

# Chat Server Programming Assignment

3/26/2018

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## Problem Statement

### Chat Server Programming Assignment

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#### Introduction

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You have to write a program based on provided requirements. You are free to use a programming language of your choice, preferably Java. Please state all assumptions when implementing a solution. It is important to deliver elegant object-oriented code, apply design patterns and consider performance of the implementation. In addition, please provide JUnit test cases and comments for the implemented classes. Your delivered program should compile (provide all required jars) and run.

#### Chat Server

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Develop a TCP/IP based multi-party chat server and client. Application should include appropriate unit test, error logging, and design documentation.

#### Server Requirements:

- Server should accept 1 to 10 simultaneous client connections
- A message received from any client should be echoed to all clients by default
- The server should log all client connect and disconnect events
- The listening IP and port address should be configurable

#### Client Requirements:

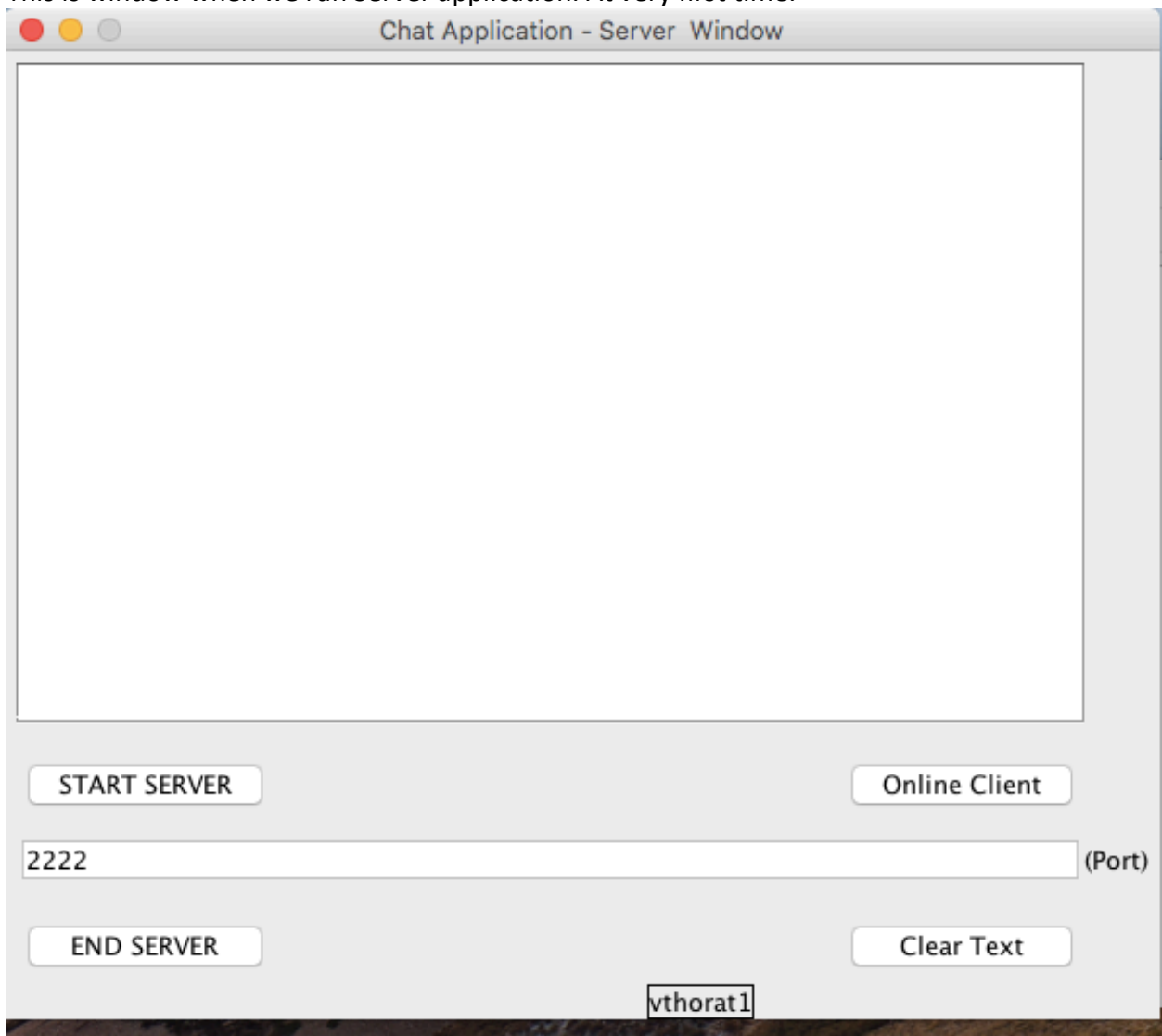
- The server IP and port address should be configurable
- The client should attempt to connect to the server and gracefully handle connection failures and disconnect events
- At start-up, the client should ask the user to provide a unique username
- The client should allow the user to enter an alpha-numeric text message
- Entered text messages should be transmitted to the server
- The client should display received text messages
- The client should be able to filter messages by user
- (Optional) The client should be able to send a message to a selected user

### Solution

The solution for given assignment is in two phases.

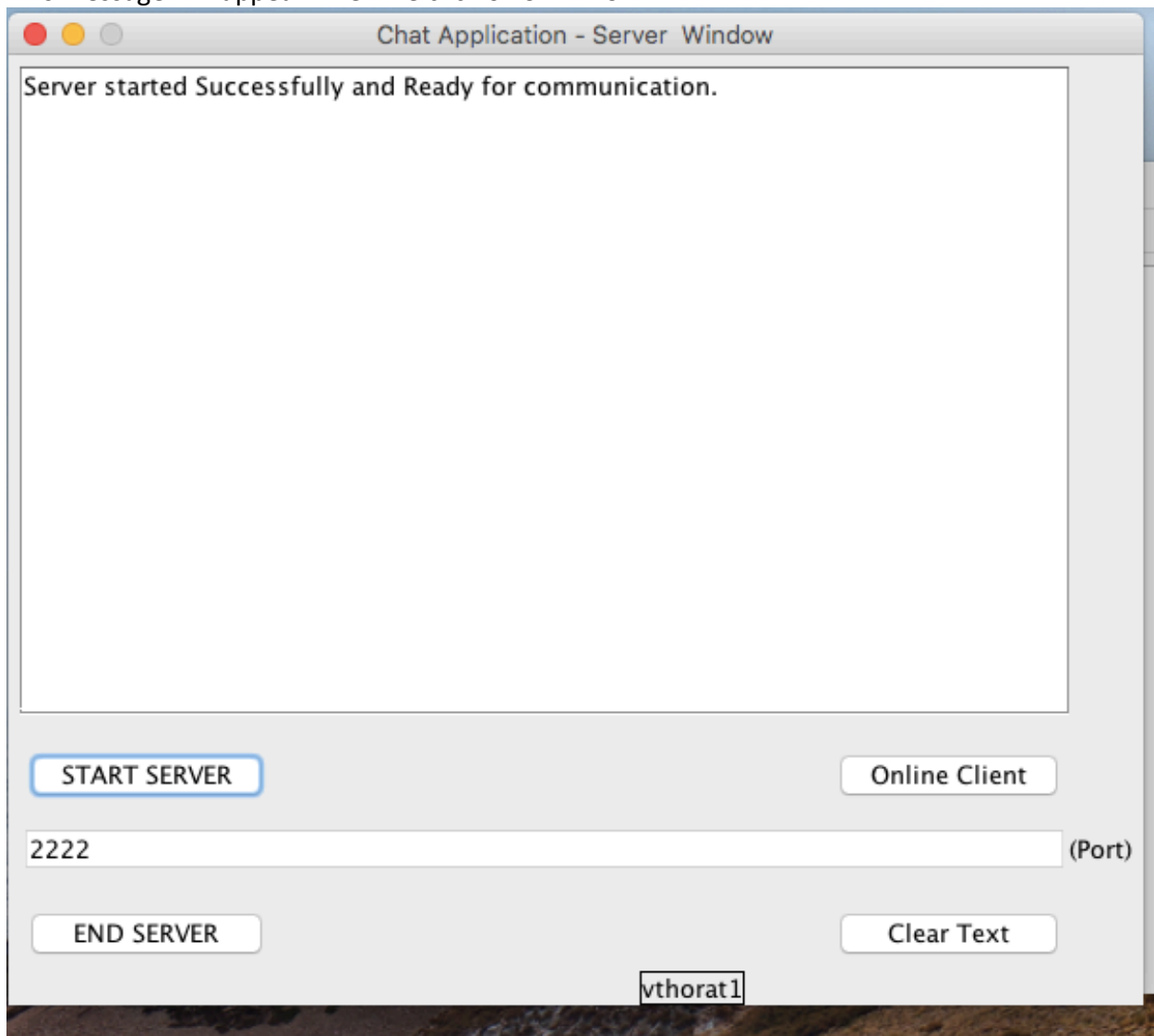
1. Screenshots of all over application.
2. Source code for given application.
3. Junit testing.
4. Logging file.
5. Two applications data.

