Distributed Chat Room

By -

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PROBLEM STATEMENT

The aim is to create a distributed chat facility which would be able to implement the system to handle multiples clients(users) into the chat room . The order of messages received by the users in the chat has to be same. Also additional facilities for the admin to handle the group joining requests is to be implemented.User must also be able to join or leave a group as per user's wish.

Technologies Used :

Language used : Java

System Pre-requisites : The system must contain Java Environment and MySQL database installed.

Protocol used : Java RMI for RPC.

Functionalities Developed :

1) Create a group as admin

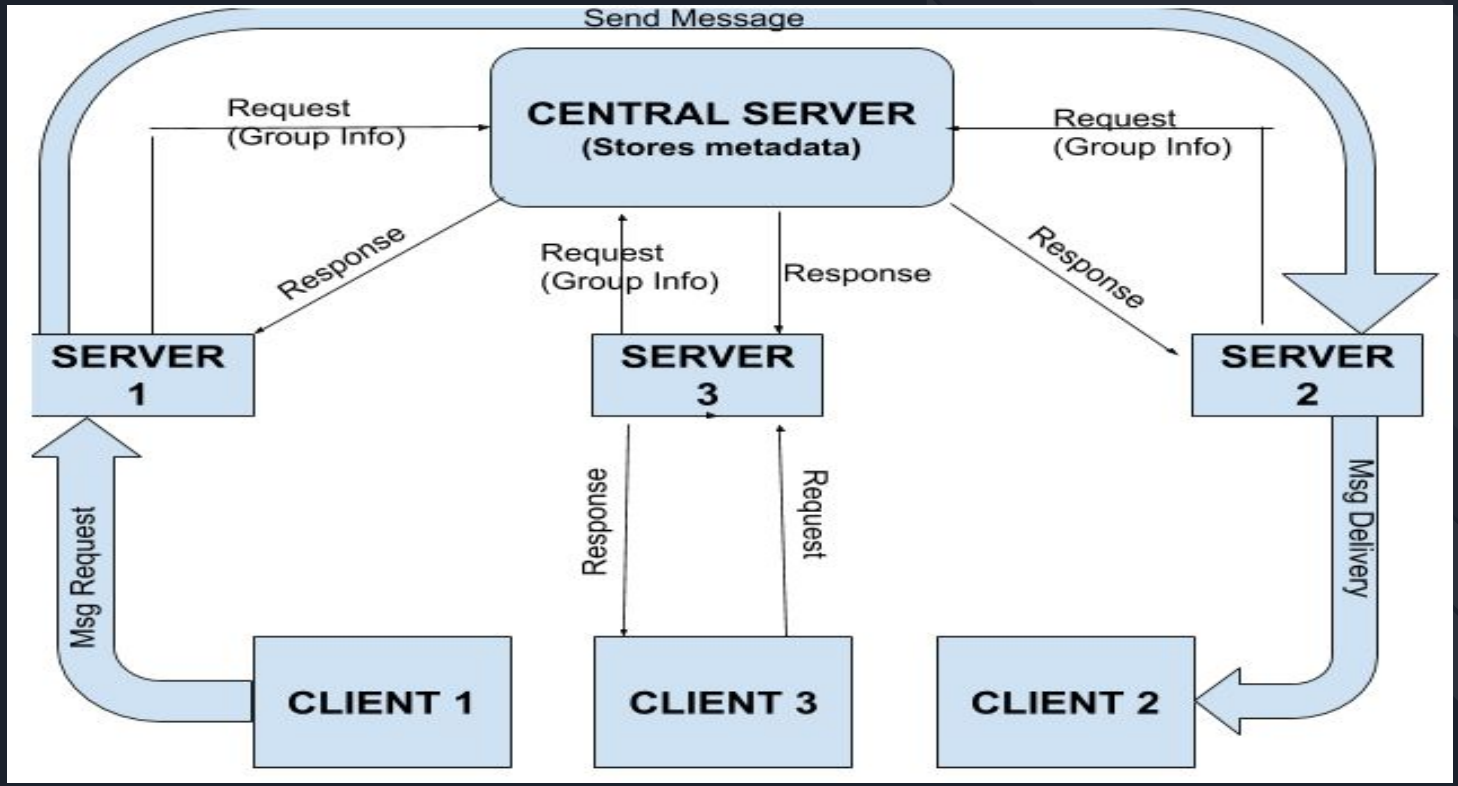
2) Join / Leave a group

3) One to One chat facility

4) Group chat facility

5) As an Admin, Reject/Accept request by user to join group.

