**Client/Server Protocol:**

**Client-to-Server Grammar:**

LOG\_ON ::= LOG\_ON USER\_ID [A-Za-z0-9]+

LOG\_OFF ::= LOG\_OFF

START\_CHAT ::= START\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

EXIT\_CHAT ::= EXIT\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

ENTER\_CHAT ::= ENTER\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

SEND\_MESSAGE ::= SEND\_MESSAGE CONVERSATION\_ID [A-Za-z0-9]+ .\*

SEND\_INVITE ::= SEND\_INVITE CONVERSATION\_ID [A-Za-z0-9]+ USER\_ID [A-Za-z0-9]+

**Server-to-Client Grammar:**

USER\_LOG\_ON ::= USER\_LOG\_ON USER\_ID [A-Za-z0-9]+

When a new user logs on, update the client.

When the client logs on, update the client about all existing users.

USER\_LOG\_OFF ::= USER\_LOG\_OFF USER\_ID [A-Za-z0-9]+

When a user logs off, update the client.

ADD\_CONVERSATION ::= ADD\_CONVERSATION CONVERSATION\_ID [A-Za-z0-9]+

When a new conversation is created, update the client.

When the client logs on, update the client about all existing conversation names.

USER\_ENTER\_CHAT ::= USER\_ENTER\_CHAT CONVERSATION\_ID [A-Za-z0-9]+ USER\_ID [A-Za-z0-9]+

When a user enters a chat, update the client.

When the client logs on, update the client about all members of a conversation.

USER\_EXIT\_CHAT ::= USER\_EXIT\_CHAT CONVERSATION\_ID [A-Za-z0-9]+ USER\_ID [A-Za-z0-9]+

When a user exits a chat, update the client.

SEND\_MESSAGE ::= SEND\_MESSAGE CONVERSATION\_ID [A-Za-z0-9]+ USER\_ID [A-Za-z0-9]+ \_TEXT\_ .\*

RECEIVED\_INVITE ::= RECEIVED\_INVITE CONVERSATION\_ID [A-Za-z0-9]+

LOG\_ON ::= LOG\_ON USER\_ID [A-Za-z0-9]+

Open up the main window

LOG\_ON\_FAIL ::= (LOG\_ON\_FAIL0 | LOG\_ON\_FAIL1 )

LOG\_ON\_FAIL0 ::= LOG\_ON\_FAIL0

User is already logged on

LOG\_ON\_FAIL1 ::= LOG\_ON\_FAIL1 USER\_ID [A-Za-z0-9]+)

Username is already in use

LOG\_OFF ::= LOG\_OFF

Close all windows

LOG\_OFF\_FAIL ::= LOG\_OFF\_FAIL

User is not logged on

START\_CHAT ::= START\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

Open up a new window for the conversation

START\_CHAT\_FAIL ::= (START\_CHAT\_FAIL0 | START\_CHAT\_FAIL1)

START\_CHAT\_FAIL0 ::= START\_CHAT\_FAIL0

User is not logged on

START\_CHAT\_FAIL1 ::= START\_CHAT\_FAIL1 CONVERSATION\_ID [A-Za-z0-9]+

Conversation name is already in use

ENTER\_CHAT ::= ENTER\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

Open up a new window for the conversation

ENTER\_CHAT\_FAIL ::= (ENTER\_CHAT\_FAIL0 | ENTER\_CHAT\_FAIL1 | ENTER\_CHAT\_FAIL2)

ENTER\_CHAT\_FAIL0 ::= ENTER\_CHAT\_FAIL0

User is not logged on

ENTER\_CHAT\_FAIL1 ::= ENTER\_CHAT\_FAIL1 CONVERSATION\_ID [A-Za-z0-9]+

Conversation name does not exist

ENTER\_CHAT\_FAIL2 ::= ENTER\_CHAT\_FAIL2

User is already in the conversation

EXIT\_CHAT ::= EXIT\_CHAT CONVERSATION\_ID [A-Za-z0-9]+

Close the conversation window if it is still open.

EXIT\_CHAT\_FAIL ::= (EXIT\_CHAT\_FAIL0 | EXIT\_CHAT\_FAIL1 | EXIT\_CHAT\_FAIL2)

EXIT\_CHAT\_FAIL0 ::= EXIT\_CHAT\_FAIL0

User is not logged on

EXIT\_CHAT\_FAIL1 ::= EXIT\_CHAT\_FAIL1 CONVERSATION\_ID [A-Za-z0-9]+

Conversation name does not exist

EXIT\_CHAT\_FAIL2 ::= EXIT\_CHAT\_FAIL2

User is not in the conversation

SEND\_MESSAGE\_FAIL ::= (SEND\_MESSAGE\_FAIL0 | SEND\_MESSAGE\_FAIL1 |SEND\_MESSAGE\_FAIL2)

SEND\_MESSAGE\_FAIL0 ::= SEND\_MESSAGE\_FAIL0

User is not logged on

SEND\_MESSAGE\_FAIL1 ::= SEND\_MESSAGE\_FAIL1 CONVERSATION\_ID [A-Za-z0-9]+

Conversation name does not exist

SEND\_MESSAGE\_FAIL2 ::= SEND\_MESSAGE\_FAIL2 CONVERSATION\_ID [A-Za-z0-9]+

User is not in the conversation

SEND\_INVITE\_FAIL ::= (SEND\_INVITE\_FAIL0 | SEND\_INVITE\_FAIL1 | SEND\_INVITE\_FAIL2 | SEND\_INVITE\_FAIL3)

SEND\_INVITE\_FAIL0 ::= SEND\_INVITE\_FAIL0

User is not logged on

SEND\_INVITE\_FAIL1 ::= SEND\_INVITE\_FAIL1 CONVERSATION\_ID [A-Za-z0-9]+

Conversation name does not exist

SEND\_INVITE\_FAIL2 ::= SEND\_INVITE\_FAIL2 CONVERSATION\_ID [A-Za-z0-9]+

User is not in the conversation

SEND\_INVITE\_FAIL3 ::= SEND\_INVITE\_FAIL3 USER\_ID [A-Za-z0-9]+

Username does not exist