This is window when we run Server application. At very first time.



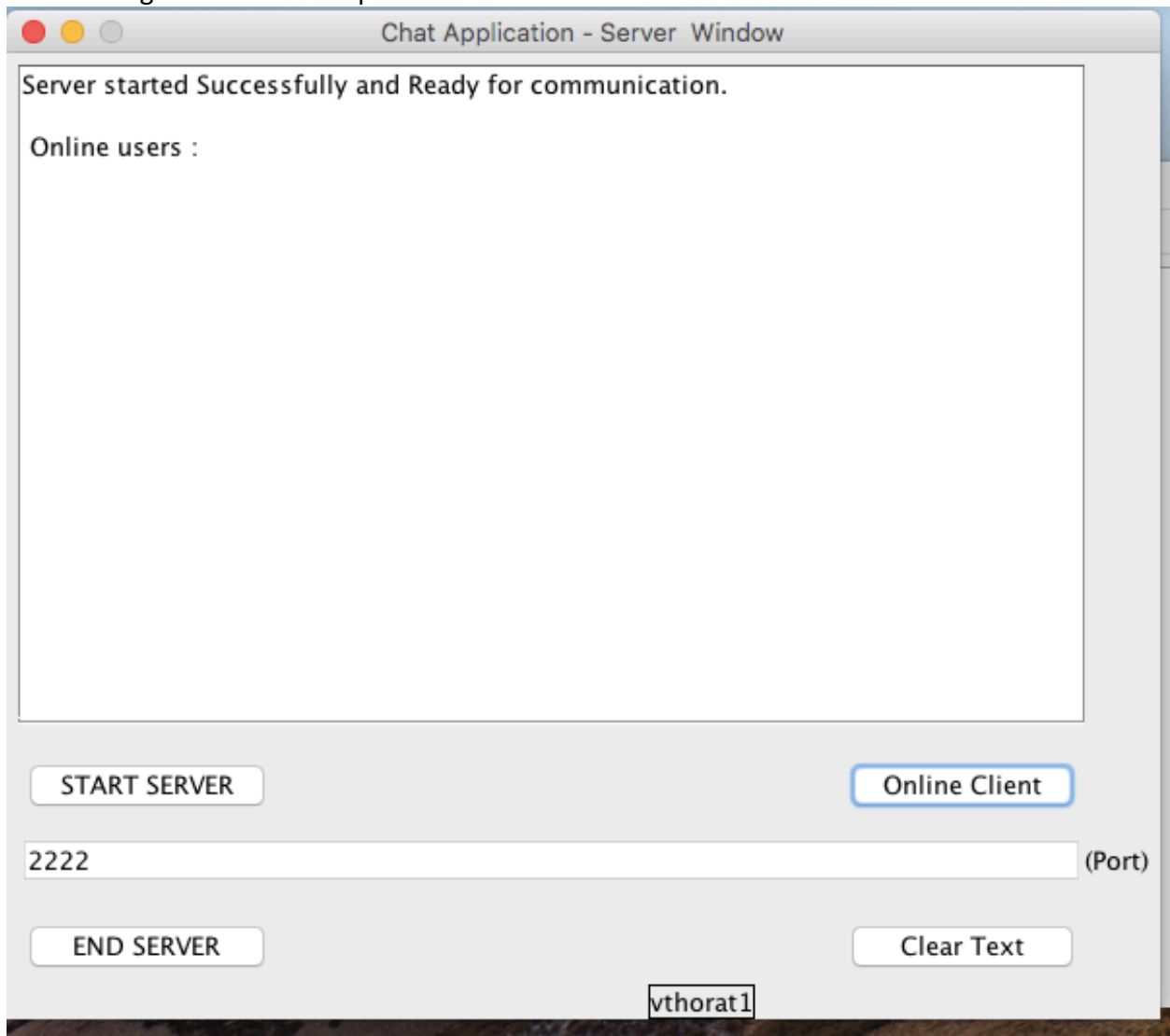
## Chat Application

This message will appear when we click on START SERVER.



## Chat Application

On Click of Online user it will show all connected clients for this socket with given IP and port number. Right now no client present.



## Chat Application

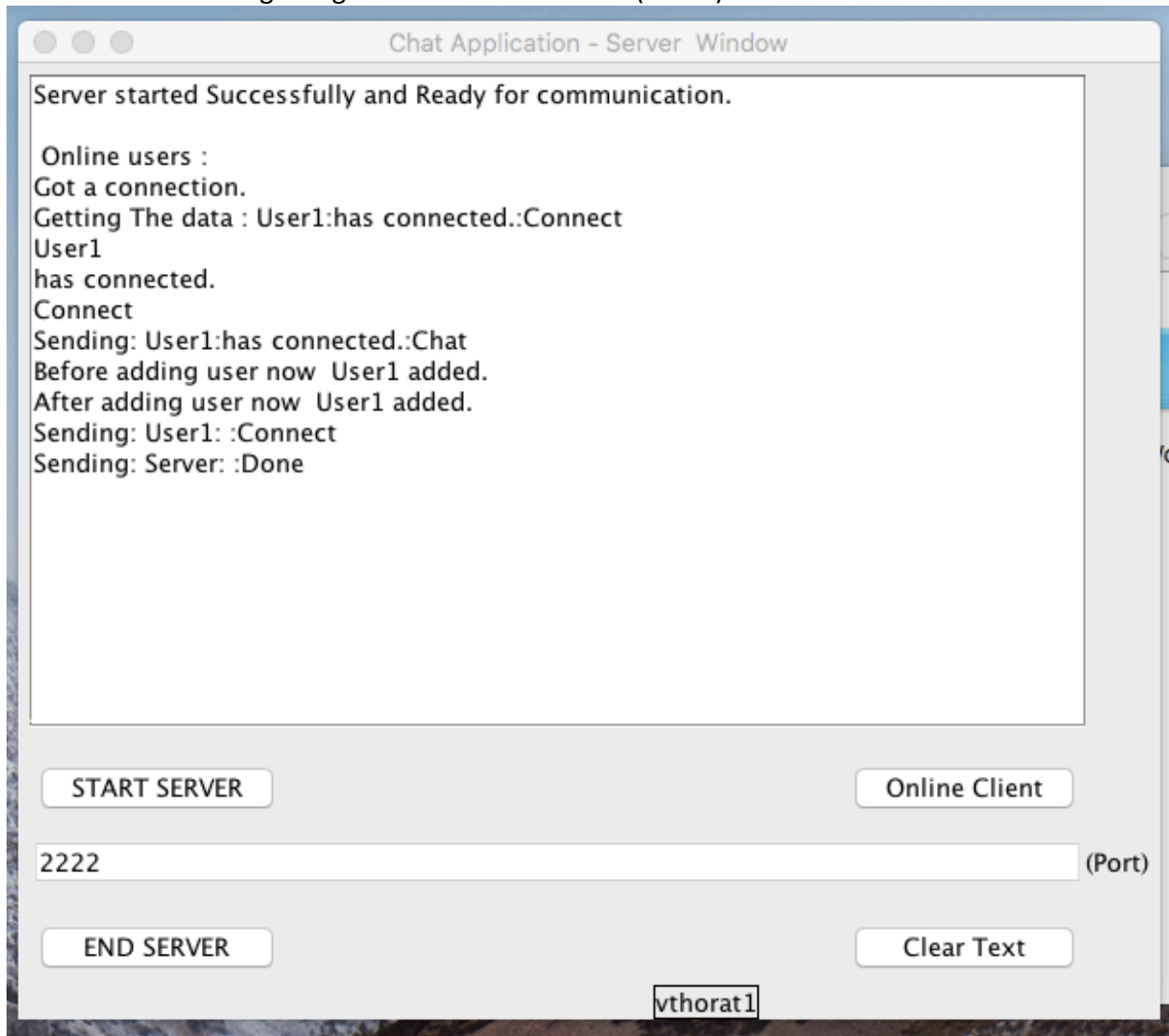
Client Screen, on first of client application.

The screenshot shows a window titled "Chat Application - Client Window". At the top, there are three colored window control buttons (red, yellow, green). Below the title bar, the interface is organized into several sections:

- Top Section:** Contains input fields for "IP Address" (with "localhost" entered), "Port" (with "2222" entered), and a "Guest Login" button.
- Second Section:** Contains a "User Name" input field, a "Sort by client Name:" dropdown menu (showing ".."), and two buttons labeled "Connect" and "Detach".
- Main Area:** A large, empty rectangular box intended for displaying chat messages.
- Bottom Section:** Features a wide text input field for typing messages and a "SEND MESSAGE" button positioned to its right.
- Status Bar:** A thin horizontal bar at the very bottom of the window, currently displaying the text "vthorat1".

