Computer Science (CSC3002F) Networks Assignment 1

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List of features and explanation for inclusion

Displaying of online clients – This feature was included so that a client will be able to see other clients that are online so that they will choose who to send a message to since one cannot send a message to clients that are offline. A message or a picture is only sent to online clients.

Message Broadcasting – This feature allows one client to send a message to every other client that is online at the same time!

Message Unicasting – The message unicasting feature allows two clients to have a 1 on 1 private chat and only those 2 clients will see those messages that they are sending to each other.

Image Unicasting - This feature allows 2 clients to share images privately and only those two clients will be able to see those shared images..

Image Broadcasting – Image Broadcasting allows a client to send an image to all other online clients at once.

Audio Unicasting – Allows a client to send an audio file to another client and only those two parties will be able to see the shared audio file.

Message Multicasting – Allows a client to send a message only to selected clients and not any other unselected client.

Server Query to a client whether they want to receive a particular file from another client – This feature is included to allow a client to confirm whether they want to receive a file from another client and this file could either be an image or audio file. This feature is added so to avoid a client receiving unwanted files.

Username and Password LogOn – Allows a client to gain access to the chat application.

Chat App exit – This feature allows a client to exit the chat application whenever the client wants to exit.

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Protocol Design

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1. Introduction

The purpose of this protocol is to support the transmission of data from one host to the other. The data could either be a text or a file. The protocol thus supports communication between two or more entities over the network. Clients can be able to communicate from the same host or they can communicate from different hosts with different IP addresses given that they know the IP of the server host.

2. The communication Model

This protocol follows a client-server pattern of communication where one party - either a client or server, starts the communication and the other responds. Each client will communicate with another client via the server. The protocol supports unicast, multicast and broadcast. Where in unicast it’s a one to one communication between two clients via the server, in multicast a client transmits data to two or more clients at the same time and in broadcast a client transmits data to all the other clients via the server. This is a text based protocol.

3. Communication Steps/Procedures

The protocol is text-orientated therefore all messages are human readable character strings.

To set up the communication link:

- The Server initiates the connection by creating a socket.
- Client issues a text or file transfer request.
- The server responds with an available port and the client connects.
- The client can now communicate with the server and other clients.

Every Action done by a client is monitored by the server for example when a client sends a message, exists or join the chat or when clients want to do a private chat.

A client can be able to exit the chat and is able to join again.

4. Message Description

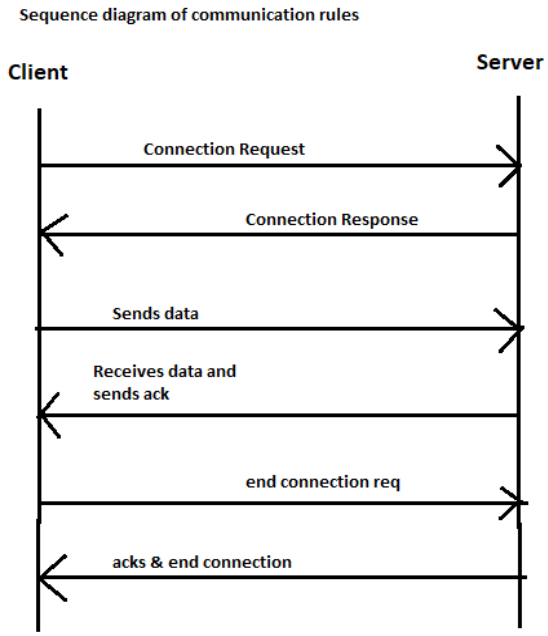
Clients can send connection requests to the server.

