Distributed Systems and Computing : Laboration 1

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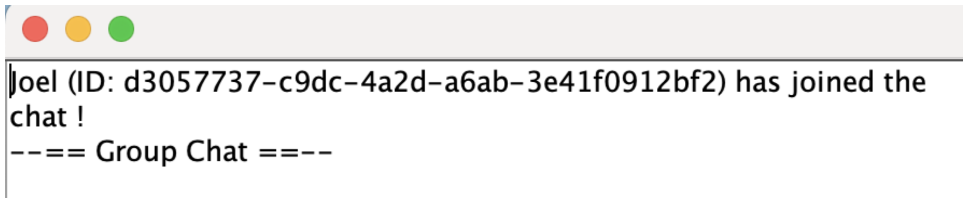
In this first laboration, we want to extend the given skeleton by programming in Java additional functionalities to a chat system in the situation of distributed systems. In order to learn about UDP broadcast sockets, we have several points to follow as a guide in the implementation.

After choosing a unique port to avoid collision with other students' programs, we first want to implement a Join message that should be sent from a client when the client starts and join a group chat. To do this, we follow the same structure as the sending of chat messages :

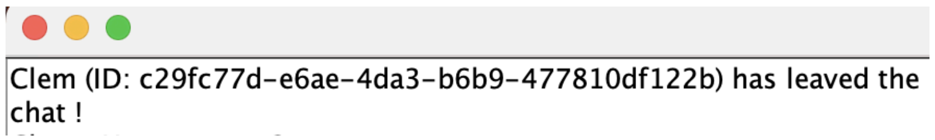
- create the JoinMessage class permitting the creation of a message of type JoinMessage
- add a join message listener used to catch the moment when a new client arrive in the chat session in order to trigger the sending of the join message in the user interface
- call the sending of joining message when a new client is created, i.e when a new member join the group chat

In order to identify each user, we take the decision that users can choose their own username, but to avoid having trouble with users with the same username, we randomly generate a user ID string of 36 characters that will be associated with the newly joined user. This allows us to have the following results when a client join the session :



```
Joel (ID: d3057737-c9dc-4a2d-a6ab-3e41f0912bf2) has joined the
chat !
--== Group Chat ==--
```

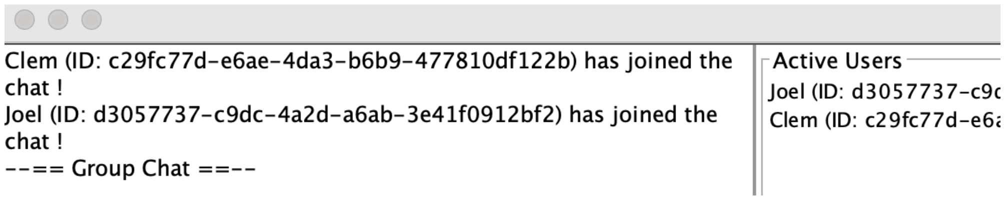
Following the same procedure, we implement a leave message that is sent when the client close the window of the chat application :



```
Clem (ID: c29fc77d-e6ae-4da3-b6b9-477810df122b) has leaved the
chat !
```

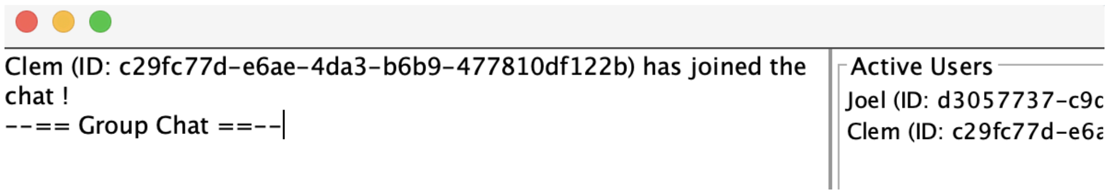
With the aim of keeping track of each active user, and because each client needs to know the list of the current active users in the group communication, we want to implement a list owned by each user with the list of the current users in the group communication. This implies that when a client joins the chat session, it should receive from all the active users a notification with their username and user ID, and also send its own information to the active users. As well as receiving all this information, we want each customer to update their list of active users.