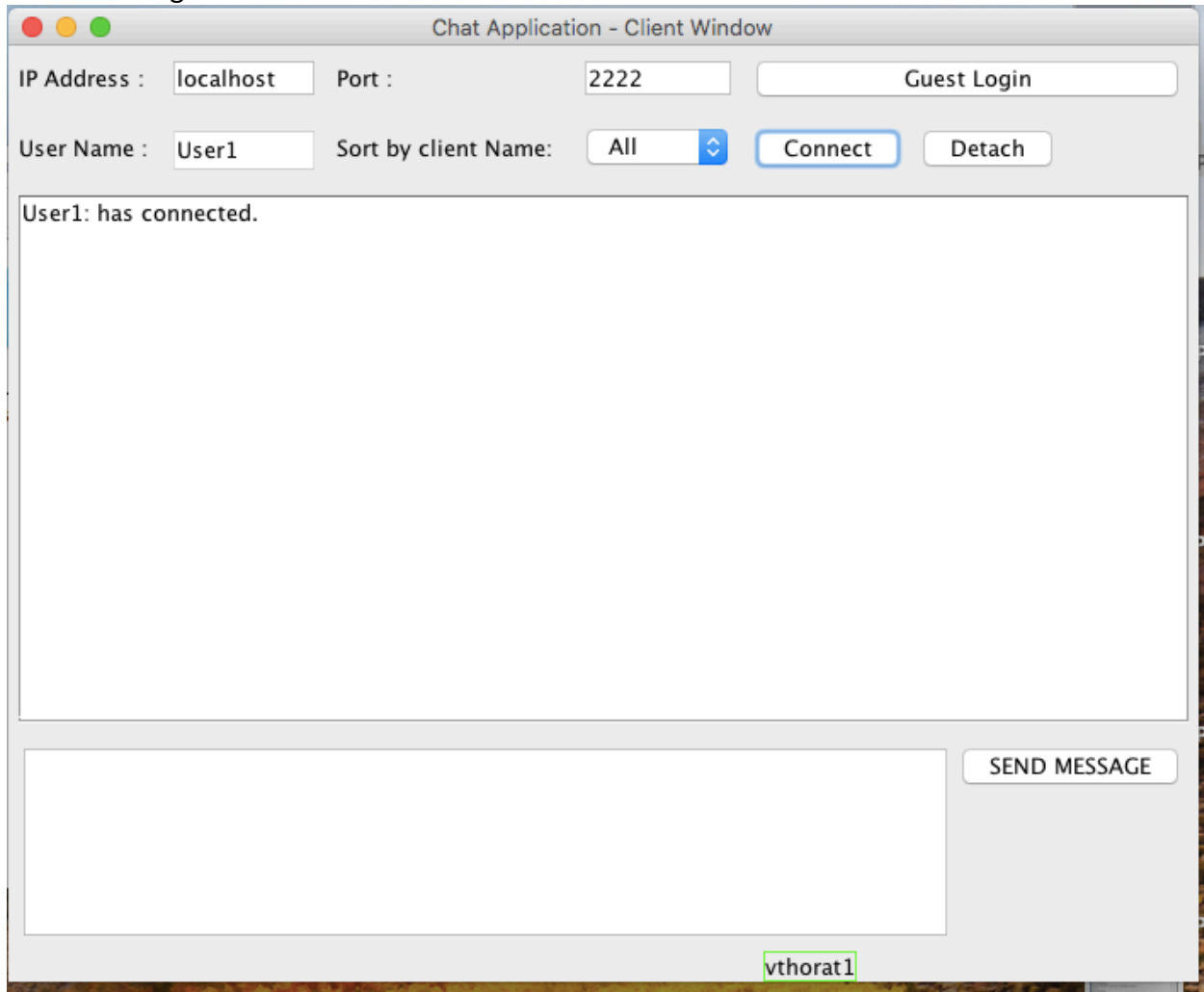
## Chat Application

Server window after getting connection from client (User1).



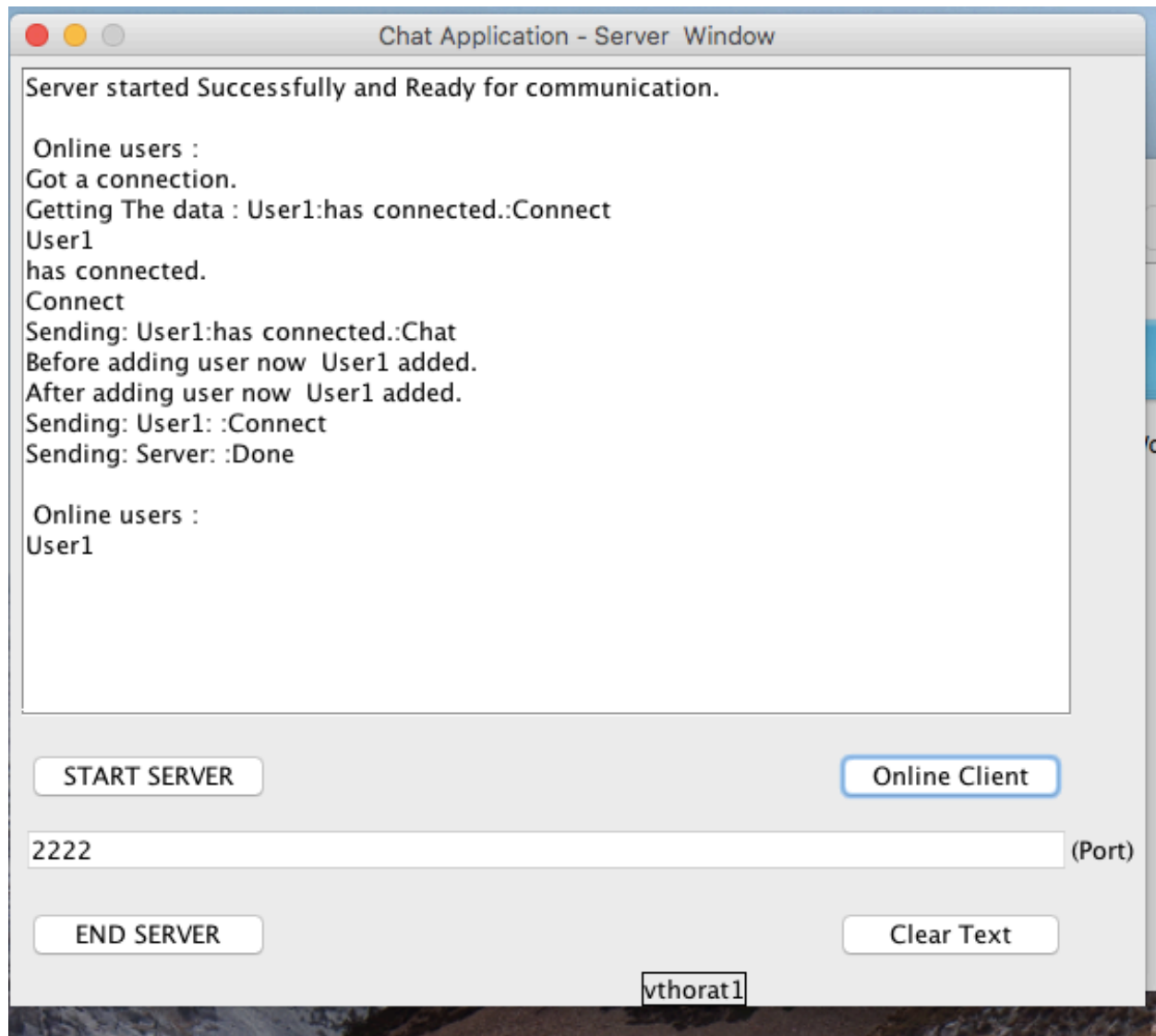
## Chat Application

After Click on connect it will show message like given below and it will broadcast all over the network using server.