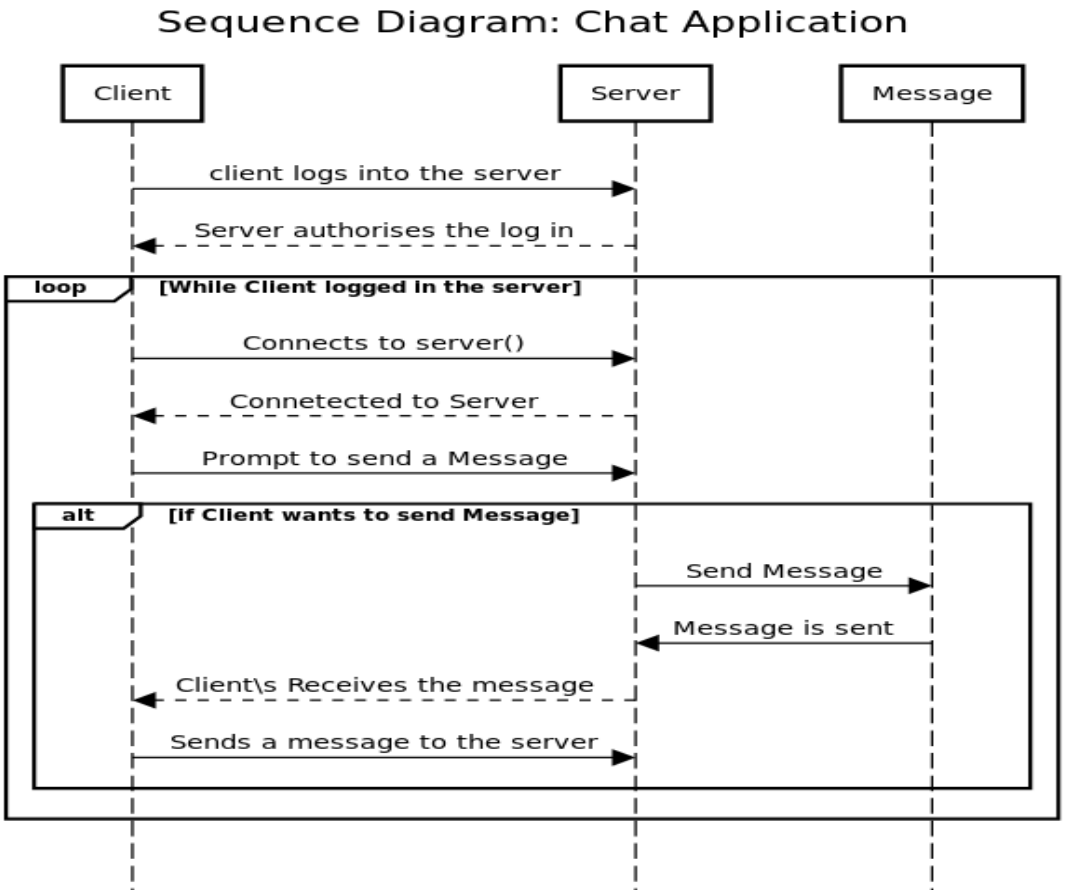
Clients can send any type of messages to each other.

Clients can send image and audio files to each other.

Clients cannot directly send text messages to the server.