Architectural Design



Architectural Design

The architecture consists of the following components :

- Main server
- Side Server
- Client

Main Server

The main server contains the meta data . It has the information of which side server handles which client.The Main Server is responsible to implement the overall execution of the distributed chat facility , it is the job of main server to connect the clients(users) to the side servers which eventually connects to the main server to exchange the messages.

Side Server

The side servers acts as a intermediates between the client and the main server . Each side server is one to one connected to the clients and helps the main server to identify each client by coordinating the messages given by the clients in group chat system.Also order of messages is maintained by main server using the side servers to update their clients message box each time a user sends any message

Client

The client takes care of the message sending and receiving utilities by the user . One client per user maintains chat record of the user and coordinates with the side server to connect to the group chat implemented by the main server

MySQL Database

The database stores the information regarding the person and the groups the person in present in , also admin details are stored .
Database consists of three tables :

Table Info

Table Persongroup

Table Requests

Table info

This table consists of the usernames and passwords of the people to login to the system developed.

Info	
id	password

Table Persongroup

It consists of the group details, it has name of the group , the persons present in the group and also the information of admin of the group

Persongroup		
group name	person	admin

Table Requests

The requests keeps tracks of the requests made by a user to enter a particular group , it has user id and the group name requested for

Working :

The client first requests the main server which assigns a side server to the client , thus the main server contains the information of each client and its group and also the one to one mapping of the side server to client .

The overall message order and the sending and receiving of the messages is handled by the main server.

Each client is further handled by the respective server and thus all are coordinated to successfully implement the group chat feature by the main server.

