# *MULTI-THREADED FILE TRANSFER AND CHAT APPLICATION(In Java)*

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***Abstract*—This paper puts forward the implementation of multiple client-single server file transfer ,peer to peer chat with unicast and broadcast facilities with user protection through socket programming with java gui which offers zero cost communication among staffs in a company or students of college etc,who are having local area network(LAN) connection.The information exchange between individual becomes smoother and provides more options..It is standalone application using JAVA programming as the programming language.**

***Keywords—peer to peer ,socket , LAN, Chat, Messenger, Client Server,voice video.***

## I. INTRODUCTION

The relatively amorphous nature of synchronous messaging allows it to potentially support many different types of communication.It could boost business activities, save time,energy and cost in some cases, it also takes place in different forms such as speech, text, signals and the likes. It can also be said to be a conceptual way of exchanging information between entities.

The despite of uprising growth, popularity and advancement in communication technology which many organizations are using today, some of them still lags behind i.e. they still have not gotten the basic use of Instant Messaging service among Staffs. The communication still conducted with the conventional way which the staffs communicate with each other by walking to the office of the colleague they intend to communicate with. They do similarly or call using mobile phones when they need information from a colleague, which is stressful and/or costly. Also, despite the use of emails for communication, it still has this drawback that if a colleague sends another colleague an email the colleague (recipient) may have to go online to check his/her email before the message can be seen or read. Some staffs do check their mail every two or three days, so if a message is sent, it may take the recipient two to three days to reply because that is when he would be able to access or check his mail. Therefore, with the highlighted problem above,our project aim is to give a solution to this setback. This Application will help save time, evaluate work presence and reduce the staff stress.

The computer network is the product of the combination between computer technology and communication technology.

A) Computer network programming :-
It involves writing computer programs that enable processes to communicate with each other across a computer network.
It Is Used To Communicate Between Pair Of Sockets .The endpoint in an inter-process communication is called a socket The data transmission between two sockets is organized by communications protocols .Application Programs Write To And Read From These Sockets. Therefore, Network Programming Is Essentially Socket Programming.

(B) Standard Network Protocols :-
When computers communicate over networks, they send and receive data using specific network protocols.
These protocols ensure that the computers are using the same specifications to address, forward and process data on the network.

The Most Widely Used Network Protocols are :-

Internet Protocol , User Datagram Protocol , Transmission Control Protocol

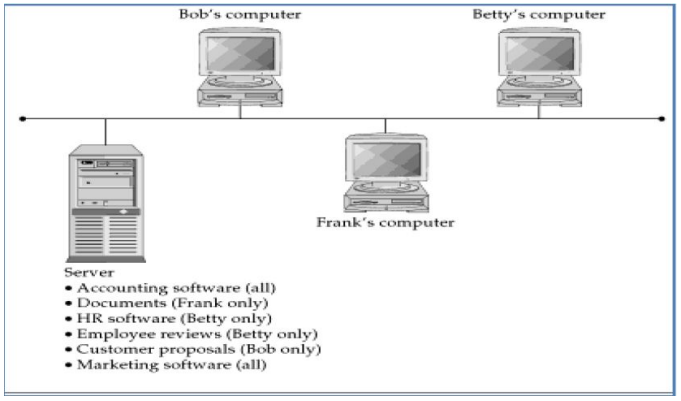
## II. Literature Review

This is a computer program for the widespread online conference.It is considered for an instant messaging build for the use only in a single LAN (Local Area Network) .As a matter of fact there are countless assortments of chatting. The simplest computer chatting is a method of dispatching, consenting, and storing typed memos alongside a web of users. This web might be WAN (Wide Area Network) or LAN (Local Area Network).This study proposed chat system using LAN's (static IP address). It is made up of two requests one runs on the server side (every computer on the web that selects it to be the server) as the supplementary is held and gave on the client side. Every single period the client wants to chat he/she runs the client application.The client must login and then enter port number and IP address of the server, while the server application started.