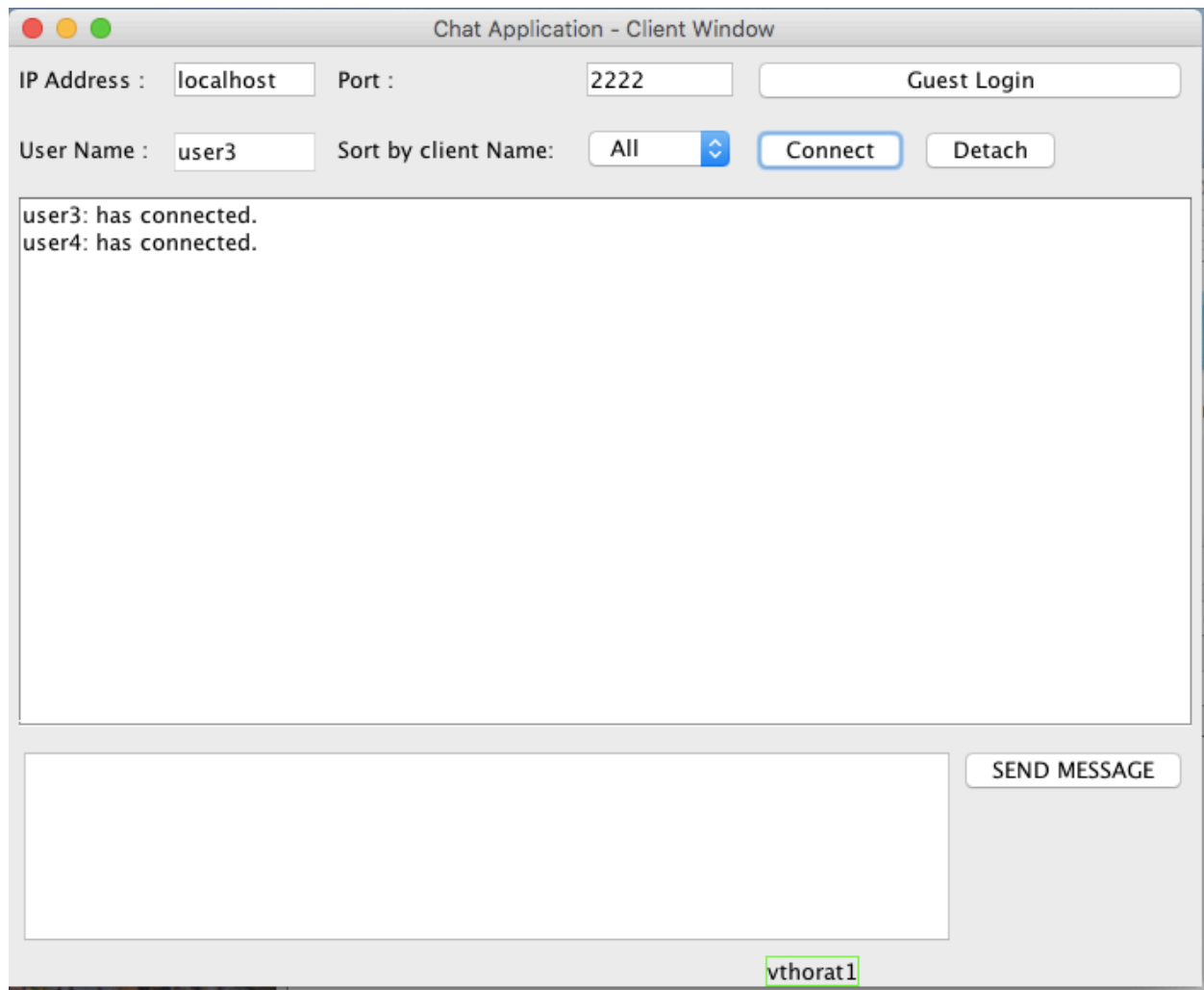


## Chat Application



When User 3 and user 4 got connected with given server.

## Chat Application



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with standard macOS window controls (red, yellow, green buttons). Below the header, there are input fields for "IP Address" (containing "localhost") and "Port" (containing "2222"), followed by a "Guest Login" button. Underneath, there is a "User Name" field (containing "user3"), a "Sort by client Name:" dropdown menu (set to "All"), and two buttons: "Connect" (highlighted with a blue border) and "Detach". A large text area in the center displays the messages "user3: has connected." and "user4: has connected.". At the bottom, there is a text input field for sending messages, a "SEND MESSAGE" button, and a status bar showing the username "vthorat1" in a green box.

Validation checking testing with wrong IP address Initially, so getting error message.

## Chat Application

Chat Application - Client Window

IP Address :  Port :

User Name :  Sort by client Name:

Cannot Connect! Try Again, check port Number.  
test: has connected.  
test 2: has connected.

vthorat1

## Chat Application

Filter on given user by using this drop down box.

The screenshot shows a window titled "Chat Application - Client Window". At the top, there are three colored window control buttons (red, yellow, green). Below the title bar, the interface includes:

- IP Address :  Port :
- User Name :  Sort by client Name: 

✓ All

test

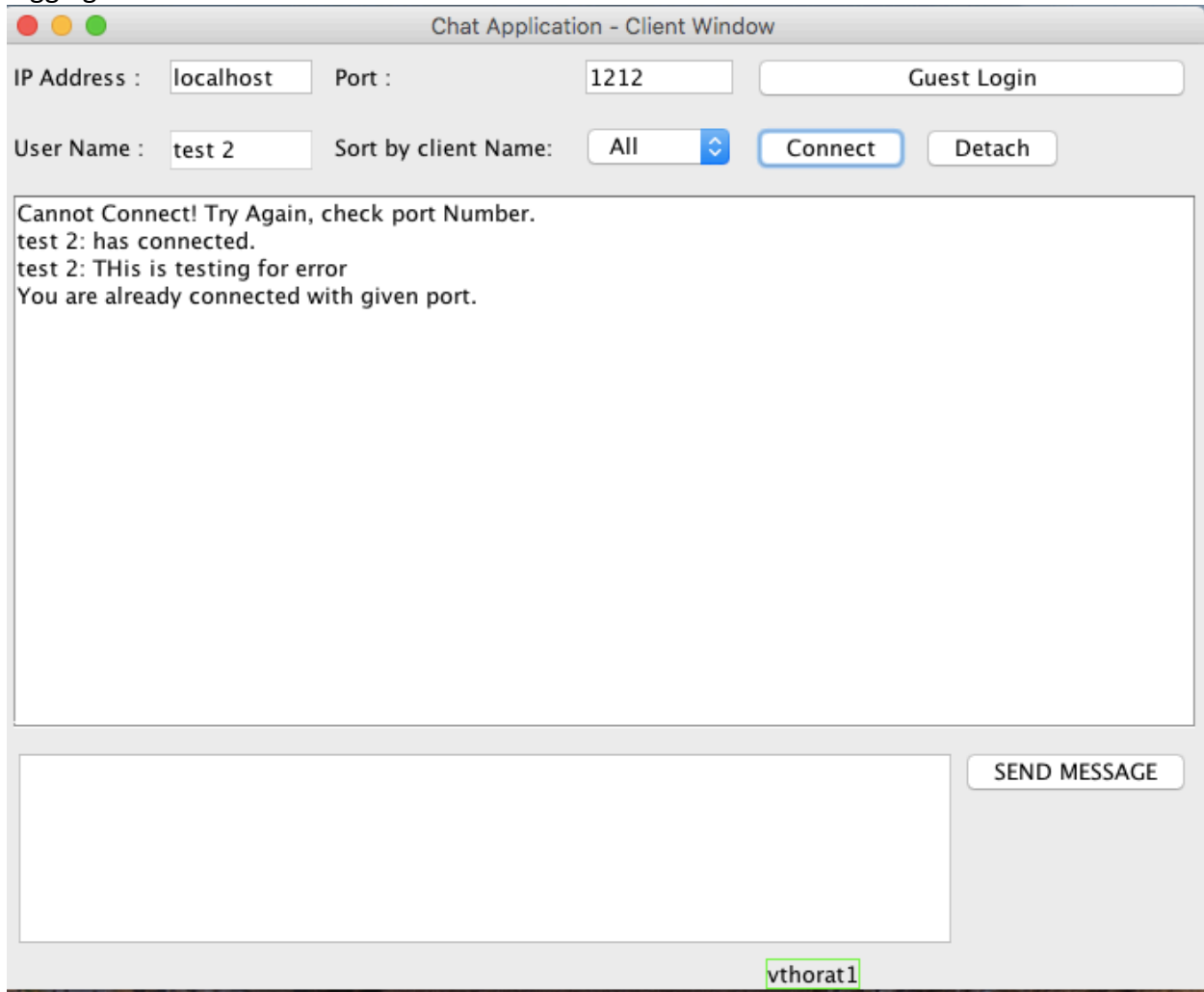
test 2

A large text area in the center contains the message: "Cannot Connect! Try Again, check port Number. test 2: has connected."

At the bottom, there is a text input field for sending messages, a  button, and a status bar at the very bottom displaying the text "vthorat1" in a green box.

