

Final Report

What happened:

In this lab we wrote code that allowed two people to have a conversation over the engineering network with voice over IP. This lab did not really have any additional hardware components needed besides a computer with python installed, and a way for the computer to connect to the network. We used the socket and threading libraries to have a computer simultaneously be a client and a server that communicated with the other device by connecting client to their server and their client to the server. We used pyaudio, wave, and struct libraries to capture and digitize the audio. For the jitter buffer we utilized the approach discussed in class and the pickle library to serialize and order the packets. We originally wanted to use opus to compress and decompress the audio but we were unable to successfully download and use opus. Instead we used zlib which compressed the audio, just not consistently and as much as an audio codec. This caused some inconsistency on meeting the transfer rate requirements, but every other requirement was met successfully.

Who worked on what:

Finding/understanding suitable libraries: Everyone
Compression/Decompression: Junyan Yang, Cole Pierce
Audio to digital, digital to audio: Pengyang Xiang
Client/serve connection: Yao Ma
Jitter buffer: Pengyang Xiang
Latency: Yao Ma
Data transfer rate: Cole Pierce
Integration: Everyone
Test procedure and other documentation: Everyone
Progress report: Junyan Yang
Final report: Cole Pierce, Junyan Yang

Success/Failures as a group:

Learning from the last lab we improved our group communication and started early enough to deal with the problems we encountered. We also made sure to break the lab down into four parts so everyone was able to focus on a different part of the problem. Several times in this lab we were able to pivot to new implementations when the libraries or methods we wanted to use were not working. Again, we tried to meet at least twice a week and discuss problems we were having with different aspects of the lab. Because this lab was further into the semester there was a few times when we were not all able to meet because of other projects/midterms when we thought we could. For the next lab we hope to better anticipate this and plan our meetings and progress on the lab accordingly.