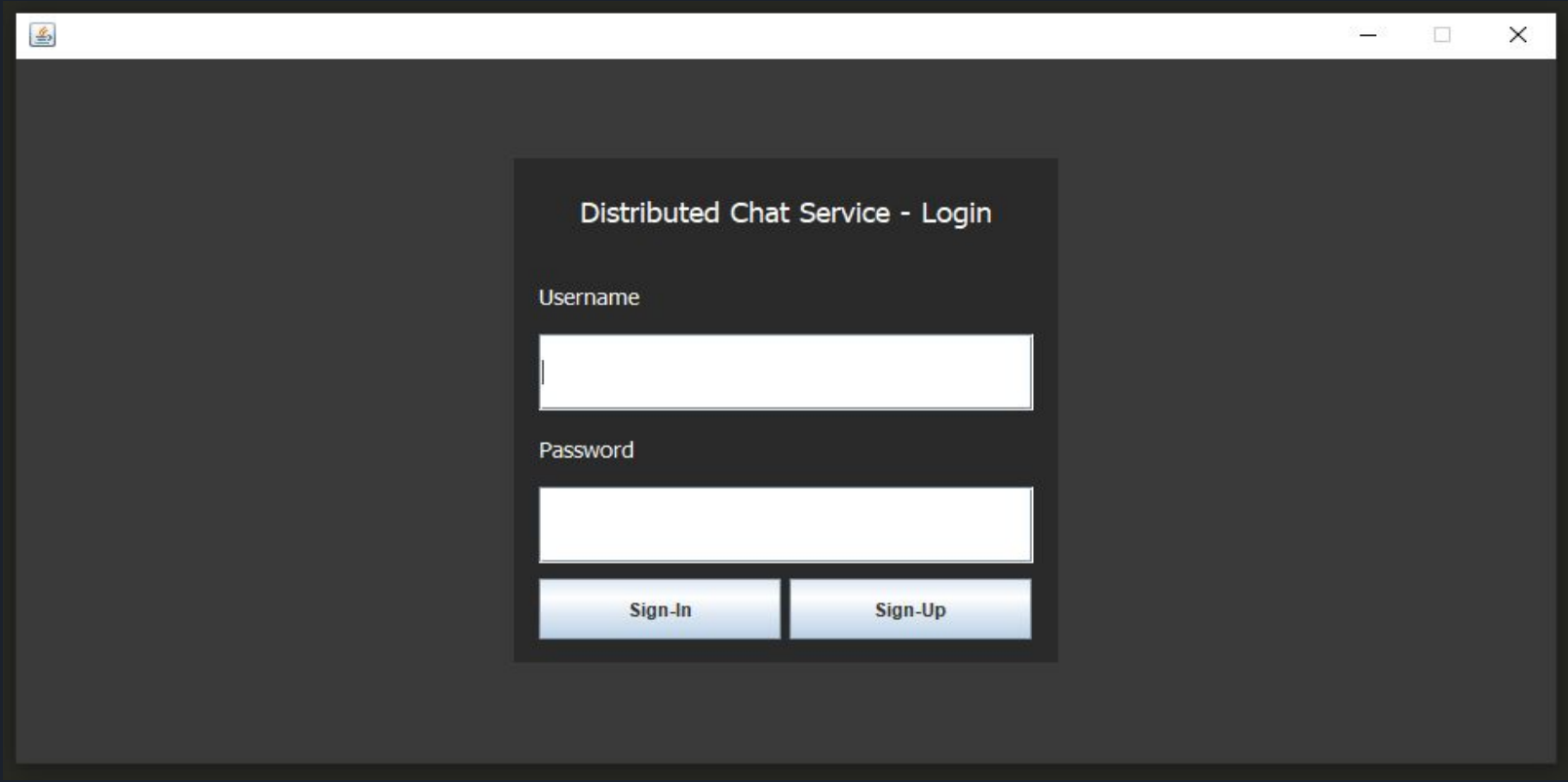
One to one chat feature

one to one chat is implemented as a special case of group chat with 2 users , the client sends messages to the assigned side server which takes the message to the main server , the main server sends the messages to the side server of the client to which message has to be sent. Finally the side server sends the message to the assigned client .

