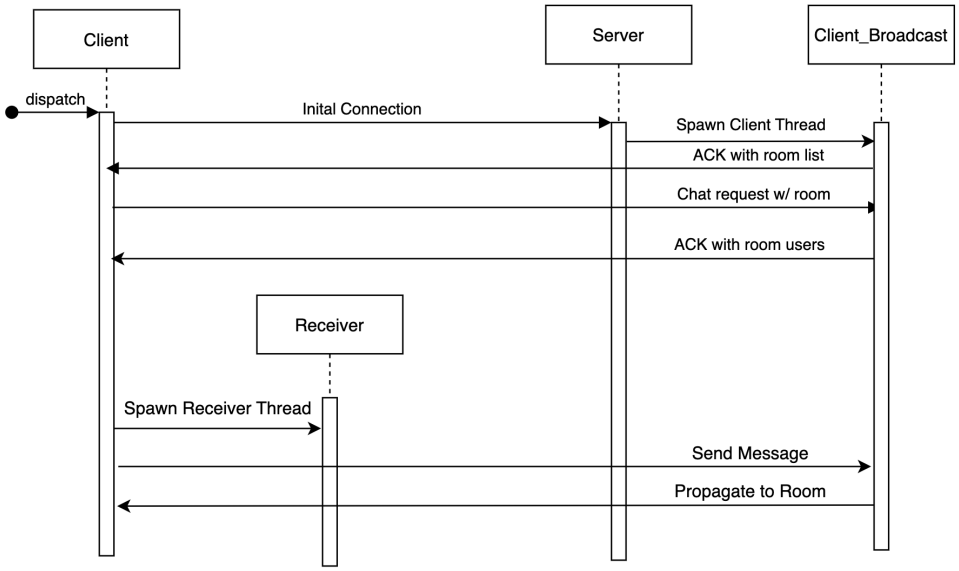
Chat Room Architectural Design



Server Architecture:

- The main server application is a standard TCP incoming request organizer. As connection requests come in the main thread will accept them and assign socket information, then create a client thread to handle that connection.
- Each client will have their own thread created in the server application. The client thread will validate the incoming message and reply with existing rooms.
- Upon a request for a specific room the client thread will add the user to that room, and and update the unique room list if this room doesn't already exist on the server.
- The client thread will send room entry notifications to any other client that is currently in the same chat room.
- The client thread then ACKs to the client with a list of users in that room.
- Finally the client thread enters a 'listening' phase where it monitors for incoming messages and upon receipt it sends a copy of this message to any other client residing in the same room.

Client Architecture:

- The client architecture goes through two distinct phases: a setup phase where all messages concerned with rooms/users are transmitted back and forth and then a 'room' phase where sending and receiving happens.
- The main thread of the application goes through the setup phase as detailed in the above flowchart before finally spawning a receiver thread and entering an input phase in the main thread.
- The main thread input phase monitors for user input and transmits it to the server while the receiver thread monitors for incoming messages from the server and displays it in the console.