

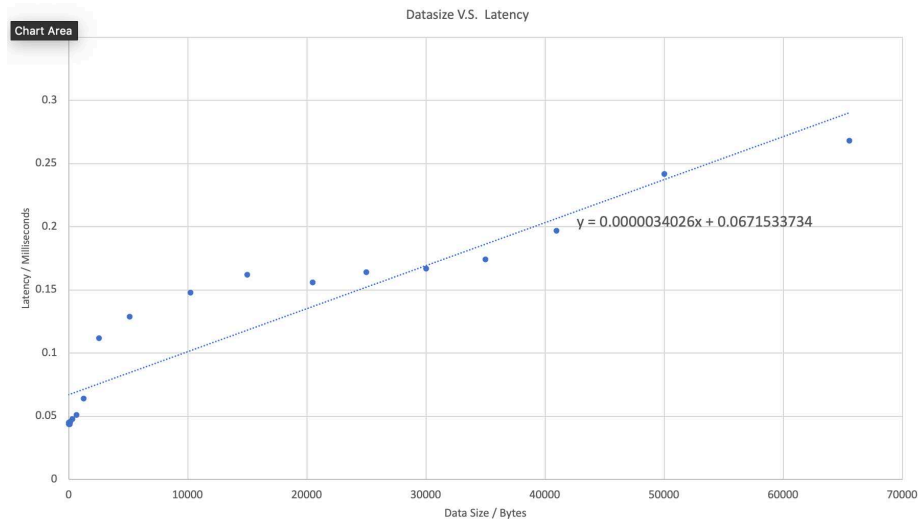
Part III Measurement

March 2021

(We take this part as optional for COMP429.)

Our measurement method involves analyzing code to find what are possible sources of delay that are irrelevant to network bandwidth, measuring average ping-pong message time delay, and estimating network bandwidth.

We repeat the measurement of average latency for different datasizes. Specifically, we vary the message size between 10 and 65535 systematically. The latency of each exchange is computed by wrapping two *gettimeofday* around send/rcv functions in the client program, and equals $(endtime.tv_sec - starttime.tv_sec) * 1000000L + (endtime.tv_usec - starttime.tv_usec)$. We then compute each average latency of message exchanges by dividing the total latency by the number of exchanges. Given the formula of computing latency (y) based on datasize (x), bandwidth ($\frac{1}{k}$), and independent delay (b), we are able to derive the values of k and b by applying linear regression on the data collected to construct a trend line. The data is shown below. After unit conversion, the independent delay of our program is 0.067 milliseconds, and the bandwidth is 2351.143 Mbps.



P.S.:

1. In order for a precise measurement, we reduce system calls to minimum.