5. Sequence of commands and replies





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End of Protocol Design

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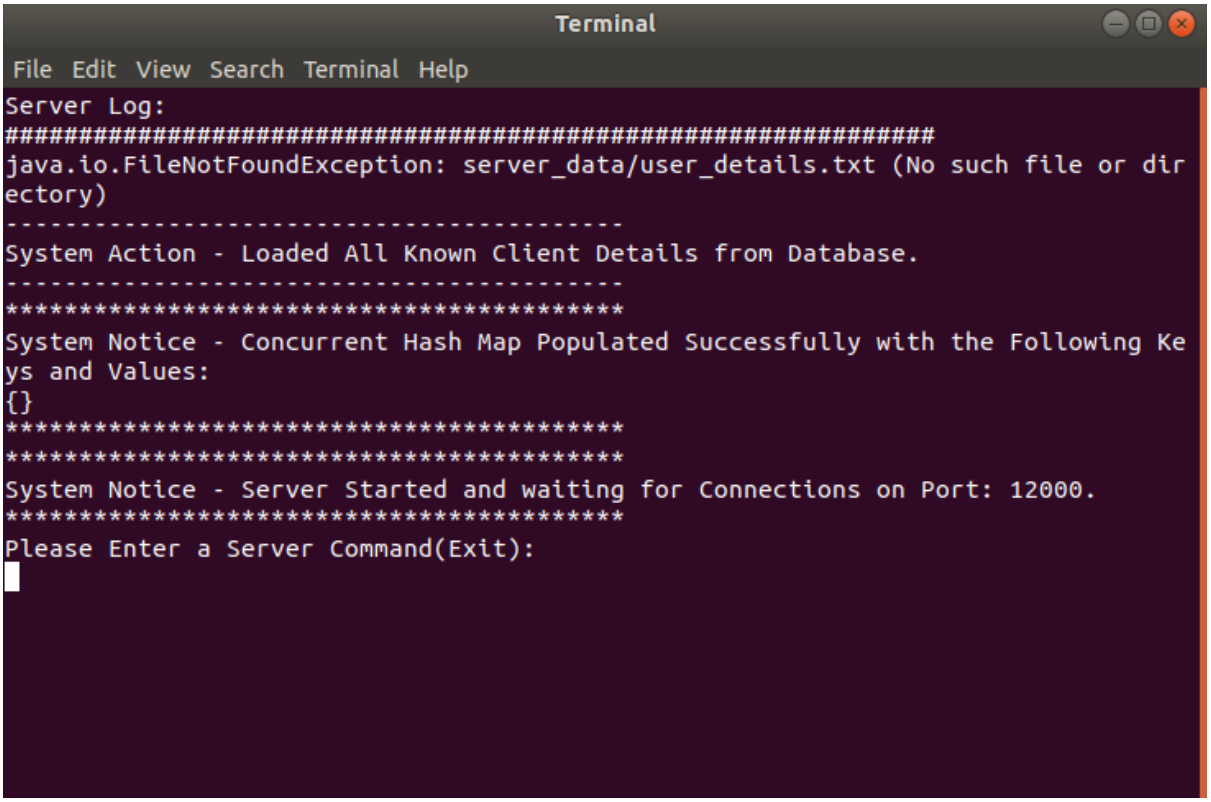
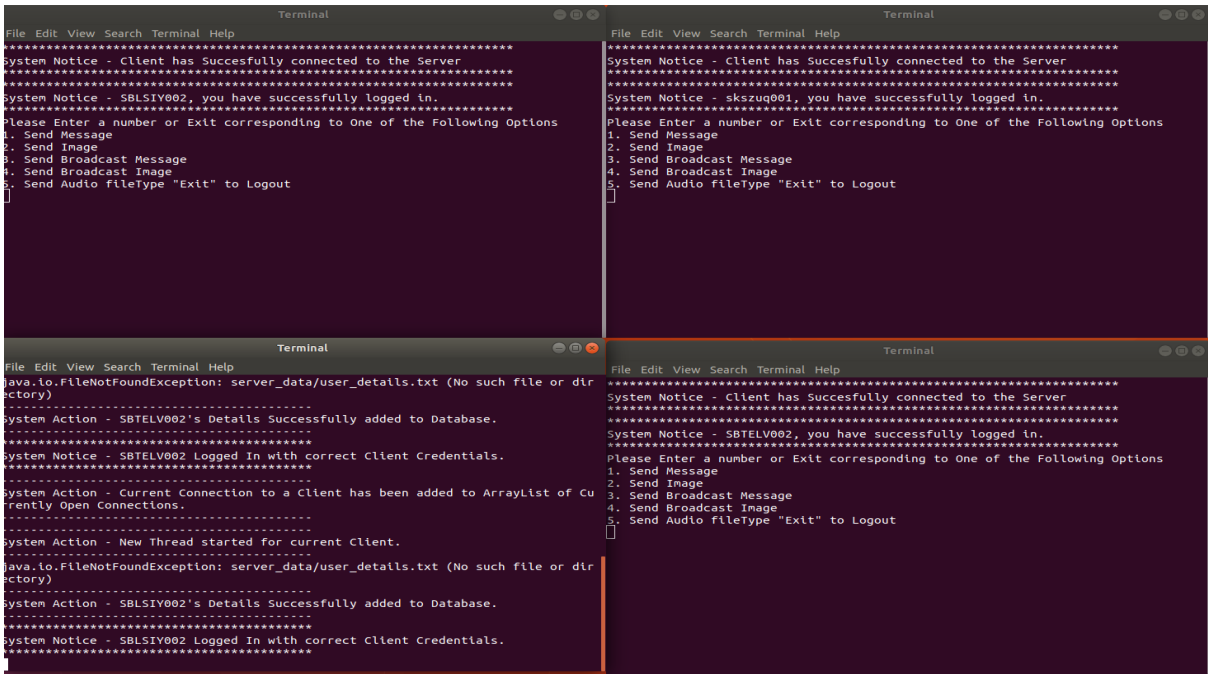
Screenshots of the chat Application

