

VIET NAM NATIONAL UNIVERSITY HO CHI MINH CITY  
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY  
COMPUTER SCIENCE AND ENGINEERING



COMPUTER NETWORK

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# Assignment1: NETWORK COMPUTING

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## 1 Phrase 1

- **Objective:** Build a chat application according to the protocol defined by each group, using the TCP /IP protocol.
- **Functions of the application:** Our application will have below fuctions:
  - Broadcasts message (Server send to all clients).
  - Multicasts message (Server send to some clients).
  - Unicast message (Server send to only one client).
  - P2P chat model: 2 user chat directly to each other.
  - A group P2P: more than 2 users chat together.
- **Chat Protocol** used: all functions are using TCP/IP for implementation.

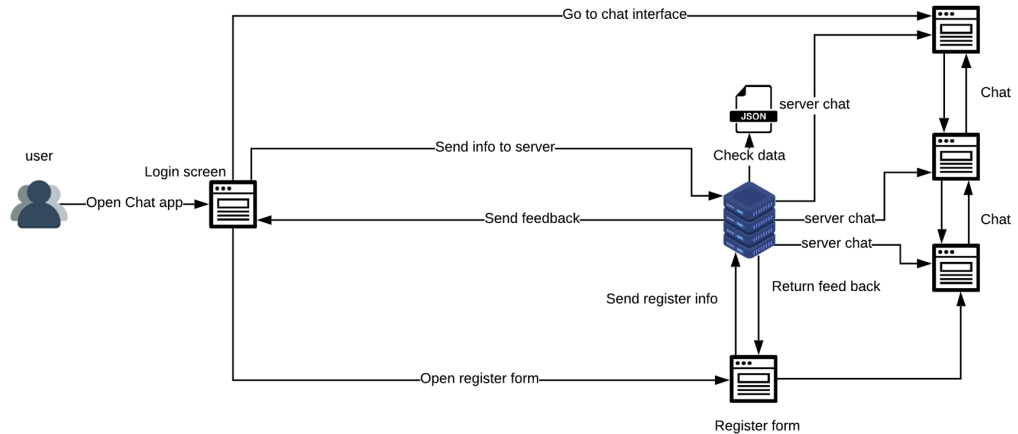
## 2 Phrase 2

### 2.1 Function Specification

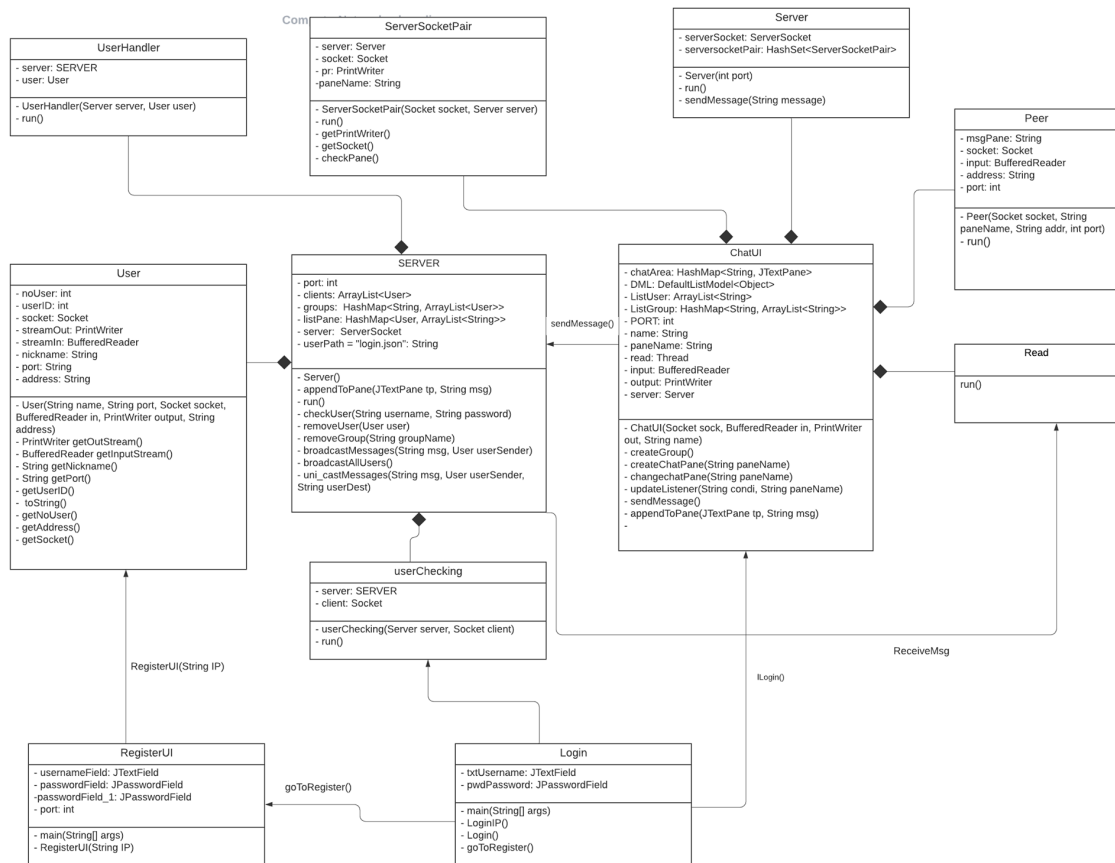
- **Login:**
  - The login screen will let user choose which server to connect to. After the user's input in Username and Password panel, these information will be collected by Server and the Server will check with the login.json in the file directory.
  - In case both information is correct then user will be notified by the "Logged in!" window pops up. Else, either the incorrect username or password or they don't exist the notification window will pop up to let the user know.
- **Register:**
  - In case user choose "Register" in the login UI, the register form will be opened.
  - After filling out the all three text field: username, password and confirm password, this information will be sent to server and server will check with the file login.json.
  - If the password is not the same as the confirm password or the user already exist, error notification will show. Else Server will create a new user and give a port number for this user (every user have different port) and save inside login.json.
  - User will be directed to Chat UI after successful register.
- **Chat all in server:**
  - When first come to the chat menu, user will initially be in the Server tab, which means any message sent in this tab will be broadcast to all Client connected to user.
- **Chat one-to-one: P2P:**
  - If user click on a name on the user list, the System will create a peer to peer connection for them to chat with each other.
  - After user sends the message, the message will be delivered to the server inside the Client app.
  - After receive and identify that this is a message, the message will be collected by the PrintWriter of the serversocketPair that connected to it and show in the chat panel of both users.
- **Group chat:**
  - If user want to chat in group of more than 2 people, first they need to click the Create Group button. This will create a window for them to choose who they want to chat with.
  - If the group chat creation has no error, it will show up in the user list of all user contained in group and by clicking it, user can now chat with their desired group. Otherwise, a notification will show up to show the error.
  - The process of sending message in group chat is similar to the one to one chat, the message will be collected and then received by PrintWriter in each serversocketPair that connected to group and then printed on these Chat Panels.
- **Private chat:**
  - If you want to send message to a specific people, you can start your message with @username message and the message will be sent to this username.
  - Example "@dung,phong: hello", the "hello" message will only show up in dung, phong and user Server Chat Panel.

