Jack Taylor and Luke Kurlandski
Dr. Yoon
CSC345-01: Computer Operating Systems
April/May 2020

Project 4 Report

We implemented all requirements of the Networking Project, except for the extra credit file transfer. Our program provides clear user-instructions during runtime on how to use the various features.

Please note that every client must connect one at a time. After running the client executable, the client will ask for a username and chatroom information. The client MUST enter this information before another client attempts to connect.

The server maintains a list of active clients. Every time a client joins or quits, the server prints out the updated list. The list includes the client's file descriptor, their username, and their associated chatroom (-1 if they are not in a room ie they will broadcast to all clients).

Seven clients may join and broadcast messages between themselves. The messages only go to the clients who did not send the message. Messages which are broadcasted globally go to all clients, including the ones in private chatrooms. However, when clients in a private chat room send a message, it is only sent to other clients within that particular chatroom.

When a client connects, it is required to enter a username. When that client broadcasts a message, the username is part of the message. Thus, when other clients receive the message, they know which client sent it. The information is printed onscreen.

The server allows for three chatrooms to exist simultaneously. Messages sent between clients in a chat room are only broadcast within the chat room. To create a new chatroom, the client should run its executable with "new" as the third command line argument. If all three chatrooms are occupied and a new one cannot be established, the request will be blocked, and that client will be assigned to perform standard broadcasting to all clients. To join an existing chatroom, the client's third command line argument should be numeric to indicate which chatroom it wants to join. If the chatroom does not exist, the request will be blocked, and that client will be assigned to perform standard broadcasting to all clients.

In the case that the client does not supply a third command line argument, after entering a username, the status of all chatrooms is queried from the server. The client is then asked to choose one of three options. The user may enter an 'n' to create a new room. The user may enter a room number to join an existing room. The user may enter an 's' to not join a room and perform the standard broadcasting procedures to all clients. The error handling described in the previous paragraph, for if the user breaks chatroom rules, still applies.

Finally, upon creation, every client is assigned a random color. The color is randomly assigned using a seed from the CPU's clock to provide "true" randomness. Thus, that client's messages, in both standard and chatroom broadcasts, will appear that color.