Middle East Technical University
CENG 519 – Network Security
Term Project – Phase 1 Report

In the first phase of term project, we develop a simple packet processor that subscribes to input subjects and publishes them to output subjects after some random delay. I have developed the processor in Go programming language, so I have refactored the provided Go processor code and added random delay feature to it. In this phase, I have preferred to give random delay as environment variable "MIDDLEBOX_PROCESSOR_AVG_DELAY_MS" to the processor program. To test the processor, after starting containers and entering into go-processor container, simply run "go build" command to build the processor binary. It creates the executable "go-processor". After build step, run "MIDDLEBOX_PROCESSOR_AVG_DELAY_MS=<delay-in-milliseconds> ./go-processor" to provide average delay to the processor. I have tested the processor with 13 different average delays (whose details and outputs are provided in the fork), measured round-trip time (RTT) and plotted a graph of it. One can observe the plot just below.

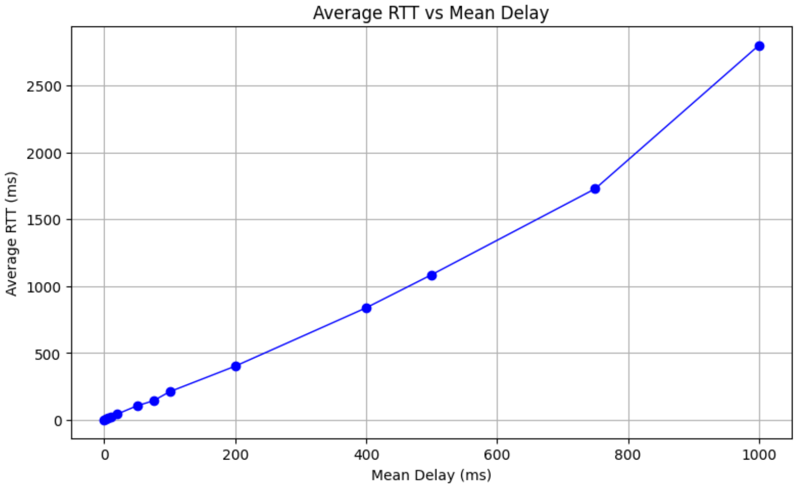

Figure 1: Average RTT vs mean delay in milliseconds

The first thing one may notice is that the relationship between average RTT and mean delay is close to linear with factor of 2. The reason behind the factor of 2 is that each ICMP echo-request packet from host "sec" to host "insec" follows the path "sec → mitm → processor → mitm → insec". Then, its corresponding echo-reply follows the path "insec → mitm → processor → mitm → sec". Hence, within an RTT, a packet visits processor twice, and in each visit, it is delayed (with mean delay in average). However, there are outliers such as the case where input mean delay is 750 ms and 1000 ms. I think this happens due to the number of ping packets (where I run "ping -c <count> insec", and I have sent 100 packets for each case) sent from "sec" to "insec". As the delay between 0 and twice the provided input is generated randomly for each processed packet, the distribution of generated delays may cause a bit larger RTT values for the last two cases.

Berhem Şervan Gök - 2231959