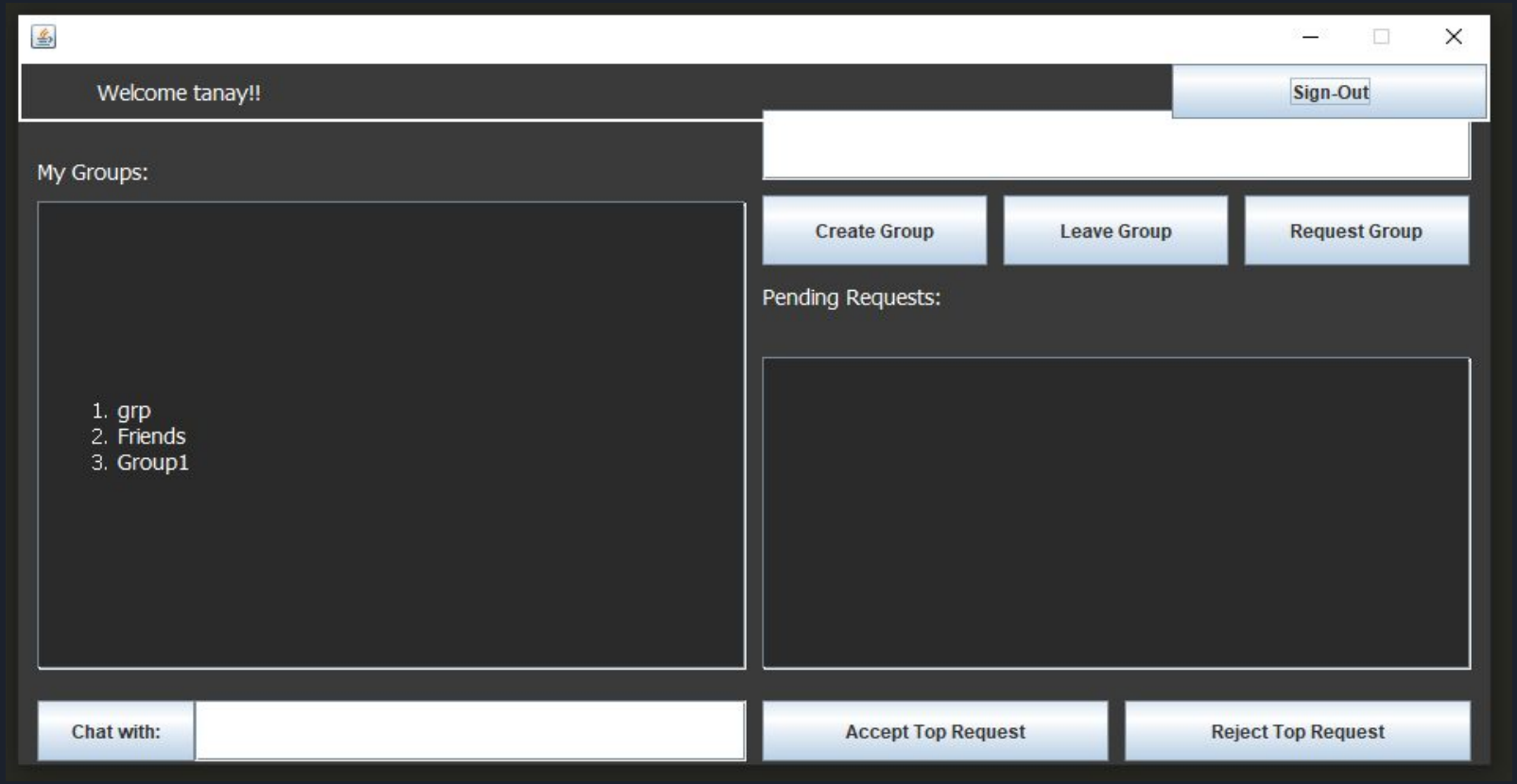
Group chat and Message ordering

To implement the group chat multiple servers are one to one connected to the main server by the process discussed earlier . At each point a user sends a message in a group chat and the messages is delivered to the main server by the respective side server , the main server sends the messages to each client in the group through the respective side servers.Also , to maintain the order of messages has been timestamped with the first server contact(using server's time) to ensure the same order to all clients.

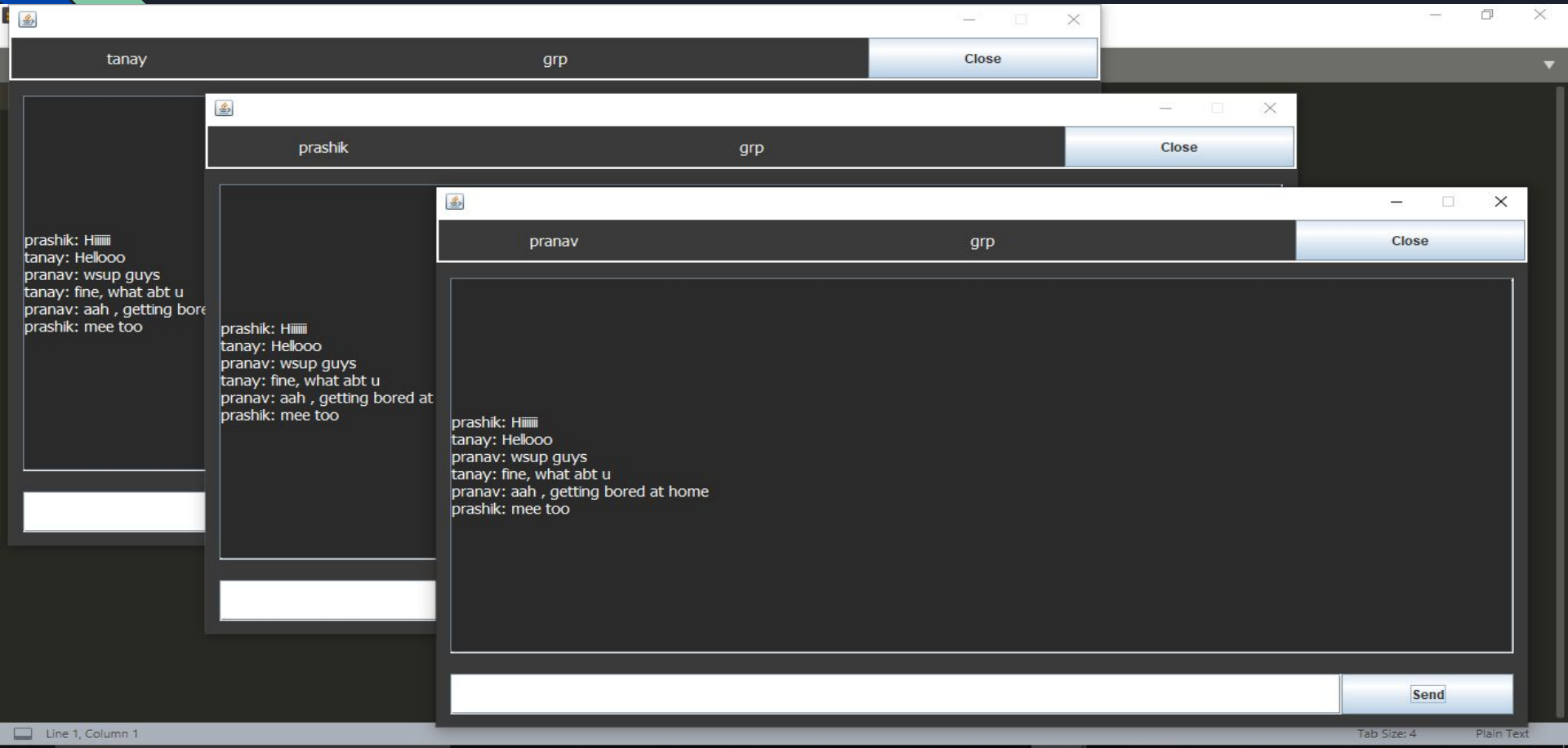
Java GUI for Distributed Chat Room : Login Screen



