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CS 422 - Computer Networks
Project Proposal

Project Definition:

Screen sharing software uses many different methods to allow sharing a screen remotely from a server or user acting as server with other user(s) as client(s) who may be able to provide inputs as feedback.
For this project we will be exploring the technology behind Screen Sharing application and attempt to build a prototype version of the application. Our goal is to study the different aspects of this application like UDP, network latency etc.

Motivation:

In our world, technology is used in many different ways. One particular way is to allow multiple individuals to communicate with each other from a distance over a network. Currently, throughout the world, the majority of the population is under lockdown within their homes due to the pandemic, COVID-19. Universities, companies and schools are forced to be closed to help prevent further acceleration of the spread of the virus. However, activities that are done within these organizations are not hindered due to the force shutdown. This is strictly because of online remote communication. Online remote communication is currently an essential part of what is keeping the world on track. Schools and universities are currently resorting to online screen sharing methods that allow teachers or professors to teach in an environment such that students are able to learn and engage freely outside of the class.

Related Work:

Link:
https://www.researchgate.net/publication/335866573_Real-time_Screen_Sharing_Using_Web_Socket_for_Presenting_Without_Projector
Summary: In this paper, three researchers created a screen sharing application using the WebSocket protocol to share one device's screen to multiple other devices through a computer network (e.g. phone, tablet, laptops and desktops). The motivation of the researchers was somewhat similar to our motivation. They stated that using a projector was nice for an in classroom environment; however, there are times when the projector may not function properly or be broken. Hence, the person conducting the presentation is directly reliant on the project. Having to move to a remote sharing system is better and voids the dependency on the projector. The researchers presented a diagram of their design of the screen sharing application. What will

be different from their experiment to our project is that we will be using a UDP connection instead of a TCP connection that WebSocket uses. We are more focused on having a real time screen sharing platform instead of having a reliable connection but slower screen sharing platform.

Proposed Work:

- We will be building a real time Screen Sharing application which will let a user to stream his window to one or more users. For now we will be hosting the stream only on the local network but may upgrade to external communications.
- Use UDP as transport protocol.
- Compatible on Unix
- Create a Server for the individual that will share his or her screen.
- Create a Client that will serve and display the shared screen.
- We will first develop a simple server to client application and later in the future we will expand towards having multiple clients connect to the server.

Schedule:

Planning Phase: April 6th - April 8th - devise software architecture
Sprint 1: April 9th - April 14th - implementation of fundamental source code for server-client screen sharing
Sprint 2: April 15th - April 21th - enhancing simple server-client (improve frame rates and have the server/client robust) and begin on new features.
Sprint 3: April 22nd - April 29th - continue working on additional features, testing, and start documenting the project (report).
Resulting Phase: April 30th - testing and final submission

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