## Chat Application

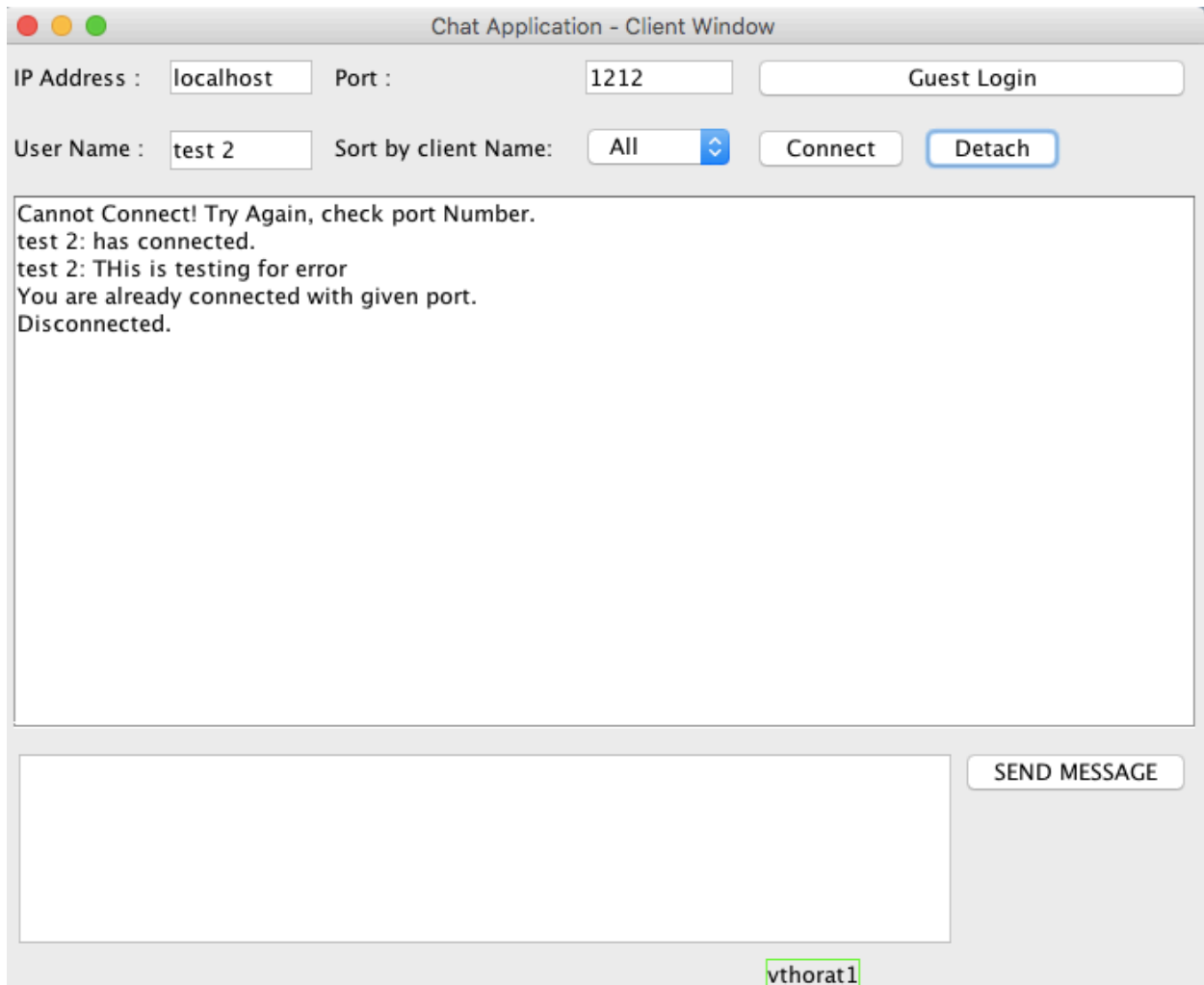
When we click again and again on connect button. It will give message and log error message in logging file.



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with three colored window control buttons (red, yellow, green) on the left. Below the header, there are input fields for "IP Address" (containing "localhost") and "Port" (containing "1212"), followed by a "Guest Login" button. Below these, there is a "User Name" field (containing "test 2"), a "Sort by client Name:" dropdown menu (set to "All"), and two buttons: "Connect" (highlighted with a blue border) and "Detach". The main area of the window is a large text box containing the following messages:  
Cannot Connect! Try Again, check port Number.  
test 2: has connected.  
test 2: THis is testing for error  
You are already connected with given port.  
At the bottom of the window, there is a large empty text input field for sending messages, a "SEND MESSAGE" button to its right, and a status bar at the very bottom displaying the username "vthorat1" in a green box.

## Chat Application

After clicking on disconnect button it is disconnecting from server and sending messages to all clients and server as well.



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with three colored window control buttons (red, yellow, green) on the left. Below the header, there are input fields for "IP Address" (containing "localhost") and "Port" (containing "1212"), followed by a "Guest Login" button. Below these, there is a "User Name" field (containing "test 2"), a "Sort by client Name:" dropdown menu (set to "All"), and two buttons: "Connect" and "Detach" (which is highlighted with a blue border). The main area of the window is a large text box containing the following messages: "Cannot Connect! Try Again, check port Number.", "test 2: has connected.", "test 2: THis is testing for error", "You are already connected with given port.", and "Disconnected.". At the bottom of the window, there is a large text input field for sending messages, a "SEND MESSAGE" button to its right, and a status bar at the very bottom displaying the username "vthorat1" in a green box.

Chat Application - Client Window

IP Address : localhost Port : 1212 Guest Login

User Name : test 2 Sort by client Name: All Connect Detach

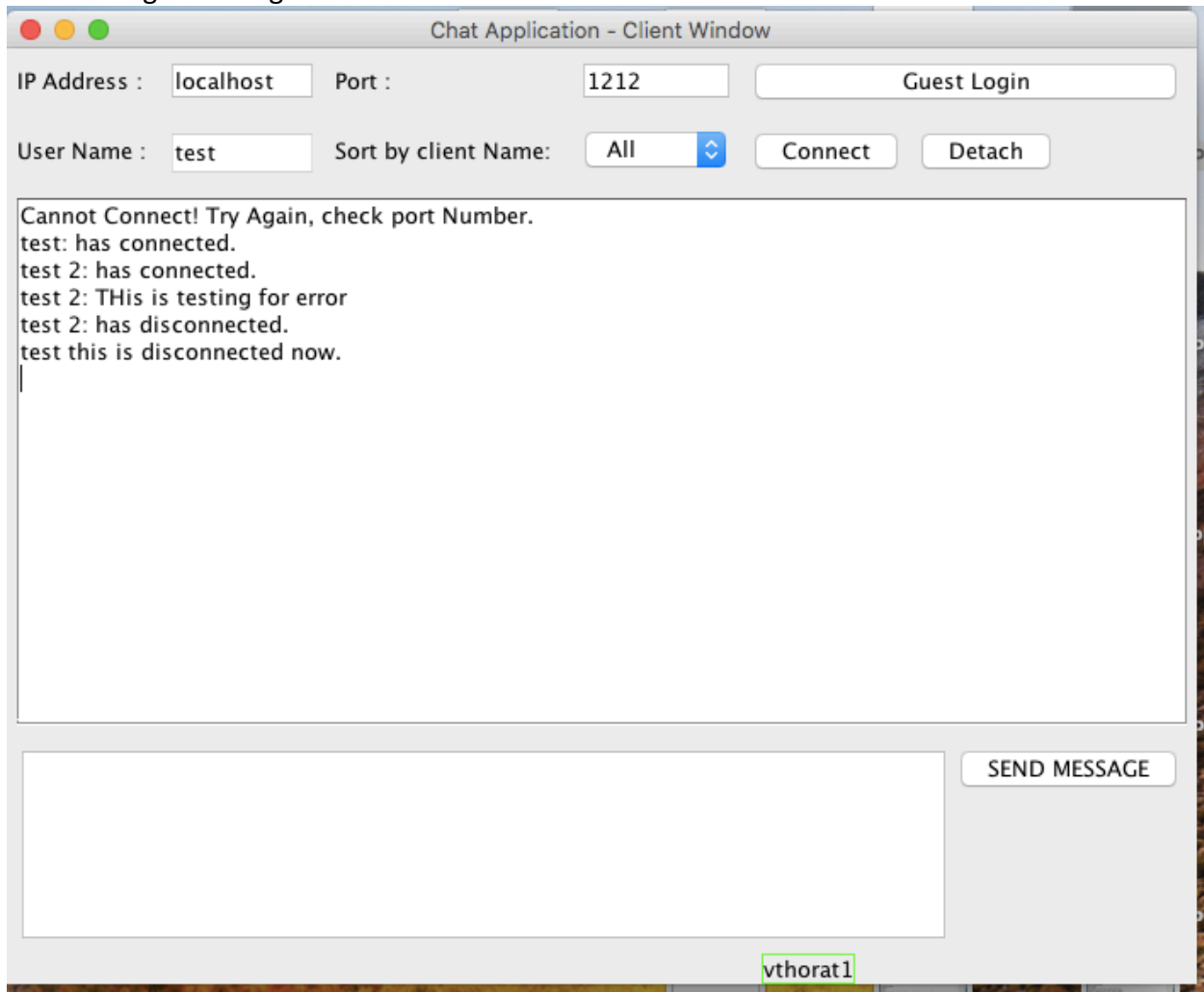
Cannot Connect! Try Again, check port Number.  
test 2: has connected.  
test 2: THis is testing for error  
You are already connected with given port.  
Disconnected.