### (A)Client/Server Mode

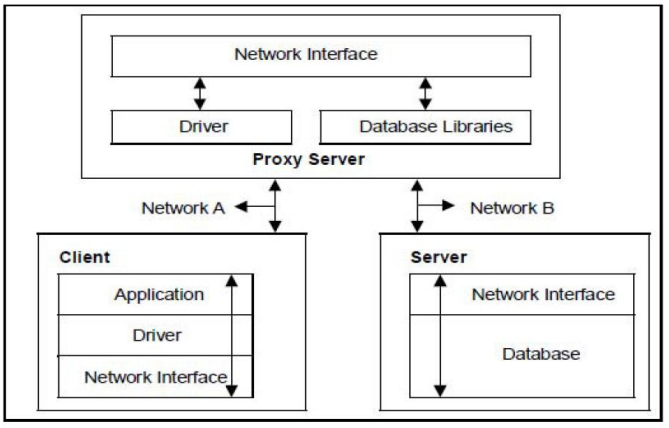
C/S mode is an information sharing mode which is used widely in information system . The core of C/S system structure is distribution of task- level application between client and server.

It provides the terminal client with very friendly interface, for example, Microsoft Windows and so on. The server provides the client with a group of users sharing the service program. The database server is the most common one. It makes many clients share the same access to sources of information.




### (B) Client/Server System Structure

The main task which supports these softwares (communication software and operating system) is to provide a basic structure for distributed applications. The core of C/S system structure is distribution of tasklevel application between client and server. The below figure gives out the mode's the general situation. The basis of exchange is communication software between client and server. The example of this kind software is TCP/IP.




### (C) Connection-oriented service -

Connection is a combination which two of peer entities to conduct data communication. There must be connection establishment before connection-oriented service exchanges data. It will release connection when data transmission is sign-off. There are three steps during data transmission in connection-oriented service: (1) connection establishment (2) data transmission (3) release connection
At present, many of popular network application such as Telnet, FTP, Rlogin and SMTP use TCP.

### 2) Connectionless-oriented service-

Under the connectionless service situation, it is no need to establish connection in advance between two entity communications .The connectionless operate uses datagram protocol. One datagram is a free-running cell, it contains all of the mailing messages. It just delivers datagram simply, which can't avoid the messages of missing, duplicating and disordering. Because holistic source address and destination address must be included in every message, the cost is higher than others. Connectionless operate is fast-speed and efficient, but data security is bad. Datagram is a basic service way, we can use this way if message has no relation with the order of messages arriving.

## IV Proposed Methodology and working

We like to propose a method in this paper using Connection-oriented Multiple client-server Model with Multithreaded socket programming and the reason is simple, we don't want only a single client to connect to server at a particular time but many clients simultaneously. We want our architecture to support multiple clients at the same time. For this reason, we must use threads on server side so that whenever a client request comes, a separate thread can be assigned for handling each request.

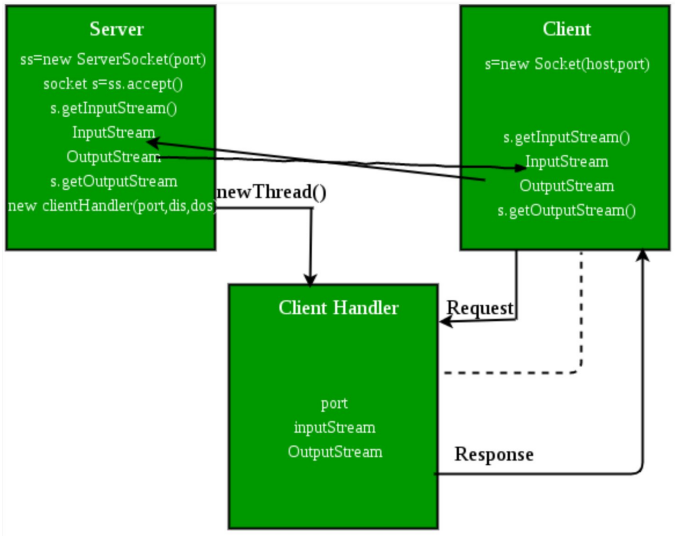



Fig 4.1 Explaining Multiple Client requests Handling

The server runs an infinte loop to keep accepting incoming requests ,when a request comes ,it assigns a new thread to handle the communication port,the server also stores the client name in to a vector,to keep track of connected devices.The vector stores the thread object corresponding to the current request .A class uses the vector to find the name of receipent to which message is to delievered.As this vector holds all the streams,another class can use it successfully deliever messages to specific clients.