To do so, we want all clients to have their own list of the active users and store the username and the userId of its user. Then, when a new customer is joining the session, each client will receive the join message and add the incoming user to the list of active users. After that, they will send a message containing their user information to every other client to notify them of their presence in the group chat. When a message of type UserInfoMessage is received by each customer, they will also add the user to their list of active users if the information received is different from their own IDs.



```
Clem (ID: c29fc77d-e6ae-4da3-b6b9-477810df122b) has joined the
chat !
Joel (ID: d3057737-c9dc-4a2d-a6ab-3e41f0912bf2) has joined the
chat !
--== Group Chat ==--
```

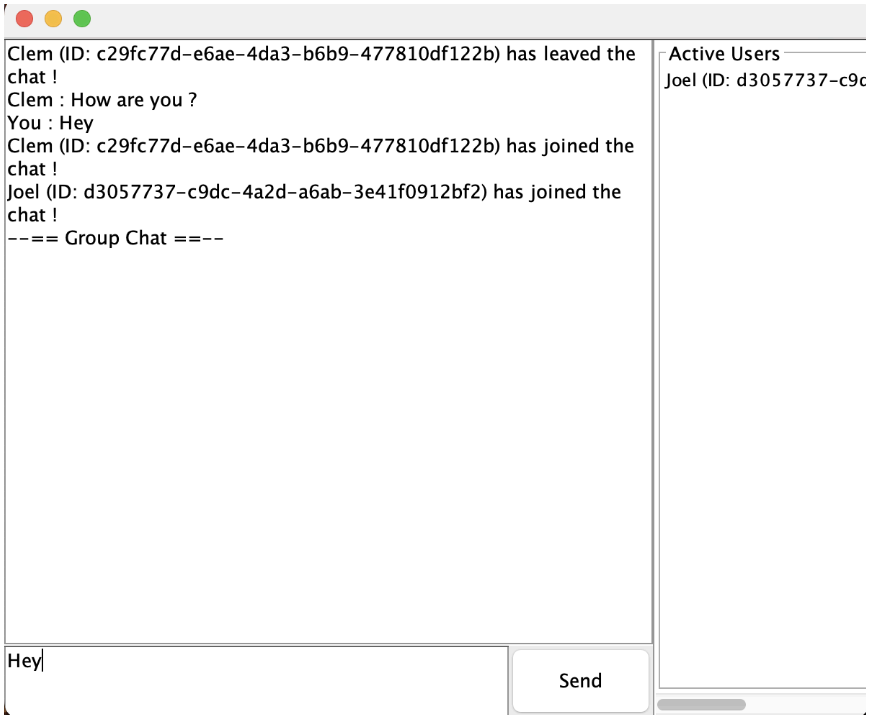
Active Users
Joel (ID: d3057737-c9c
Clem (ID: c29fc77d-e6a



```
Clem (ID: c29fc77d-e6ae-4da3-b6b9-477810df122b) has joined the
chat !
--== Group Chat ==--
```

Active Users
Joel (ID: d3057737-c9c
Clem (ID: c29fc77d-e6a

To have a user interface with all the necessary information displayed on the screen, we change it from a grid layout to a border layout, and we group together at the bottom of the window the sending message area and the send button. We also choose to add on the right side of the window another area with the aim of listing all the active users currently présent in the chat :



```
Clem (ID: c29fc77d-e6ae-4da3-b6b9-477810df122b) has leaved the
chat !
Clem : How are you ?
You : Hey
Clem (ID: c29fc77d-e6ae-4da3-b6b9-477810df122b) has joined the
chat !
Joel (ID: d3057737-c9dc-4a2d-a6ab-3e41f0912bf2) has joined the
chat !
--== Group Chat ==--
```

Active Users
Joel (ID: d3057737-c9c

Hey