## 2.2 Detailed application design

*Architecture:*

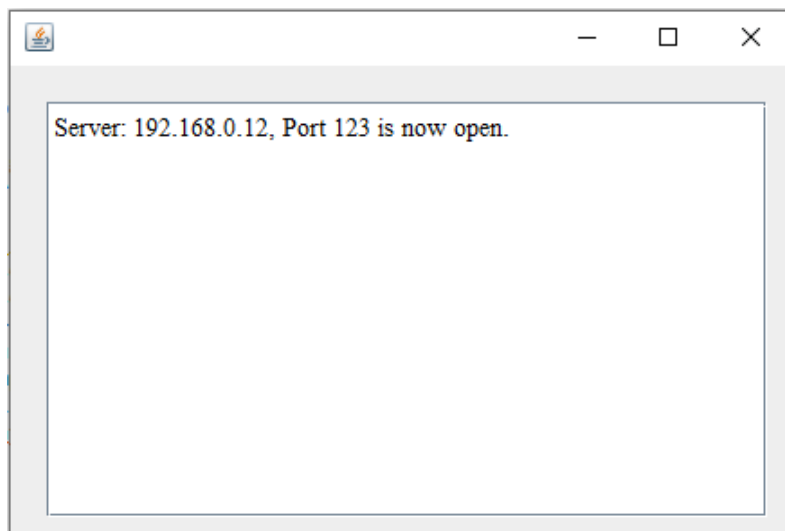


*Class diagram:*

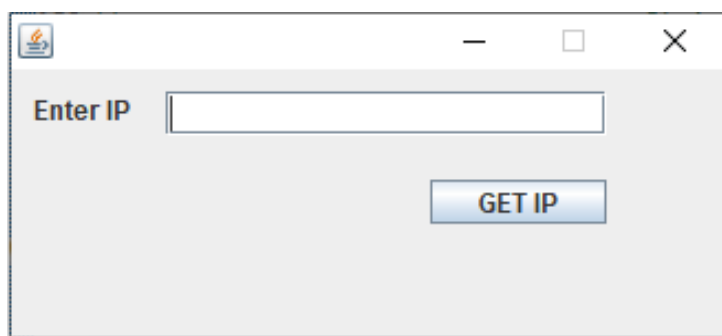


## 2.3 Assessment of actual result

- Server Start

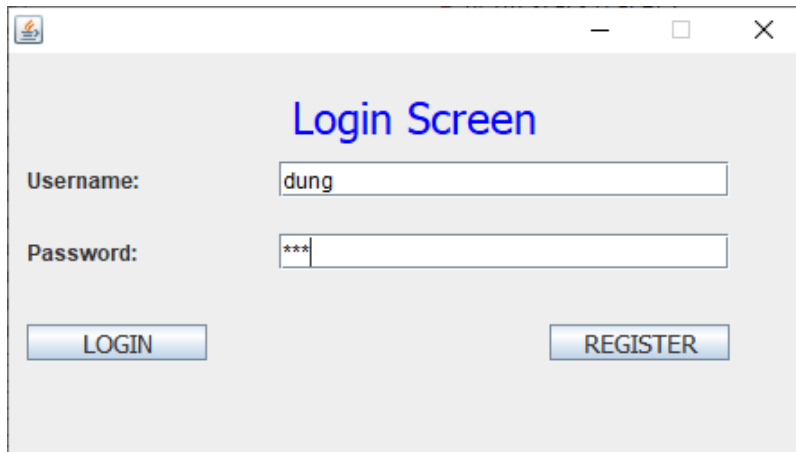


- Ip input



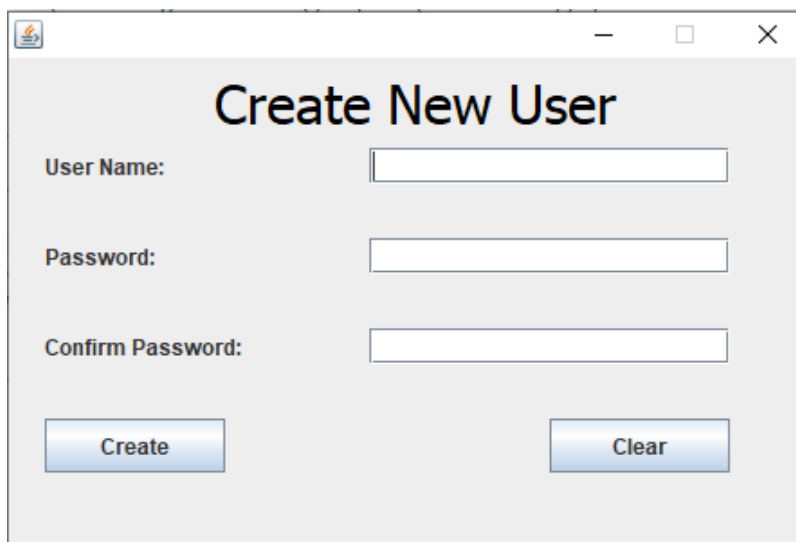


- Login screen



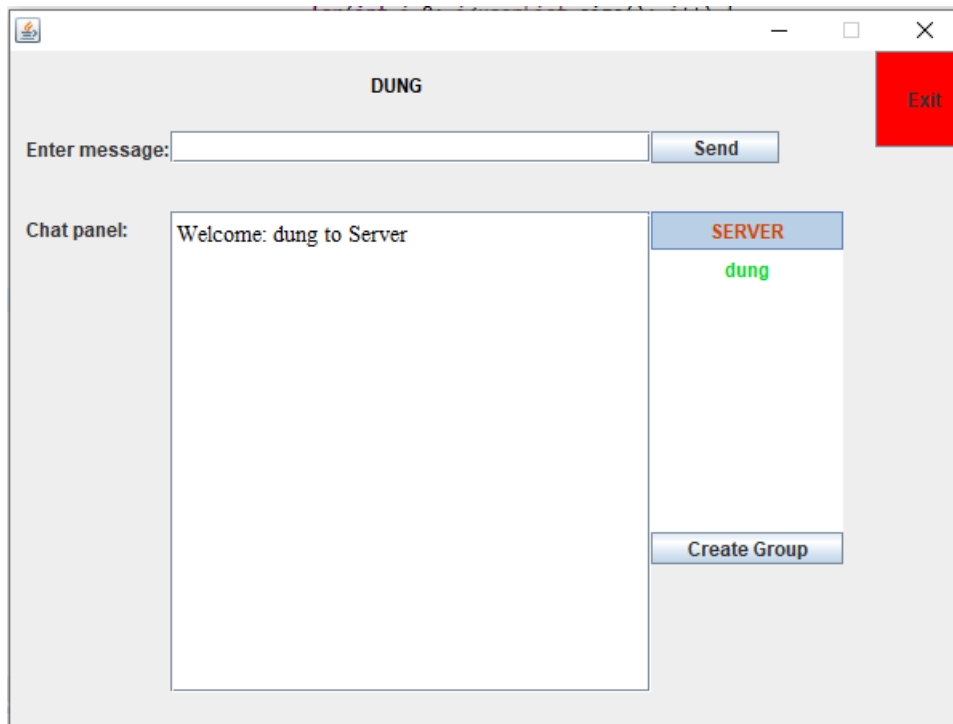
A screenshot of a Windows-style application window titled "Login Screen". The window has a standard title bar with minimize, maximize, and close buttons. The main content area has a light gray background. At the top center, the title "Login Screen" is displayed in blue. Below the title, there are two input fields. The first is labeled "Username:" and contains the text "dung". The second is labeled "Password:" and contains three asterisks "\*\*\*". Below these fields, there are two buttons: "LOGIN" on the left and "REGISTER" on the right, both with a blue gradient and white text.

