

# COMPSCI 3650: Program #1

Due on Monday, February 19, 2018

Started on February 17

Completion time: 14 Hours

*Dr. Esposito 12:00pm*

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## Problem 1

Refer to the README.txt file for instructions on using the programs.

In order to experiment with the round-trip-time(RTT) and the throughput of packages over TCP based on message size, I built a TCP chat server with flexibility in place to allow for different package sizes and server delays. For testing RTT, the package sizes included 1, 100, 200, 400, 800, and 1000 bytes. To test throughput, the package sizes included 1K, 2K, 4K, 8K, 16K, and 32K bytes. I also ran tests on RTT and throughput with artificial delays of 1 second and 5 seconds to simulate network congestion. All necessary data is logged into a text file and used in R to generate graphs.

With 0 delay, we can see that RTT is somewhat unpredictable when the package size is small, but levels off into linear growth as the package size increases. We can also see that throughput has exponential growth as package size increases, however this probably levels off once you meet imposed throughput limits on the network itself.

With a 1 second delay, we see a significant increase in RTT, even when you disregard the 1 second delay. Something about the 1 second delay added an additional 1 millisecond delay on top of it. The throughput is also interesting, as we can see that it is significantly lowered. Throughput seems to be consistent with the size of the packages (32K package = 32KB/s throughput).

A 5 second delay has similar effects as the 1 second delay, with the throughput being even less. I chose not to include graphs of this data.