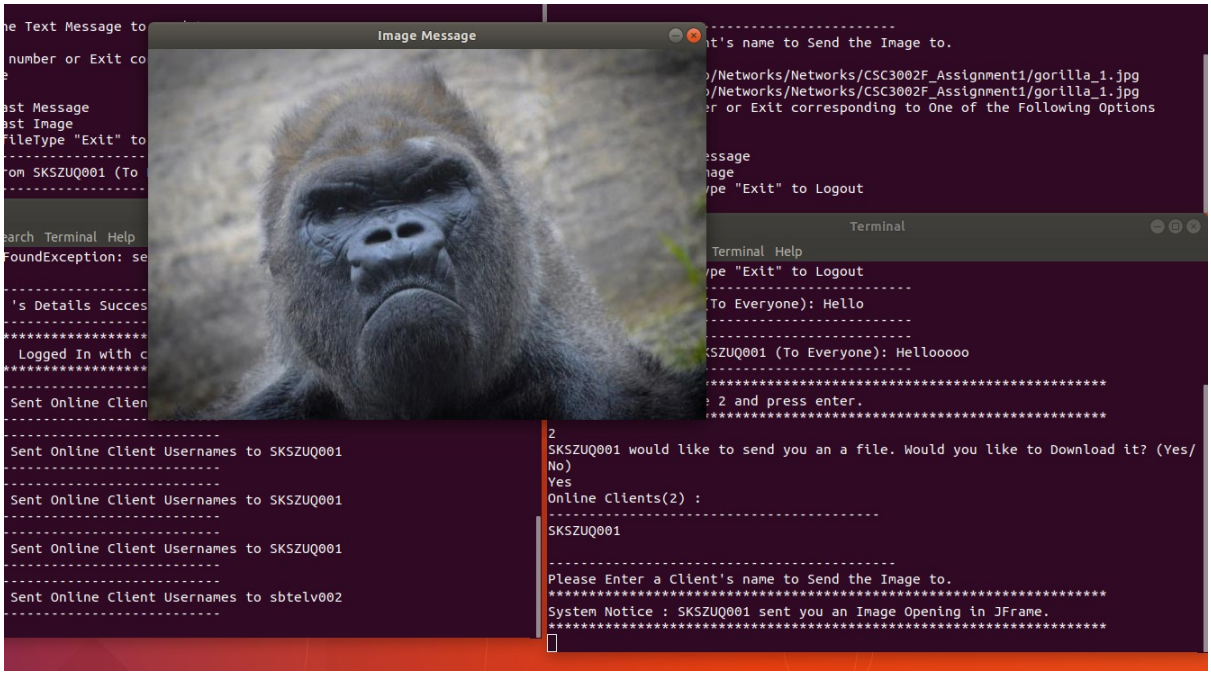
The picture below shows the Server after connecting.