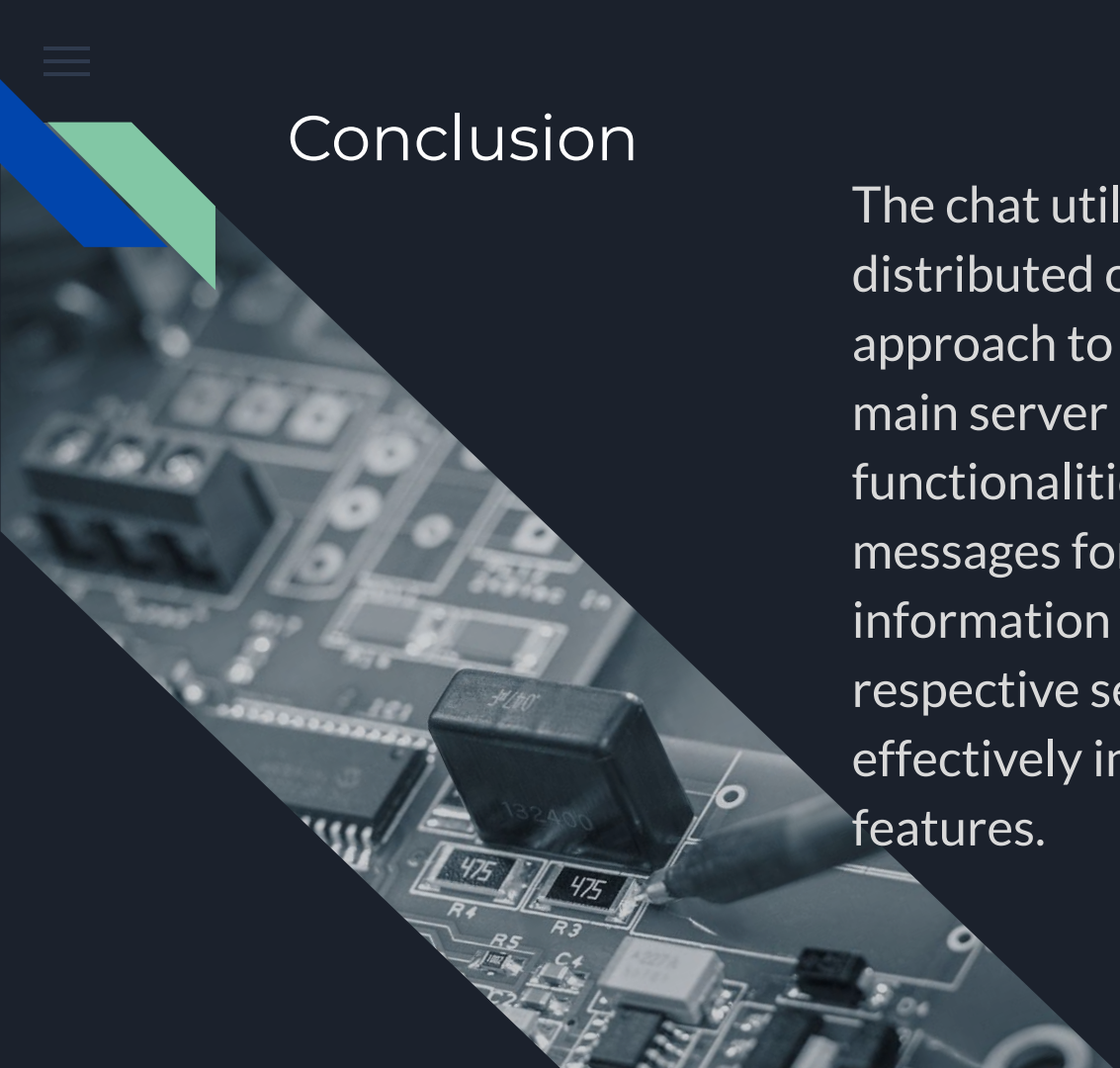
Java GUI for Distributed Chat Room : Home Screen



Java GUI for Distributed Chat Room : Group Chat screen



Conclusion



The chat utility developed uses the distributed one to one server client approach to implement group chat .The main server handles important functionalities such as similar order of messages for each user and contains information of each client , its groups and respective servers.Thus, the architecture effectively implements the distributed chat features.

Scope

The developed system is able to implement basic one to one and group chat facility. Still a lot of work can be done to improve the scalability of the developed project , handling a lot of users needs improvement. Also, security improvements can be introduced as users privacy needs to be maintained . Video and audio messages can be added.

Thank You