CENG519 - Project Phase 1 Report

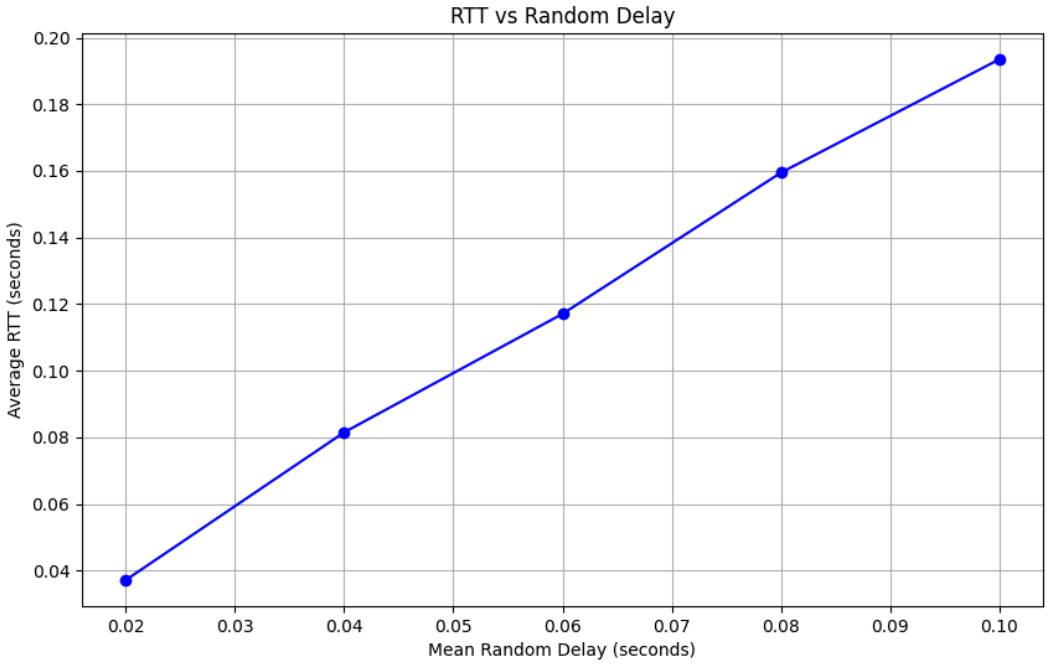
Implementation:

- **Processor Logic:** Implemented in Python; subscribes to `inpktsec` and `inpktinsec` topics, introduces random delays (0 to 100 ms), categorizes delays into fixed intervals (0.02, 0.04, 0.06, 0.08, 0.10 seconds), and publishes frames back to `mitm` on corresponding topics (`outpktinsec`, `outpktsec`).

- **RTT Measurement:** For ICMP packets, RTT is estimated as twice the introduced random delay. Measurement data were collected over intervals of 60 seconds.

Results and Analysis:

The resulting measurements clearly indicated an increasing linear relationship between the added mean random delay and the average RTT. The categories that were analyzed are graphed below:



The plot provided demonstrates that the RTT increases proportionally as expected with the added delays. The experiment's observed linear trend confirms that the implemented processor correctly introduces the intended delays and accurately measures their impact on RTT.

Conclusion:

This phase successfully demonstrates the functionality of a basic middlebox that manipulates packet transmission timing. The results clearly reflect the expected behavior, showing a direct proportionality between induced packet delay and observed RTT. Future phases could explore additional complexities, such as packet modification, reordering, and loss simulations.