

Multi-threaded CLI chat server

Team:

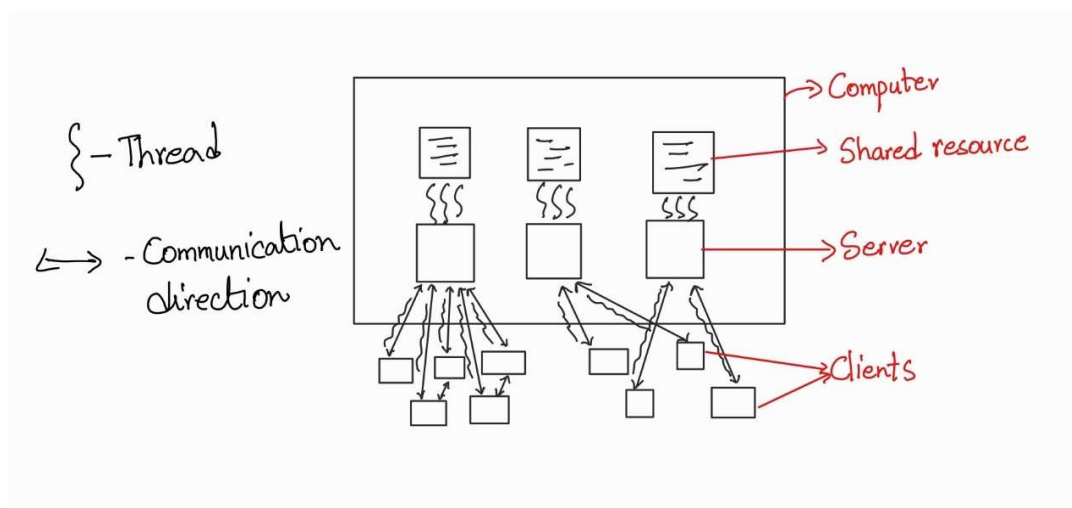
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A CLI application that spawns group chat servers and lets multiple clients connect to it, where a different thread handles each client. This server uses a file that stores all the history of the chat. Every thread accesses this file and appends the messages sent by their respective client.

The use of the threads aims to maximize the ability to serve multiple clients simultaneously. The threads will use necessary synchronization primitives to eliminate race conditions in appending the messages to the shared resource. With this server, the user will be able to create multiple chat servers that are analogous to group chat applications. In this application, clients can broadcast the message to every client on the server and individually message other clients with simple commands.



The above image shows the high-level architecture of the application. Many chat servers can be created on one computer, and many clients can connect to the server of their interest. The arrows represent the direction of communication, clients send messages to servers, and the server sends the message to every other client. If a client decides to send a personal message to another client, the server will only transfer the message to the requested client.

Every client is served with a different thread, and this thread will take care of reading the packet and appending the message to the shared resource and let other threads send the message to their clients upon the request of the server.

This project will enable us to learn more about using threads and implementing synchronization primitives in real-life applications. The problem we are trying to solve here is to build a lightweight communication system between servers. This application is now being used as a chat server between clients, but at its core lies a system that could send data between servers. This server is a much lighter communication service than using REST to communicate between servers.