SEND MESSAGE

vthorat1

## Chat Application

Test client got message that test is disconnected.



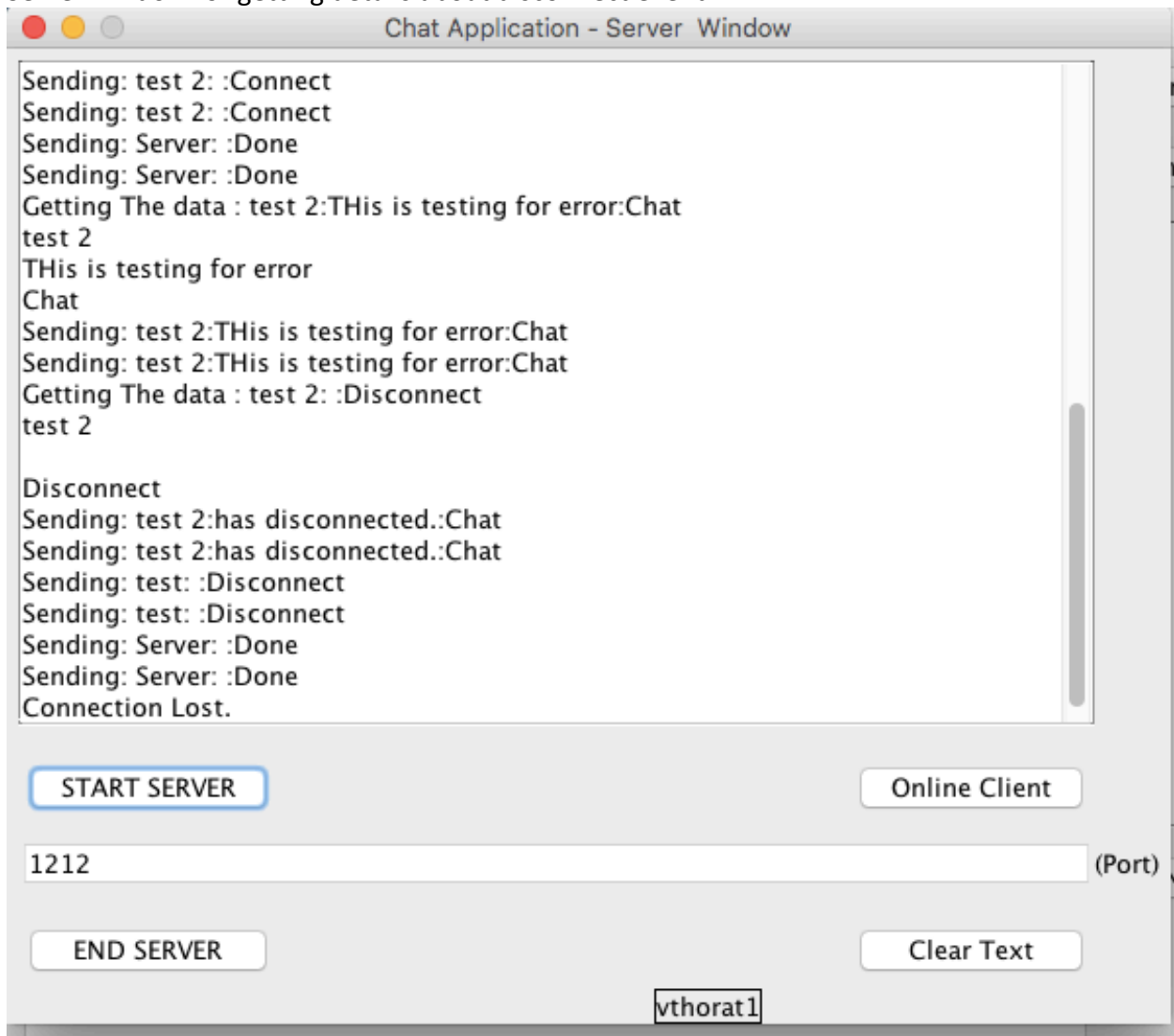
The screenshot shows a window titled "Chat Application - Client Window". It has a header bar with three colored buttons (red, yellow, green) on the left. Below the header, there are input fields for "IP Address" (containing "localhost") and "Port" (containing "1212"), followed by a "Guest Login" button. Below these, there is a "User Name" field (containing "test"), a "Sort by client Name:" dropdown menu (set to "All"), and two buttons: "Connect" and "Detach". The main area of the window is a large text box containing the following messages:

```
Cannot Connect! Try Again, check port Number.  
test: has connected.  
test 2: has connected.  
test 2: THis is testing for error  
test 2: has disconnected.  
test this is disconnected now.
```

At the bottom of the window, there is a text input field and a "SEND MESSAGE" button. The text "vthorat1" is visible in the bottom right corner of the window.

## Chat Application

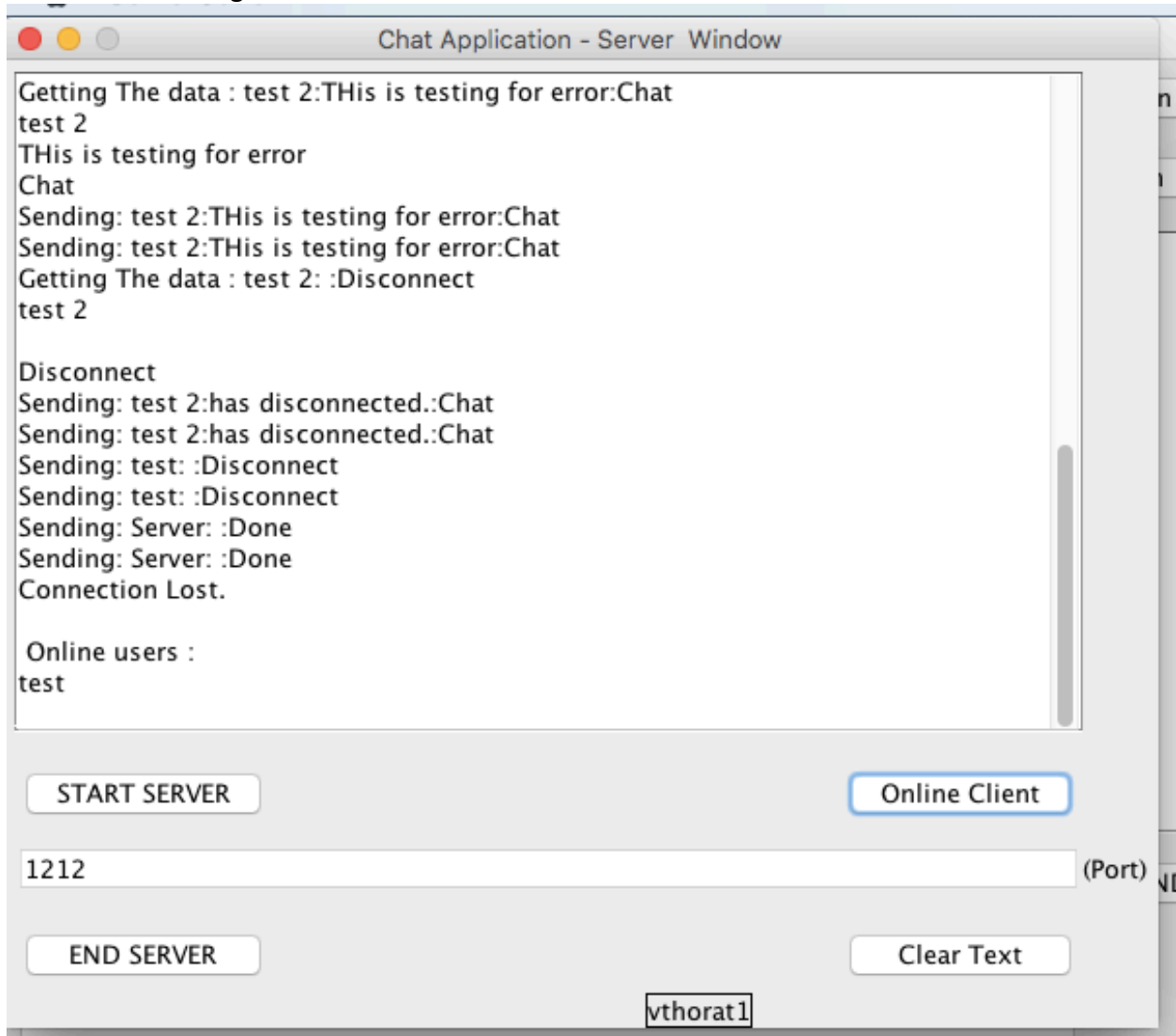
Server window for getting details about disconnect event.





