
Group Messaging System

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Functionalities

- List groups
- Join groups
- Send messages to groups
- Receive message from groups
- Logout (go offline)
- Login (come online)

Design features

msgq_client.c (Client)

→ **!list** - This command lists out all the active groups (groups with at least one member). The groups are represented by a group id.

→ **!join <group_id>** - This command joins the client to the specified group number (may or may not be present in the list). Client can join multiple groups.


→ **!logout** - This command logs out the client. The client can still interact with the console (to login), but it stops receiving messages from groups.

→ **!login** - This command enables the client to login if logged out earlier. This command must be used to login before sending any messages after logout. The client will receive messages from all the groups it was part of (if any) when it was logged out.

→ **@<group_id><space><message>** - Format to send **<message>** to the group having group id as **<group_id>**. Client cannot send messages to a group before joining it.

→ The client queue is in the format **/<pid>q**.

→ The parent process keeps reading from the client queue (opened with **O_NONBLOCK** flag). The child process reads messages from user (STDIN) and sends them to the server. If logged out, the parent process is sent to a waiting state due to a **SIGUSR1** signal from the



child. When client logs in, child sends a **SIGUSR2** signal to the parent to resume reading from the client queue. Now parent dumps all the messages received while in logout state.

→ The messages received are of the format **<message><space><pid>** where **<pid>** is the process id of the client who sent the message to the group.

→ On exit (SIGTSTP, SIGQUIT, SIGINT), it closes and unlinks all message queues.

msgq_server.c (Server)

→ Server queue name - **/sq**

→ Keeps log of all the messages sent to the groups and broadcasts messages to the intended groups (except the client who sent it).

→ Has a lookup table to maintain record of clients part of all the groups.

→ Maintains a list of active groups.

→ Appends pid of the client who sent the message to indicate who sent the message in the group.

→ On exit (SIGTSTP, SIGQUIT, SIGINT), it closes and unlinks all message queues.