In real world, it is not required to send someone a message in order to be able to receive one. A client should readily receive a message whenever it is delivered to it i.e sending and receiving must be **implemented as separate activities rather than sequential**.

(A)Security (login/signup facilities)

We included a Java database XML file which consists of few prefilled login details(Usernames and passwords),so only those users whose credentials are valid will be given access to servers but then we didnt limited to this part,we gave another option called sign up through which the user himself can get registered newly if he wasnt there previously so that his credentials will get added in to the data base .

(B)History(kind of Backup)

We had included an section called History for uploading an XML file which records respective clients each and every transaction history of both chat and File transfer which can be used for future purpose

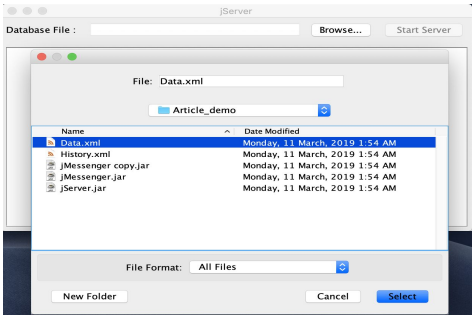
(C)Particular And Group transactions
We included the feature of particular client to get connected with another particular client through which he can chat and send/receive files and also each client can message to all the active clients which makes every client to chat with each other clients at a time(kind of group chat)

(D) Working of both chat and File Transfer

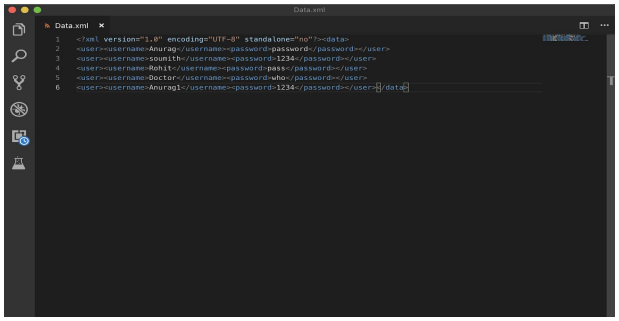
Initially while hosting the server we should include the data file of login credentials after which IP and PORT NUM will be displayed on servers UI ,with which the clients who want to get connected to this server with their valid credentials after entering should login or else they can use sign up option and then we should include History file in the respective section of servers UI which records all the transactions which connects you to the server .
we mapped the client IDs to usernames so that all the active clients list will be visible to rest of them which enables them in selecting their mates with their usernames for specific chat ,file transfer or else they can chat with all active clients at a time .
For file transfer we included an option in which files path is to be browsed,when a particular client is selected ,he will be receiving a confirmation dialogue box which was designed using Java Swing library after which the file starts transfering and the sent client will get acknowledgement message that the sent file has been received by the other client.

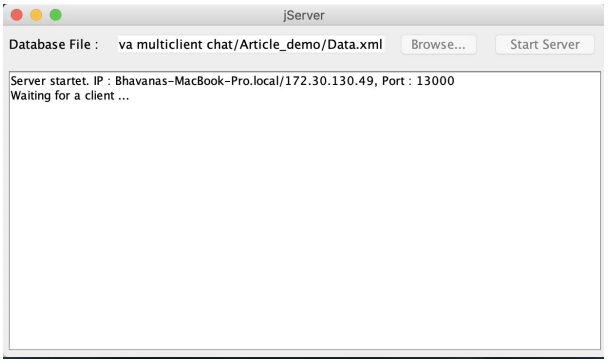
HOST ADDRESS AS IN SERVER

V . IMPLEMENTATION :

