

OS Assignment 2

Implementation Details

Server Code

Server socket is created and is binded to **port 30000**.

We have used **FD_SET** to monitor the server socket to check for new incoming connections from clients. When a new client is connected it sends its username. If this username is unique, the user is registered, else client is prompted to enter the username again.

Then we have used **FD_SET** to monitor the socket descriptors of all the connected clients to check for any received messages. When a message is received, it is parsed into two strings:-

1. The user for which this message is intended. If this user is 'All', then that means this is a broadcast message, else it is a specific user name. If no such user exists, then the client is informed.
2. The actual message to be sent. The username of the user from which this message came is added to the start of the message. For example, if Ram sends a message "Hi" to Shyam, then the message that Shyam will receive would be "Ram:Hi".

If the user exists, the message is sent to this user.

Client Code

A socket is created and it is connected to local address "**127.0.0.1**" using **port number 30000**. (same as server)

The client is shown a message "Connected to server" and is prompted to enter a user name.

1. If the chat room is full, client is shown appropriate message and is exited.
2. If client enters username as "All", then client is asked to enter another username as "All" is reserved for broadcast message.
3. If client enters username that already exists, then client is asked to enter another username.
4. Else the client is registered and is ready to send and receive messages.

For listening and sending messages simultaneously, we have **forked** another process.

One of these is constantly receiving messages from the server and the other one is constantly sending messages to the server.

Compile and Running the program

- Run the command "**make**" to generate the object files "server" and "client".

- On one terminal, run the server program using the command “./server”.
Now for each client, open another terminal and run the command “./client”.

Input Format

The message format is “<username>:<message>”.

1. **For broadcast message, the username is “All”**. For example, “All:Hello, how are you?”
2. Example for personal message- Suppose two users are connected to the server, Ram and Shyam. So if Ram wants to send a message “Hi” to Shyam, then Ram would type “Shyam:Hi”.

Expected Output

If on the client screen, a message is shown “<name>:<Message>”, this means that another client with username=name has sent this message.

Error Values

All the below errors are handled by printing appropriate messages-

1. New user registration errors-
 - a. Number of users <= Max users supported.
 - b. Unique username must be given.
2. While sending a message the username specified must be connected to the server.
3. Multiple errors are handled related to creating/binding/listening to sockets.