Project 2 – Systems and Networks II

Overview

The project uses the knowledge of C language network programming under Linux in which you need to develop an online chat room. The chat room project simulates the functions of today's chat tools, enabling the most basic functions of sending messages to each other, group messaging, login registration and more.

Problem Description

You are asked to implement a program for creating an online chat room. For this project, you will need to utilize the concepts of network programming related knowledge, using the basic framework of Server/Client implementation. The list of requirements and constraints for the system are as follows:

1. Adopt Client/Server architecture. The project should consist of two parts: the client and the server. The client and the server are directly connected. Both components play an important role. The client is not only capable of input and output. It can handle some business logic transactions such as calculation and data storage. The server mainly deals with transaction logic. The server needs to constantly monitor whether there is a new client that needs to connect. If there is a new client to connect, accept the client's connection; if it is a request from another existing client, perform the chat room related functions. The client needs to connect with the server, first enters the account login registration process. After the login is successful, it needs to be able to accept the information sent by the server in real time and can use various other functions of the chat room.

2. Before logging in to the chat server, the client needs to register ID and password. You need to use a database to store information such as IDs and passwords. When registering, it is necessary to judge whether the account already exists and compare it with the account number in the account database one by one. If the same account exists, it indicates that the account already exists.
3. After the registration is successful, the client can log in to the chat server with its own ID and password. During the login process, when the ID is entered, it is determined whether the account has been logged in, and whether it exists. After the password is entered, the information of the corresponding location of the database is compared, and the password is determined to be right or wrong. After the login is successful, the login ID information is sent to the server.
4. Multiple clients can log in to the chat server at the same time and chat with other users. The server needs to support multiple clients to log in at the same time. These clients can work normally at the same time. The client can receive information from the server and the clients can communicate with each other.
5. After the client successfully logs in, user can view the number of online users in the current chat room.

6. The client can choose to send a message to a specific client, that is, the "private chat" function. Select this function at the client, enter the ID of the sending object, then enter the information and send it. The server determines that if it is a private chat request, the information is forwarded to the user corresponding to the ID.
7. The client can choose to send a message to all online users, that is, the "group chat" function. Select this function at the client, then enter the information and send it. The server determines if it is a group chat request and forwards the information to all users who are online currently.
8. Users can choose to view group chat records or view personal chats records.
9. File transfer. The client can select the file transfer function, first enter the ID of the transfer destination, and then enter the file name to be transferred. The receiving end of the file will receive the file receiving request information, select yes or no to accept or reject the transmission.
10. Change the password. The client can choose to change the password function and change the password corresponding to the user ID stored in the database.
11. Logout. The client can choose logout function , the server responds to the operation and logs off the login of the client.
12. Server has a special permission account 'admin' for managing chat rooms. Admin can: 1). ban a member; 2). dismiss a member; 3). kick a member out of the chat room. Enter the corresponding user ID to complete the corresponding operation.

Grading Breakdown

- **[15 pts]** Working menu system to take in user input and call functionality
- **[10 pts]** Register user to the chatroom and log in the chatroom.
- **[15 pts]** Multiple clients can log in to the chatroom and chat with each other.
- **[2 pts]** A logged in user can see the number of other users who are online at the same time.
- **[15 pts]** Private chat function implement
- **[10 pts]** Group chat function implement
- **[6 pts]** Users can view group chat records and view personal chats records.
- **[6 pts]** File transfer function implement.
- **[4 pts]** Users can change their password.
- **[5 pts]** Users can logout.
- **[6 pts]** Admin can kick a client out of the chat room
- **[6 pts]** Admin ban a member and dismiss a member.

Submission

Points will be deducted for not following these instructions. Before submitting this project in eLearning make sure that you follow

the following steps:

1. Make sure that your name appears at the top of each file. This should be done as a comment for any source code files. Turn your zipped-up project into eLearning.

Sample UI

```
-=|  Online Chat Room  |=-
1. Register
2. Login
0. QUIT

Enter an action: 1
```

```
-=|  MAIN MENU  |=-
1. View current online number
2. Enter the group chat
3. Enter the private chat
4. View chat history
5. File transfer
6. Change the password
7. Logout
8. Administrator
0. Return to the login screen
```

```
-=|  View current online number  |=-
The number of Current Online Users is : 20
```

```
-=|  Group Chat  |=-
Received a group message from (ID): Hello World

Enter the message you want to broadcast: Hello
```

```
-=|  private chat  |=-
Received a private message from (ID):

Who do you want to send the message to:
message:
```

```
-=|  Chat history  |=-
1. Group Chat
2. Private Chat
0. QUIT

Enter an action: 1
```

```
-=|  File transfer  |=-
1. Select the file
2. Select transfer object
0. Quit
Enter an action: 1
```

```
At the receiver end:
Received a file transfer from (ID), is it received?
y(yes), n(no)
Enter an action:
```

```
-=|  Change the password  |=-
Enter the old password:
Enter a new password:
Re-enter the new password:
```

```
-=|  Administrator  |=-
1. Ban a member
2. Dismiss a member
3. Kick a member out of the chat room

Enter and action:
```

```
-=|  Ban a member  |=-
Enter the ID you want to ban:
```