Distributed Chat Server

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1. INTRODUCTION

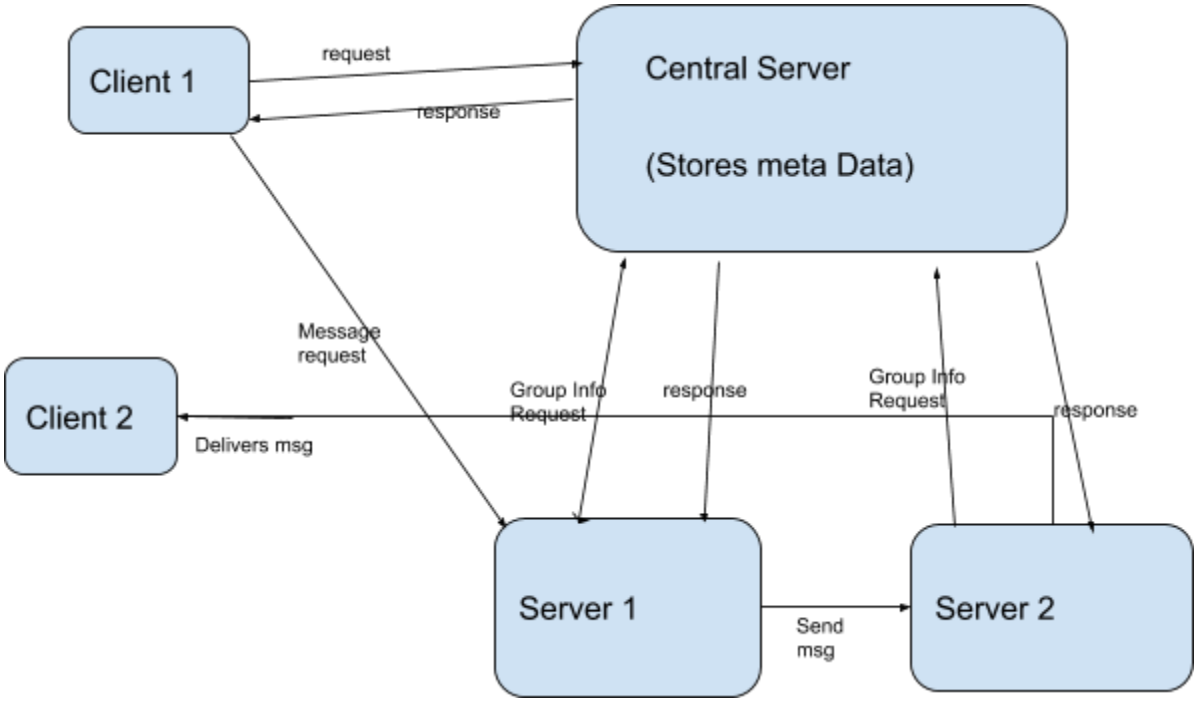
1.1 Purpose

In this project we have tried to implement a chat system in which users can enter and create a chat room or join any existing chat room. The chat rooms will be distributed and will allow the users to create chat rooms where multiple users can enter and communicate with each other. The fact that this application is distributed allows us to scale up the application so that many users can use the same chat room to communicate with each other and scroll through messages in realtime.

1.1 Overview

In this document we present the details about various modules used in the implementation of distributed chat system. We also mention the architecture of the system and the technologies used in the implementation.

2. ARCHITECTURE



As we have shown in the architecture, we have a main server which stores the information that which client belongs to which server. Firstly, the client hits the central server and which then redirects the client to a server and stores the fact that the client has been redirected to the server. Central server also stores the information that which client belongs to which group.

One to One Communication

Consider one to one communication, for example, between Client1 and Client2 where we are sending message from Client1 to Client2.
Client1 sends a request to the server, and the server sends the request further to the main server and the main server replies with the information

that which server the Client2 belongs to. After Server1 (Client1's server) knows that which server the message has to be sent, the message is sent to the destined server which then is delivered to Client2.
One to One communication in our case is a special case of group messaging where the group size is 2.

