

# Network Security Term Project Phase-I Report

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March 15, 2025

## 1 Introduction

This report presents the first phase of the project, which involves using a processor that introduces random delays to Ethernet frames and analyzing its impact on network latency. The source code and details are available at: [GitHub Repository](#).

## 2 Project Objectives

The main objectives of this phase include:

- Utilize one of the provided processors or develop your own to introduce random delays in Ethernet frames.
- Conduct ping tests to analyze the impact of delays on round-trip time (RTT).
- Plot a figure showing the mean random delay on the x-axis and the average RTT on the y-axis.

## 3 Experimental Setup

The provided Python processor was used to introduce random delays in Ethernet frames. The delays were generated using the `expovariate()` function from the Python `random` library, which models an exponential distribution. This method ensures that shorter delays occur more frequently than longer ones, simulating realistic network conditions.

## 4 Experimental Results

Ping tests were performed with increasing random delays. 100 packets were transmitted for each mea-

surement. The results are summarized as follows:

Avg. Delay (ms)	Avg. RTT (ms)
0	5.689
0.005	5.314
0.025	6.383
0.050	6.872
0.075	6.919
0.100	7.220
0.250	7.324
0.500	8.271
1.000	9.199
2.000	11.534
3.000	13.150
4.000	14.140
5.000	17.553
10.000	27.010
50.000	112.211

Table 1: Ping Test Results with Random Delay

## 5 Conclusion

The results show that increasing random delays in Ethernet frames leads to higher RTT values. The effect becomes significantly noticeable beyond 1 ms delay, with extreme RTT variations observed at 50 ms. These findings provide insights into how controlled delays affect network latency, which is critical for applications requiring real-time communication.