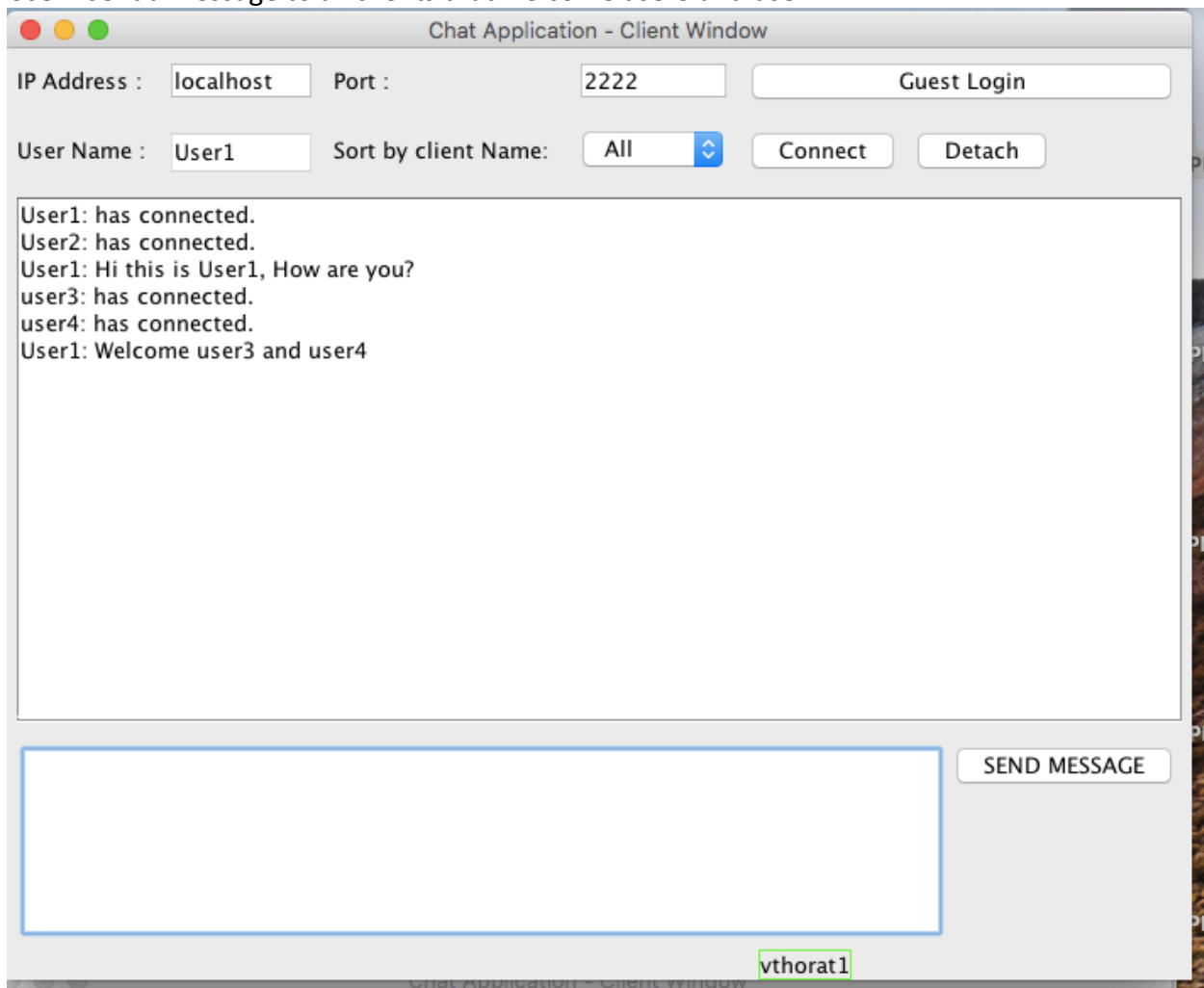
## Chat Application

After disconnecting checked all online users.



## Chat Application

User1 sent a message to all clients that welcome user3 and user4.



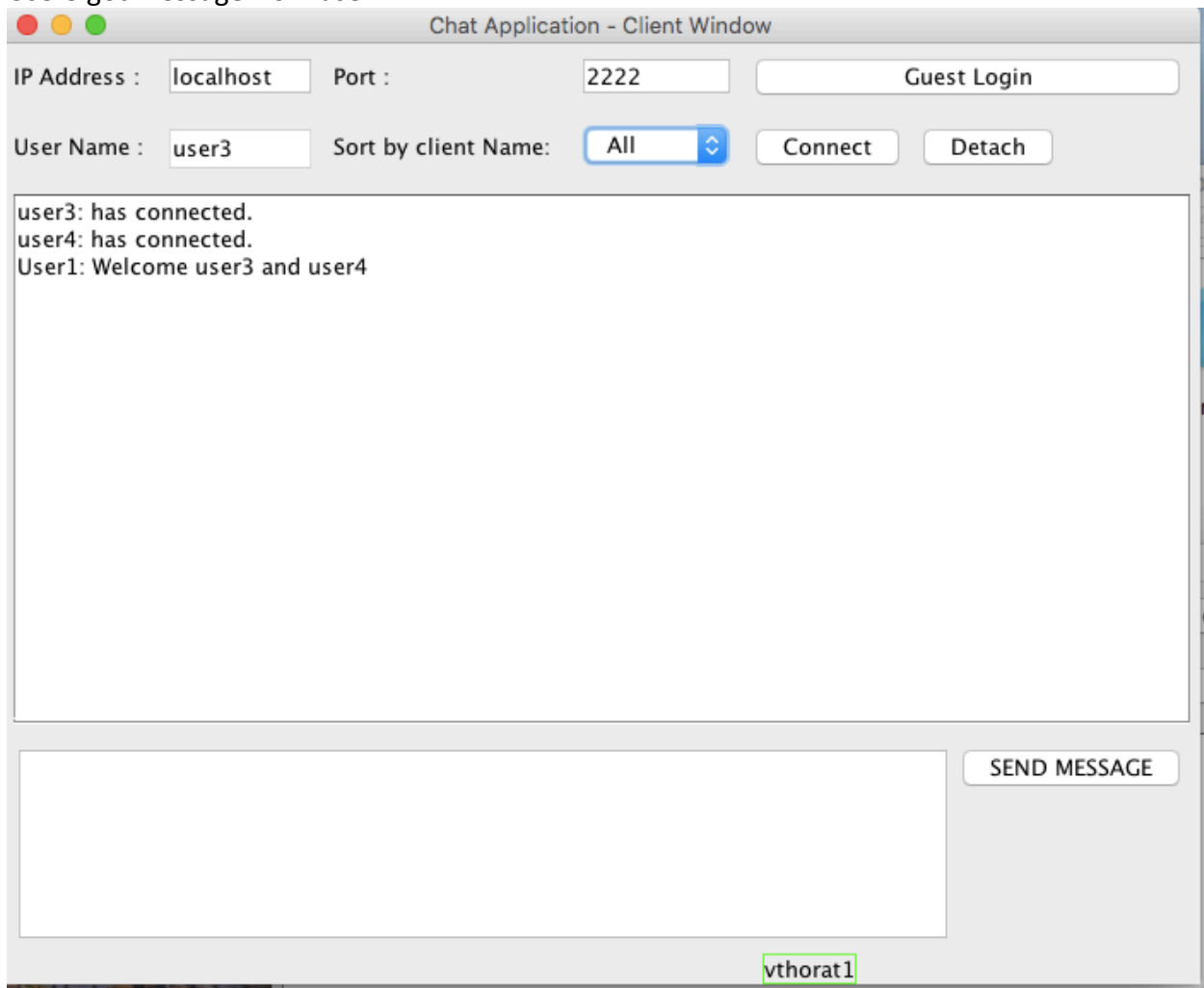
The screenshot shows a window titled "Chat Application - Client Window". It features a header area with fields for "IP Address" (localhost), "Port" (2222), and a "Guest Login" button. Below this is a section for "User Name" (User1), a "Sort by client Name" dropdown (set to All), and "Connect" and "Detach" buttons. The main area is a text log displaying the following messages:

- User1: has connected.
- User2: has connected.
- User1: Hi this is User1, How are you?
- user3: has connected.
- user4: has connected.
- User1: Welcome user3 and user4

At the bottom, there is a large text input field and a "SEND MESSAGE" button. The username "vthorat1" is visible in the bottom right corner of the window.

