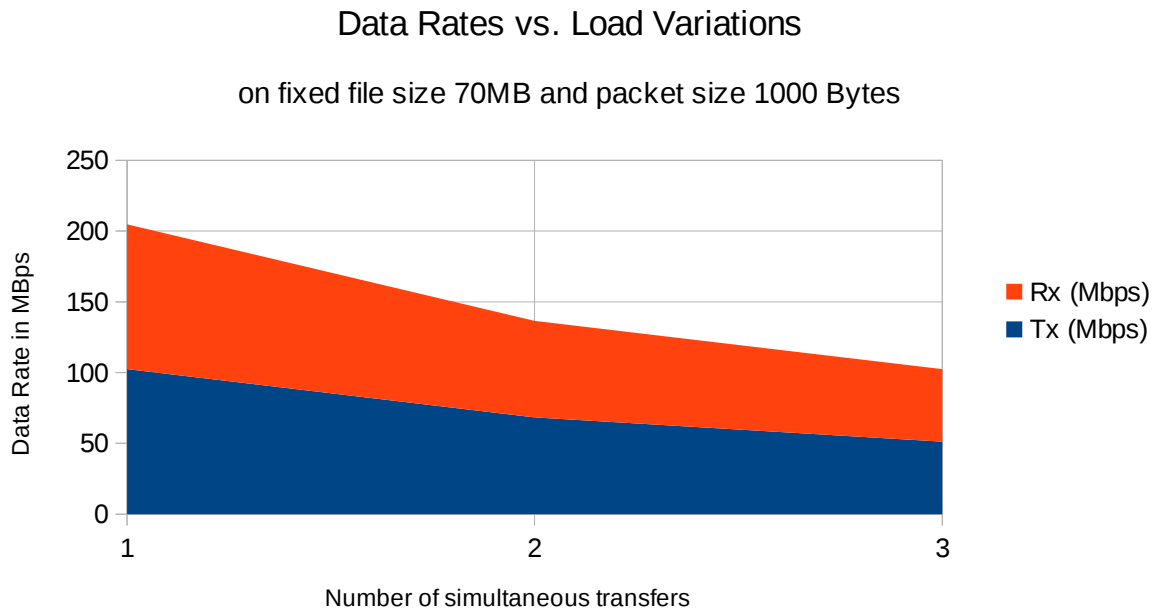
The graph show cumulative response of Tx and Rx one stacked upon other. We can see as the load increases, the performance drops. The average value of data rates for data points {1,2,3} comes to around {102 MBps, 68 MBps, 51.2 MBps}.

4.4 Iperf data

As instructed, after setting up iperf, we get the following data response.

Data Rate vs. Load variation

iperf data
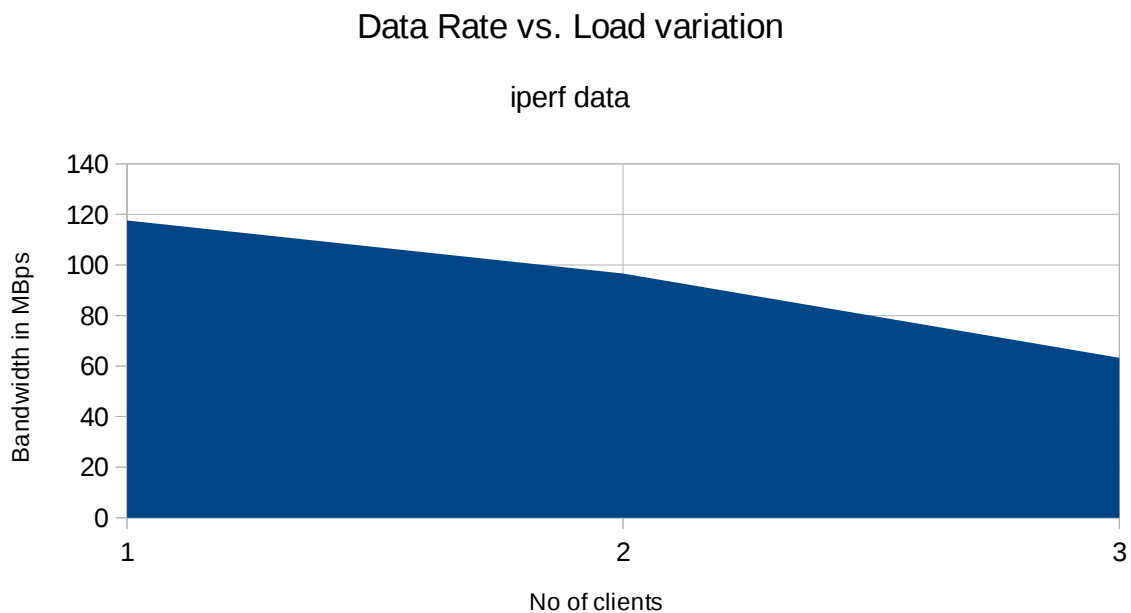
We get the values from iperf as {117MBps, 96MBps, 63MBps} which approximately follows our own result from the previous section.

Summary

The next graph summarizes all the data gathered in this exercise.

Data Rates vs. File Size vs. Packet Size

this is the complete data set