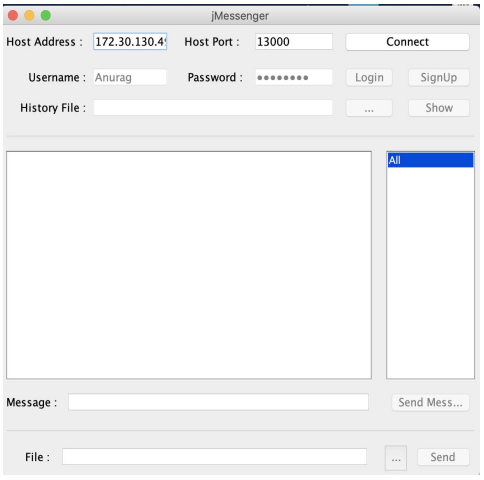



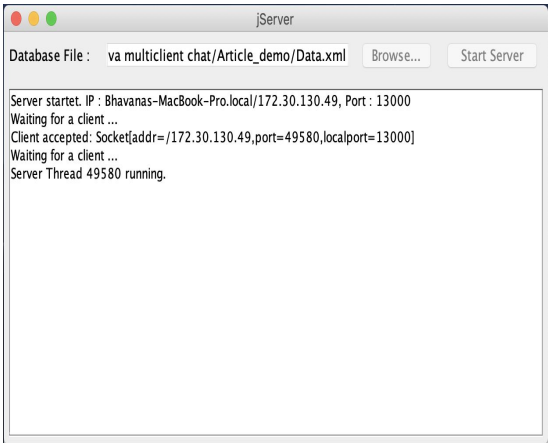

- INITIALIZING SERVER



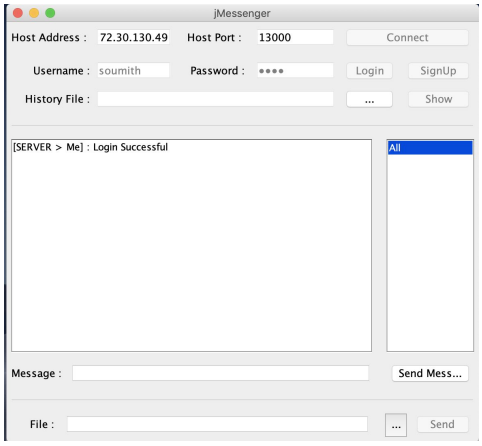



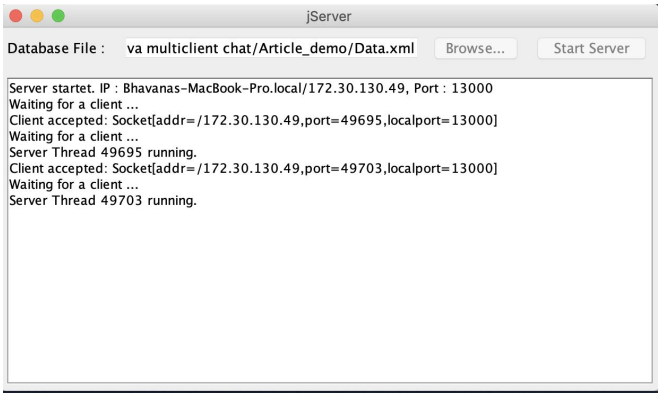

- CONTENTS OF DATA.XML



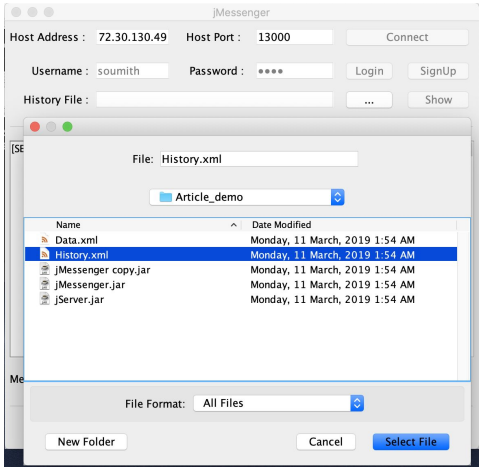



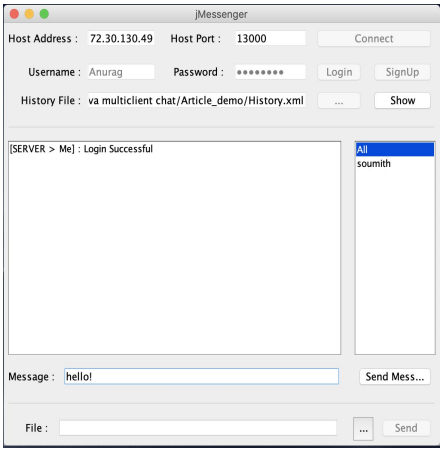

- INITIALIZING SAME PORT NUMBER AND



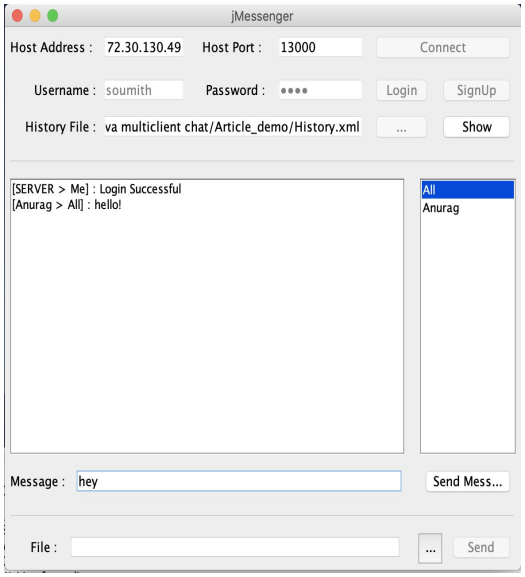

- CLIENT 1

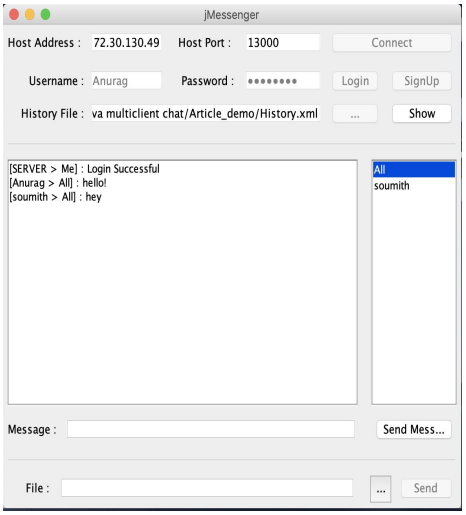


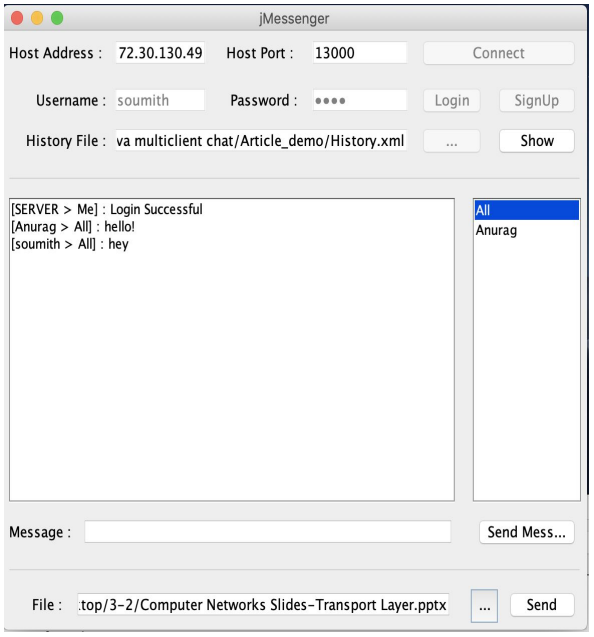

- CLIENT 2

- MAINTAINING CHAT DATABASE IN HISTORY FILE



