COMP3331 Assignment 1 Report

Program Design

There are a total of five classes in this program.

Server.java

The primary objective of the server class is to execute and run the server. When executed, the server takes in the arguments including the port, blockDuration, and timeout. Furthermore, the program is responsible for storing information that is required across all Clients running at any time and on any IP. This includes:

- **Users:** The server stores a list of the users. By storing a list of users, the server is also able to store all of the user's details, including their username, password, as well as blocked users, offline messages, and more. The user credentials are also scanned in when the server starts.
- **BlockedIPs:** It is the responsibility of the server to store a list of the blocked IP addresses, because the list can be accessed at all times, enabling the server to easily check whether an IP address had been blocked.
- **ClientThreads:** The server stores a list of the threads that are currently running. Each thread is provided with the blockDuration and timeout. Doing this enables each of the threads to communicate between one another.

Client.java

The client class is executed for each client. When executed, it takes in the IP address of the server and its port. This class is responsible for taking in commands from the user and displaying output from the server. It is also responsible for terminating the client when a user logs out.

ClientThread.java

For each Client that is executed, a new ClientThread is created. The thread is responsible for communicating between the client and the server. It accepts input from the client, processes the input appropriately, and prints out the response to the appropriate clients. Hence, most of the tasks such as messaging, broadcasting, blocking, and timing are completed in this class.

User.java

This class stores all of the information for each user. This includes the user's username and password, a list of users that the user has blocked, and a list of the user's offline messages. Furthermore, the class also stores information on the last time that the user was online, as well as information about the user's password block.

BlockedIP.java

This class is used by the server to store a list of the blocked IPs. Since each of the blocked IPs require the IP and the time it was blocked, it is a cleaner design to store each blockedIP as an individual object.

Application Layer Message Format

- This program aims to display the Real-Time Messaging Protocol (RTMP). Similar to this protocol, the program maintains persistent connections to one server, and clients can connect at any time to the server.
- The server stores all of the important information about the clients, and the ClientThreads can access this information to process commands by clients.
- This program works in a way where the server and client continuously communicates with one another.
- Furthermore, the messages sent are also similar to how real messages are sent. For each message sent, the header stores information about who the message is being sent to (the username) and the data stores the actual contents of the message. The server then looks at the header of the packet, finds the appropriate recipient, and sends the data to that user.

How the System Works

1. Compile the files using javac *.java
2. Start running the server using java Server <port> <blockDuration> <timeout>
3. For each client that you wish to run, type java Client <IP address of server> <port>