Group Messaging

As mentioned that the central server stores all the information about groups i.e. which client belong to which group. Moreover the information about which client belongs to which server is also stored in Central server.
When a client sends a message in a group, the server requests the central server to send the list of members of the group and then the message is delivered to the destined server which further get delivered to the respective clients.

Ordering of Messages

Our aim was to ensure correct ordering of messages, i.e. every user should be able to view messages in the same order even though some messages may arrive later than others due to network delays. So to ensure this ordering we timestamp all the messages send by its users with its first server contact(and using the server's time) and this ensures that a particular message wherever it is will have the same time and hence the same ordering.

3. TECHNOLOGY

Languages used:- Java
Protocol used:- Java RMI for RPC

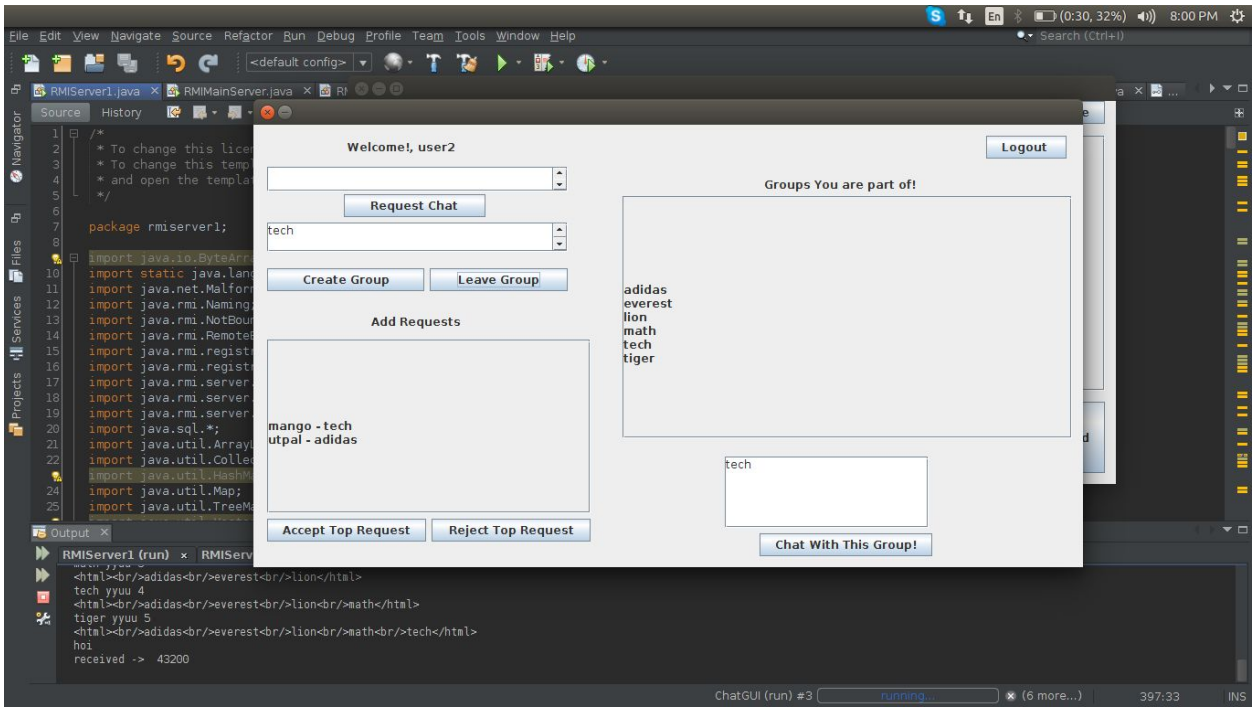
4. FUNCTIONALITY

1. **One to one messaging.**
2. **One to channel(chatroom) messaging.**
3. **Creating a chatroom.**
4. **Viewing messages(chat) in order.**
5. **Entering/Leaving Chat Rooms.**
6. **Allowing Audio Chat**