- Register screen

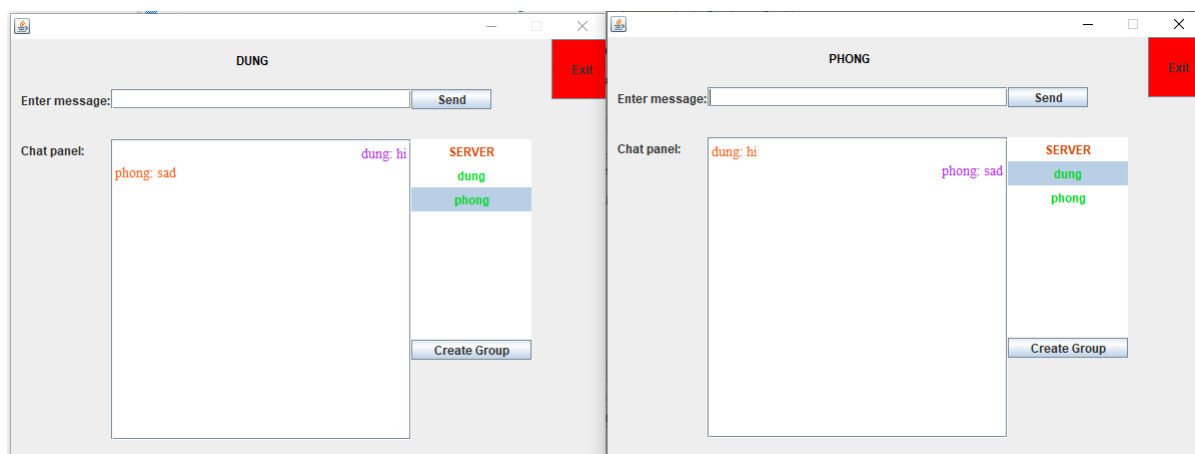


A screenshot of a Windows-style application window titled "Create New User". The window has a standard title bar with minimize, maximize, and close buttons. The main content area has a light gray background. At the top center, the title "Create New User" is displayed in black. Below the title, there are three input fields. The first is labeled "User Name:" and is empty. The second is labeled "Password:" and is empty. The third is labeled "Confirm Password:" and is empty. Below these fields, there are two buttons: "Create" on the left and "Clear" on the right, both with a blue gradient and white text.

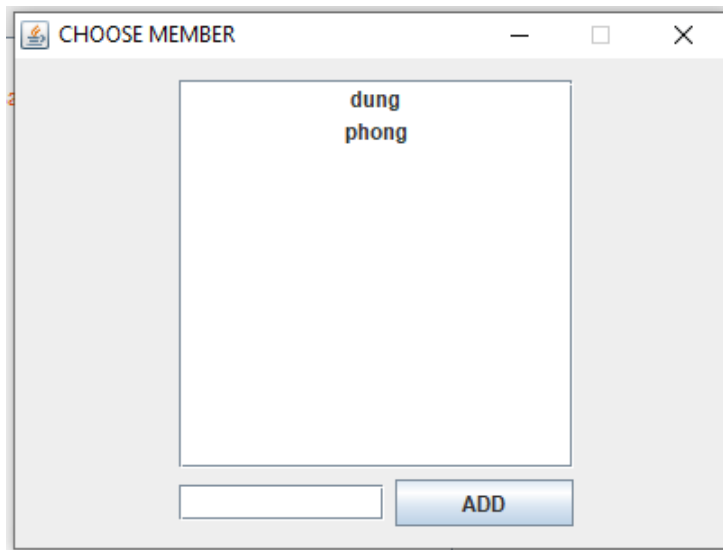
- Chat UI



- Peer to peer chat



- Create group



## 2.4 Manual document

The manual will be included inside the MANUAL.txt file.