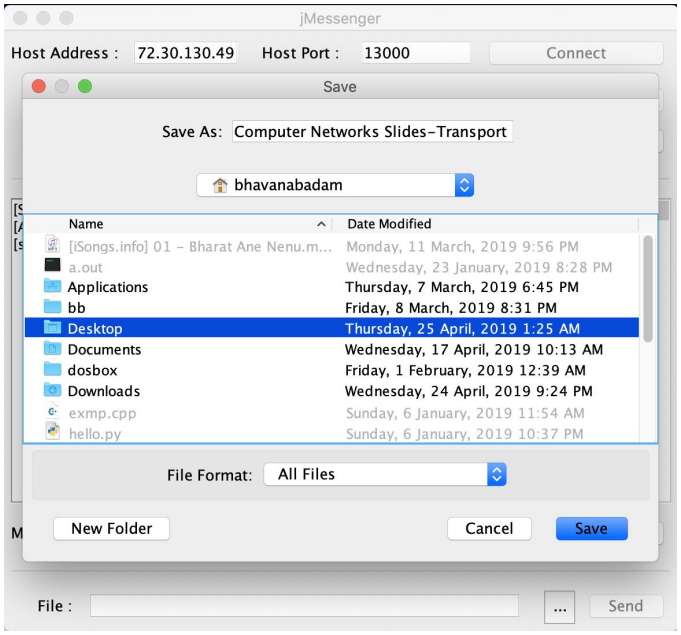



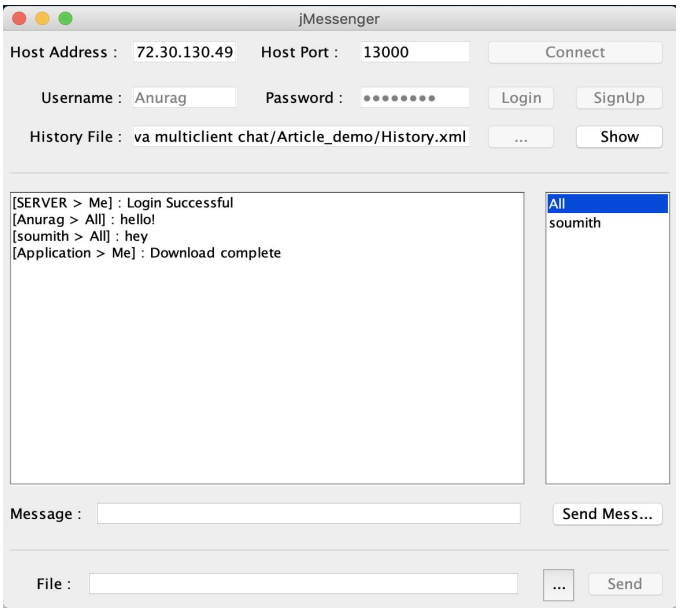

- MESSAGE TRANSFER

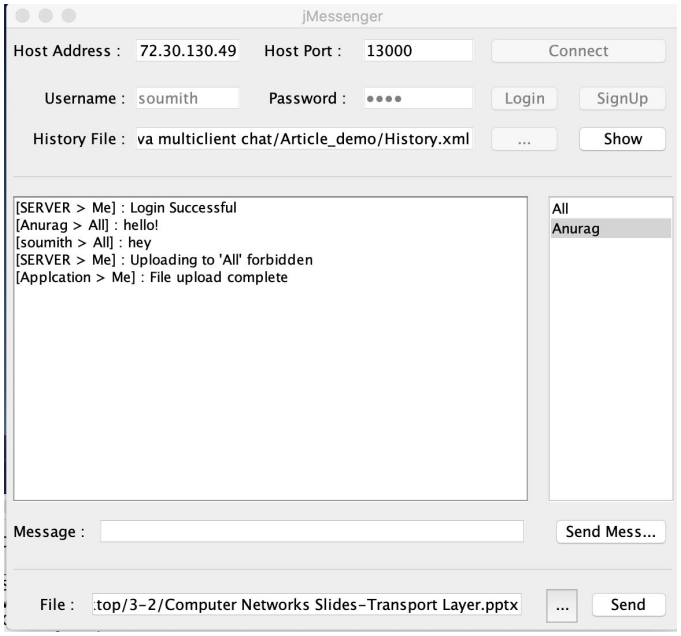


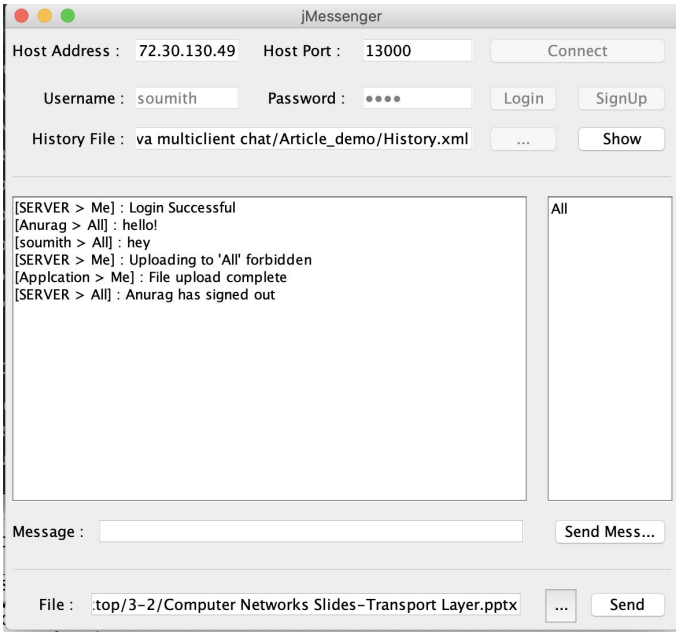


- FILE TRANSFER

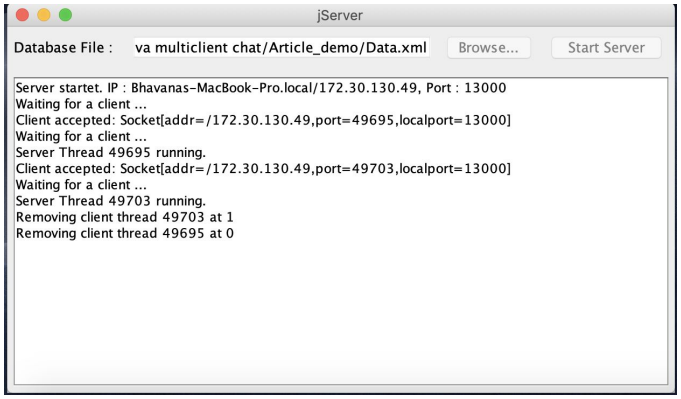



- SIGN OUT MESSAGE




## VI Limitations

1)Chat History is not complete. The project's main purpose was to demonstrate networking concepts and due to deadline limitation it was not completed.

2)Many people are confused why chat over different networks is not possible. To understand this, take the example of any web-server. For any browser to connect to a web-server, this server needs to have a global IP address so that it is visible on the *Internet*. Similarly jServer also is a application server and for chat over two different networks (say a campus LAN and DSL at your house), it also need to be run on a computer with a global IP address.

3)File transfer size and speed are limited to certain extent to which we are unable to find solutions due to time limitation.

4)We faced some simple issue in registering new entries to Data Base file

## VII Extensions

1)We can add voice over lan feature which makes lot of advantages to big network companies so that the employees can have voice conversation with free of cost and also it cannot be misused as it is limited to that particular network.

2)End to End Encryption can be implemented so that the clients privacy can be protected from the servers side.

3)Customized Group chat can be added which will be the extension of our present over all Group chat which makes the clients to create their own Group to start the conversation.

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