ICMP Pinger Program Report

Group Report & Individual Report

Computer Networks

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3/10/2025

Group Report

For this project, I decided to work individually as I wanted to challenge myself to see how fast I could successfully complete the program. This was my first chance to truly program in a while, so I really enjoyed being able to implement new features and learn a lot along the way.

Program Task Completion

As outlined in the instructions, I completed all necessary tasks. In addition, I also implemented the following features to improve the functionality of the program:
- Implemented the additional RRT metrics of standard deviation and jitter
- Added ICMP error code interpretations (extra credit task)
- Added command-line functionality, such that it takes arguments into the script and utilizes it in the ping function (see demos for more details)

Group Meeting Times/Minutes

N/A – My rubber duck and I had some good conversations throughout the process, however.

Resources

Throughout this process, my rubber duck and I used the following resources:
- [Python 3 Socket Programming Skeleton](#): Computer Networking: A Top-Down Approach, 8th Edition by James F. Kurose and Keith W. Ross
- ChatGPT to find relevant host addresses (various continents)
    - Help from google overview to determine exact server locations
- [Python statistics module documentation](#)
- [Geekforgeeks Socket Programming in Python Tutorial](#)
- [Python time module documentation](#)

Individual Report

Individual Tasks and Accomplishments

- Implemented missing code from skeleton
- Added additional documentation and function declarations
- Added additional features (highlighted above)
- Debugged (a lot)
- Made initial designs/pseudocode
- Designed and Implemented demos
- Writing report

Hours/Efforts and Challenges

Collectively, I likely put around 8 very focused hours into this program, with the biggest challenge being fully understanding the skeleton code. To overcome this challenge, I slowly read through the code, determining functionality and parameters, and expanded upon the documentation for each function. This gave me a very good path to implementing the rest of the code, gaining understanding as I implemented.

Exercise Takeaways

Throughout this program, I learned an immense amount about socket programming, which was previously a topic that I had little to no exposure to. I now feel confident enough to potentially start tackling more complex tasks from scratch, using this basic pinger as a reference. Additionally, I learned an immense amount about the Internet Control Message Protocol (ICMP), seeing the low-level operations and details about processes and functionality. Lastly, I learned about the influence of server location when sending/receiving requests to different web servers. This exercise proved to be extremely beneficial, showcasing important networking concepts in an interactive method.