The picture below shows clients connected and server.



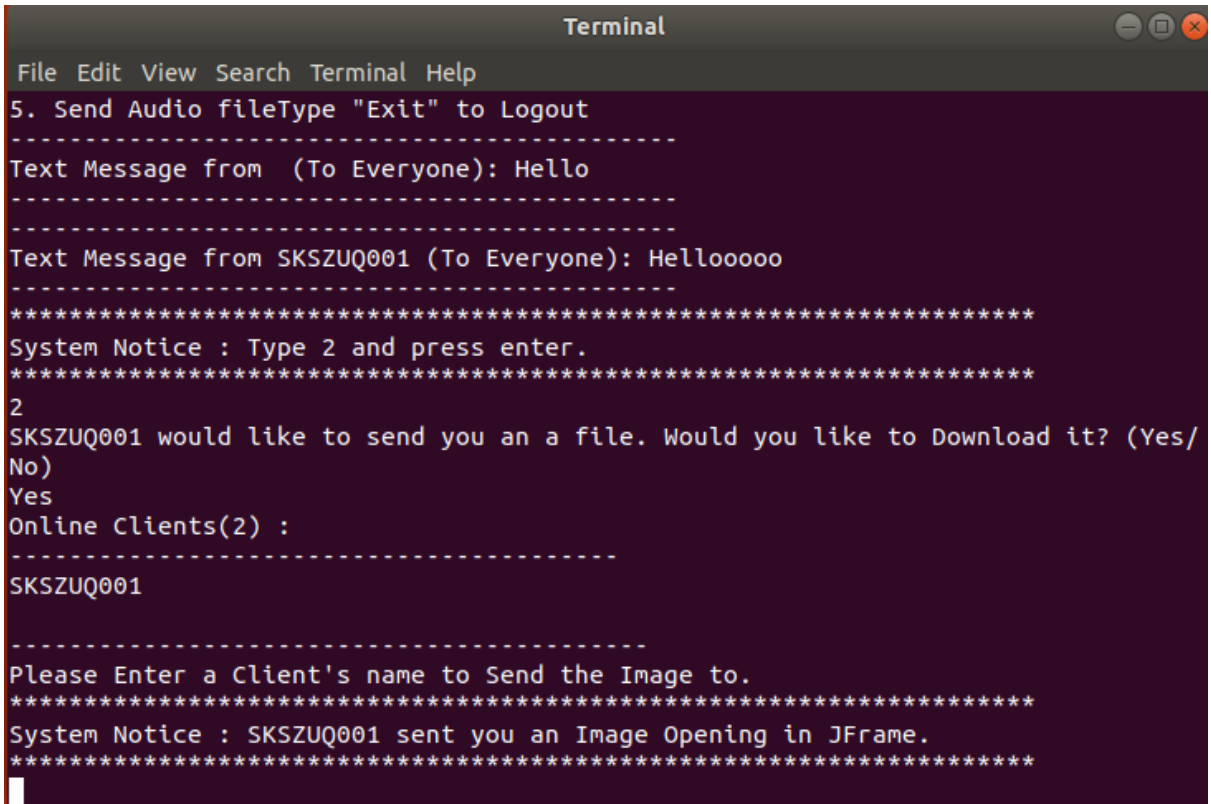
The picture below shows client sending picture to another client, This can send very huge pictures/files it does not online send

