CS594 Portland State
University May 2022
Internet Draft
Intended status: IRC Class Project Specification
Name: Archita Basavaraju
Lahari Katepalli

Programming Project: Internet Relay Chat (IRC) Protocol

Abstract:

This memo describes the communication protocol for an IRC-style client/server system for the Internetworking Protocols class at Portland State University. The goal of the RFC is to outline the programming project IRC client server application.

Table of Contents:

1. Introduction

This RFC outlines an IRC client server application. This system facilitates the group of users that are subscribed to the room receive messages of the other users in the room. Any message sent to that room is forwarded to all users currently joined to that room. Users can also send private messages directly to other users.

1.1 Server

The server is created using socket programming. It is a client-server model which follows TCP protocol. Multiple clients can connect to a server. The server stores the client information and their activities. The server shall be responsible for keeping a list of users and channels. The server responds to the specific predefined commands the user gives. The commands users in navigating through rooms and provide details about the commands too.

1.2 Client

A client can connect to a server. It provides information about itself for server to store and identify it. The client can send messages and requests to the server over this open channel, and the server can reply via the same. Client can join multiple rooms and can send broadcast messages in the room. Client can use the predefined commands to navigate through the rooms or change rooms.

1.3 Classes

User and room classes are defined.

1.3.1 User: The class User consists of the username, rooms in which the user is connected and the current room of the user. A room object is created whenever a new user is connected to the server.

```
class User:
   def __init__(self, Name):
      self.Name = Name
      self.R_Details = []
       self.Current_Room = ''
```

1.3.2 Room: The class Room constits of the details of the room users, the usernames and the name of the room. A room object is created whenever there is a new room is created. The Room is a blueprint which stores the details of the room.

```
class Room:
   def __init__(self, Name):
      self.Members = []
      self.Nick_Names = []
      self.Name = Name
```

2. Messages

The server and client can communicate through messages. If the message contains a defined command, the user should expect a response as provided, but it is not recommended to wait indefinitely for the response. Client-server communication is fundamentally asynchronous in nature. Each IRC message can include up to two components: the command and the command parameters.

Message Format:

The server and client communicate to each other through messages. If there is a "$" sign before any message the server interprets it as a command and description of which is mentioned below in use command section. Also, when a message is sent to server, it encoded and client receives it in the decoded byte format.

2.1 Help message

The help message is used to provide the client information on how to properly send commands to the server. If a help message is sent to server, the server will send the list of valid commands to the client who sent the message. The server on receiving the message, it shall offer the user who sent the message extra information on how to properly transmit that command to the server.

2.2 Nickname message

The nickname is a unique name given to the client. It is the first message the server sends the client when client connected to the server. The nickname provided is stored by server and is used to identify the client uniquely. The user object is created binding the nickname or Client IP to the room details and rooms.

2.3 Join message

If there exists a room with the given name, the user is added to the room and the username is added to the list of users in the room. If there is no room with the given name, a new room is created, and the name of the room is added to the list of rooms in the server. Once the user is added to the room, they can see and send broadcast messages in the room.

2.4 Leave message

Leave message is sent by the client to server when the client wants to quit the room. The client should specify the name of the room with the leave message to quit. If the user is not in the room, it sends error. The server removes the client from the list of users in the room when the message is sent.

2.5 Switch message

A user can join multiple rooms in a server. A user can only send messages in the current room. To send messages in other rooms, the user must switch the current room. The client requests server to switch the current room from existing to requested room. The server changes the user's current room to the requested room.

3. User Commands

3.1 list

Command: $list

Arguments: none

Description: The list command returns the list of rooms on the server with the details of the rooms and the users in the room.

3.2 join

By using the Join command, user can join a room from list of various rooms.

Command: $join

Argument:<roomname>

Description: The join command joins the user to the room if there already exists the roomname specified by user. If the roomname doesn't exist, a new room is created on the name provided by user.

3.3 personal

Command: $personal

Argument: <username> <message>

Description: Personal command is used to send a private message from one client to another client who is connected to the same server. The clients should be connected on the same server to send a private message.

3.4 help

Help command is used for seeking help when a problem is encountered by the user.

Command: $help

Argument: <command> (optional)

Description: The help command provides the available commands on server. It gives a detailed explanation about the commands and the parameters required for the commands.

3.5 Quit

Command: $quit

Argument: none

Description: The user can log off from the server using the quit command. When the user logs off, the server removes the client from the list of clients. The user object is removed and the information about the user is also removed.

3.6 leave

Command: $leave

Argument: <roomname> (optional)

Description: The leave command is used to leave the current room. If the user is not in any room, then an error is displayed. If the roomname doesn't exist, then error is displayed.

3.7 switch

By using switch command, user can change rooms. That is, they can switch from one room to other.

Command: $switch

Argument: <roomname>

Description: The switch command is used to switch the current room of the user to the requested room. If the user is already in the specified room, a message is displayed that user already exists in the room. If the roomname doesn't exist, the message is displayed that the room doesn't exist.

4. Extra Features

Personal message

The feature allows to message the other users of the room privately. The user can direct message the other users using the assigned command. The user can send a direct message to other user, if and if, the other user is also connected to the same server that the user sending the private message is connected to.