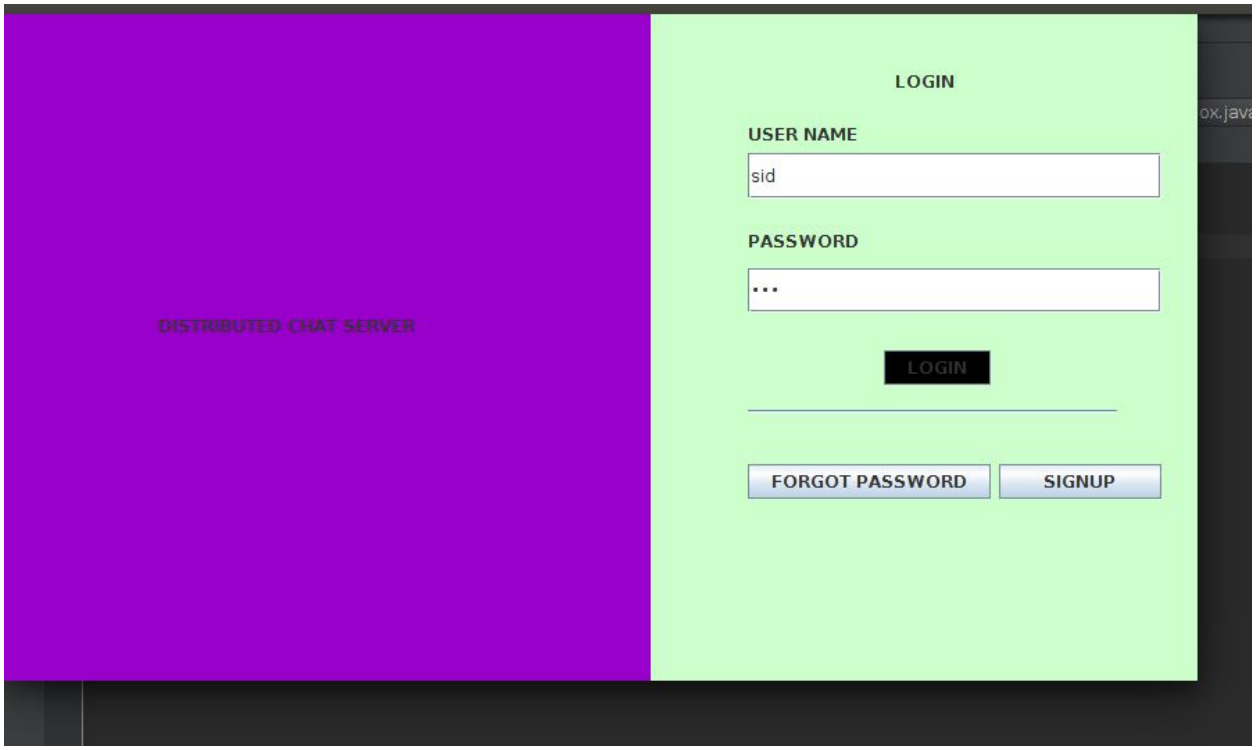
5. Scope

Through this project have implemented a distributed chat server whose chats will be distributed. Here in this project we have provided the users with an interface where they can enter or leave a chatroom of their choice. And after they enter a chatroom they can chat with the group members of the chat room where they can send and view messages in real-time. The interface also allows the users to create their own chat-room where they can chat with people who choose to join the chat-room they've created. The interface also allows the users do a one-on-one chat which means they can do a personal chat with a user of their choice.We have implemented a voice chat also.
The project can be extended to allow the users to do video calls with each other and also do group video calls. System can be made more secure and scalable too. Scalability comes into play when millions of users are trying to use the system simultaneously.

Pictures



After logging in


DISTRIBUTED CHAT SERVER
LOGIN
USER NAME
sid
PASSWORD
LOGIN
FORGOT PASSWORD
SIGNUP

Login Page