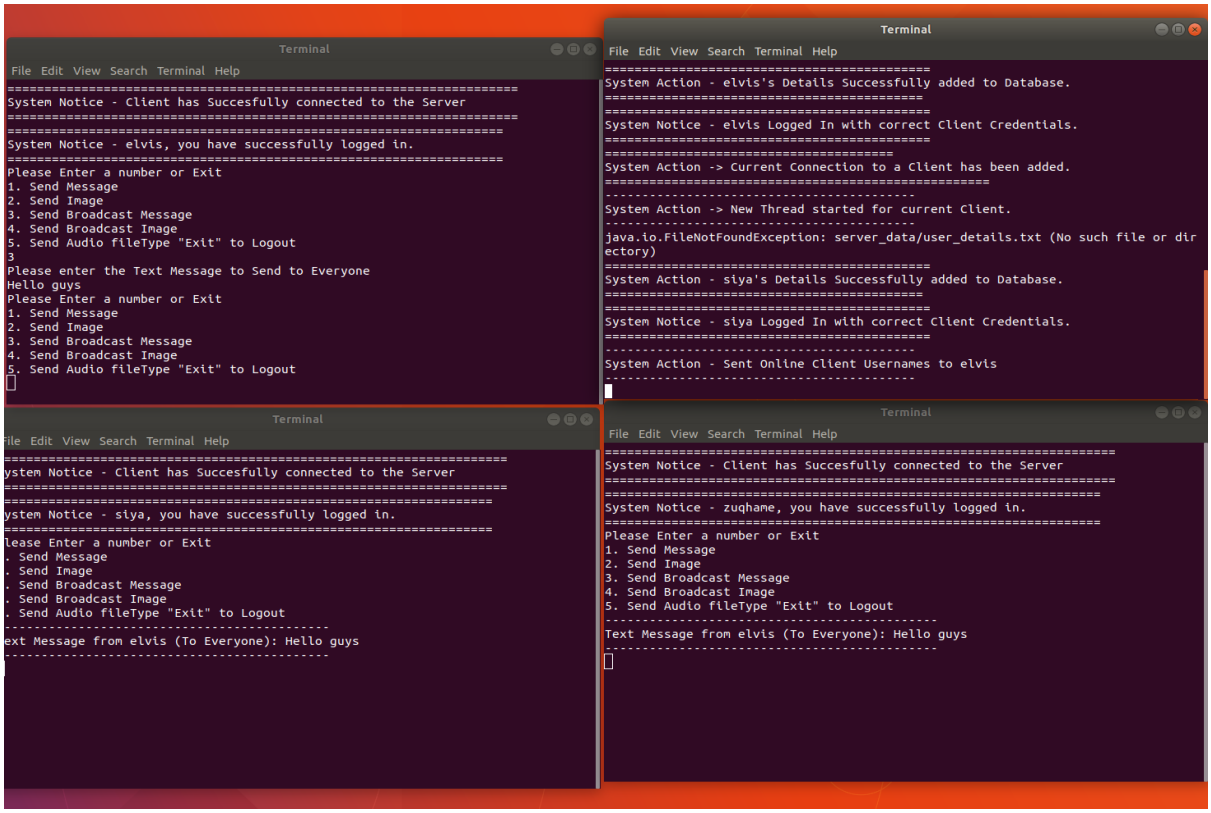


small files.

The picture below is an illustration of how the feature asking whether to download or receive the file works. It also shows number of online clients.

The picture below shows a message sent by one client to all clients connected.





The picture below shows a picture sent by one client to all connected clients.

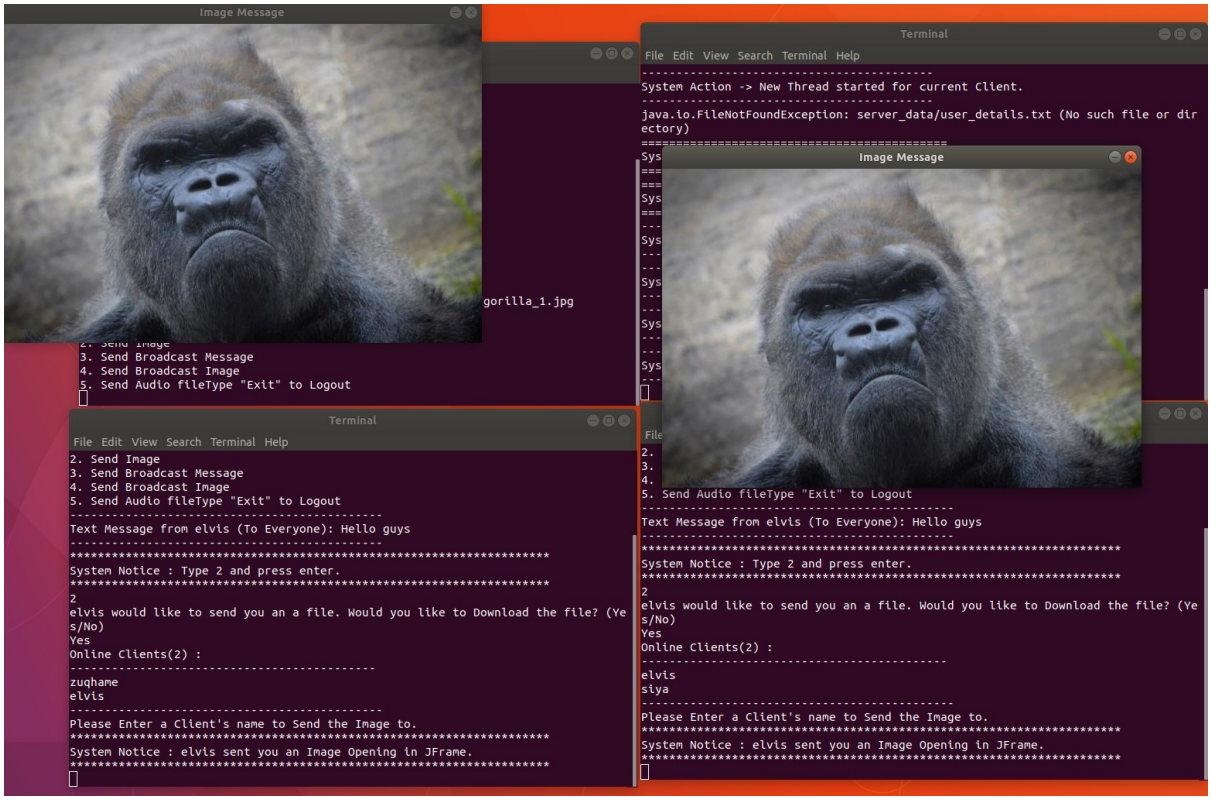


Image Message
gorilla_1.jpg
3. Send Broadcast Message
4. Send Broadcast Image
5. Send Audio fileType "Exit" to Logout
Terminal
File Edit View Search Terminal Help
2. Send Image
3. Send Broadcast Message
4. Send Broadcast Image
5. Send Audio fileType "Exit" to Logout
Text Message from elvis (To Everyone): Hello guys
System Notice : Type 2 and press enter.
2
elvis would like to send you an a file. Would you like to Download the file? (Yes/No)
Yes
Online Clients(2) :
zuqhame
elvis
Please Enter a Client's name to Send the Image to.
System Notice : elvis sent you an Image Opening in JFrame.
Terminal
File Edit View Search Terminal Help
System Action -> New Thread started for current Client.
java.io.FileNotFoundException: server_data/user_details.txt (No such file or directory)
Image Message
5. Send Audio fileType "Exit" to Logout
Text Message from elvis (To Everyone): Hello guys
System Notice : Type 2 and press enter.
2
elvis would like to send you an a file. Would you like to Download the file? (Yes/No)
Yes
Online Clients(2) :
elvis
siya
Please Enter a Client's name to Send the Image to.
System Notice : elvis sent you an Image Opening in JFrame.