## Chat Application

User3 got message from user1.



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with three colored window control buttons (red, yellow, green) on the left. Below the header, there are two rows of input fields and buttons. The first row contains "IP Address : localhost", "Port : 2222", and a "Guest Login" button. The second row contains "User Name : user3", "Sort by client Name:" with a dropdown menu showing "All", and "Connect" and "Detach" buttons. A large text area in the center displays the chat log: "user3: has connected.", "user4: has connected.", and "User1: Welcome user3 and user4". At the bottom, there is a text input field for sending messages, a "SEND MESSAGE" button, and a status bar showing the username "vthorat1".

Chat Application - Client Window

IP Address : localhost Port : 2222 Guest Login

User Name : user3 Sort by client Name: All Connect Detach

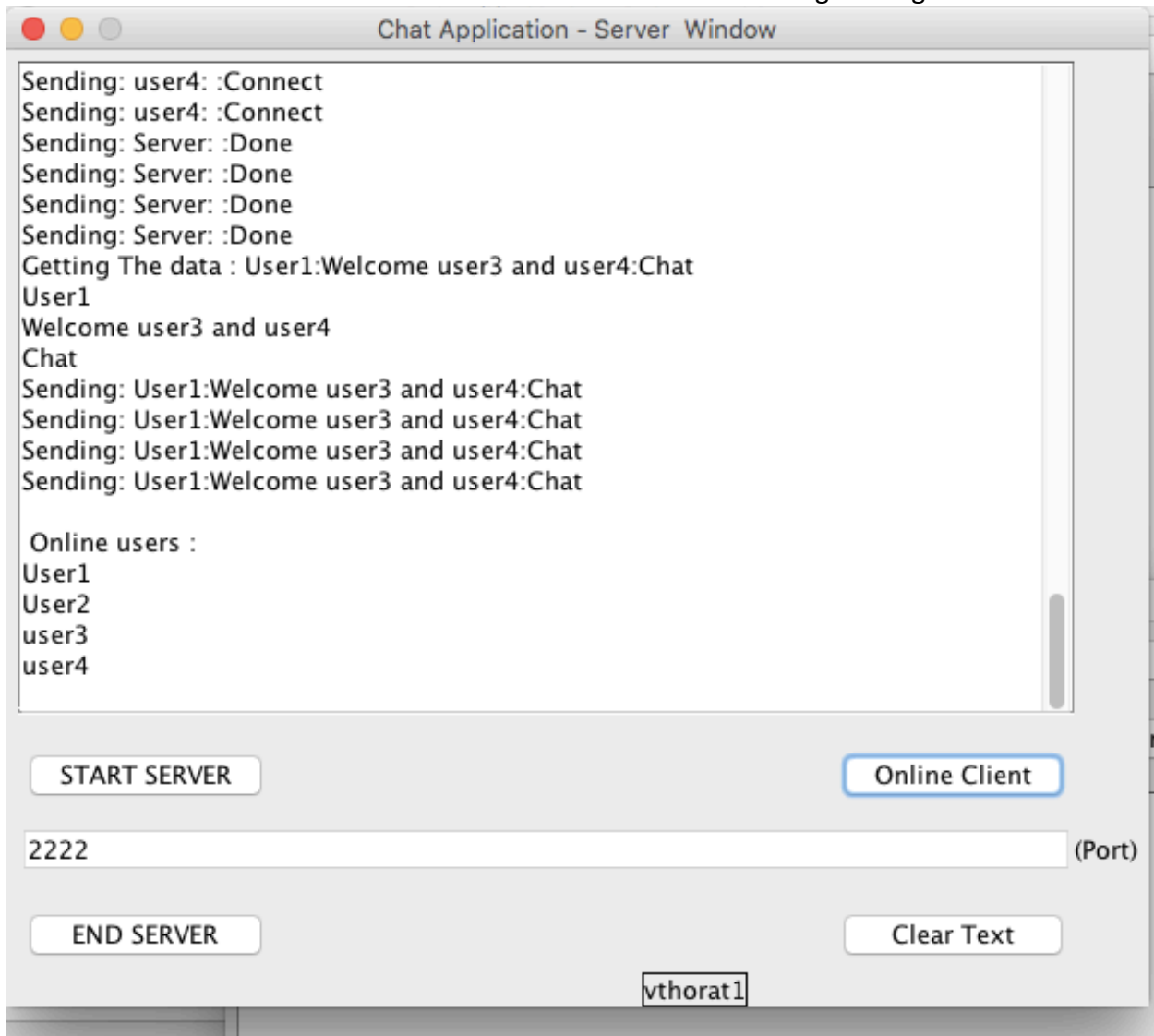
user3: has connected.  
user4: has connected.  
User1: Welcome user3 and user4

SEND MESSAGE

vthorat1

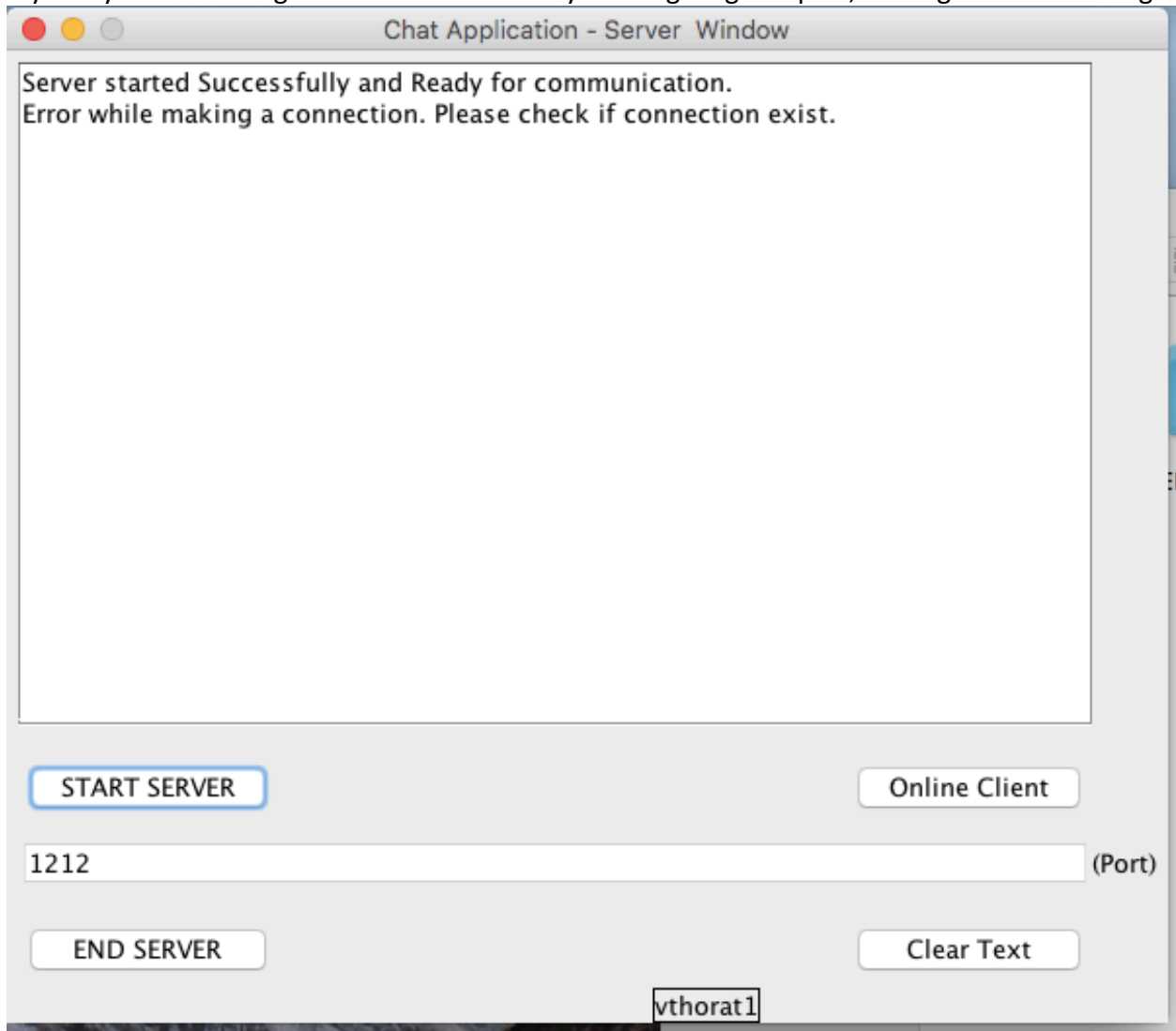
## Chat Application

Server box with all connection and online users with all broadcasting messages.



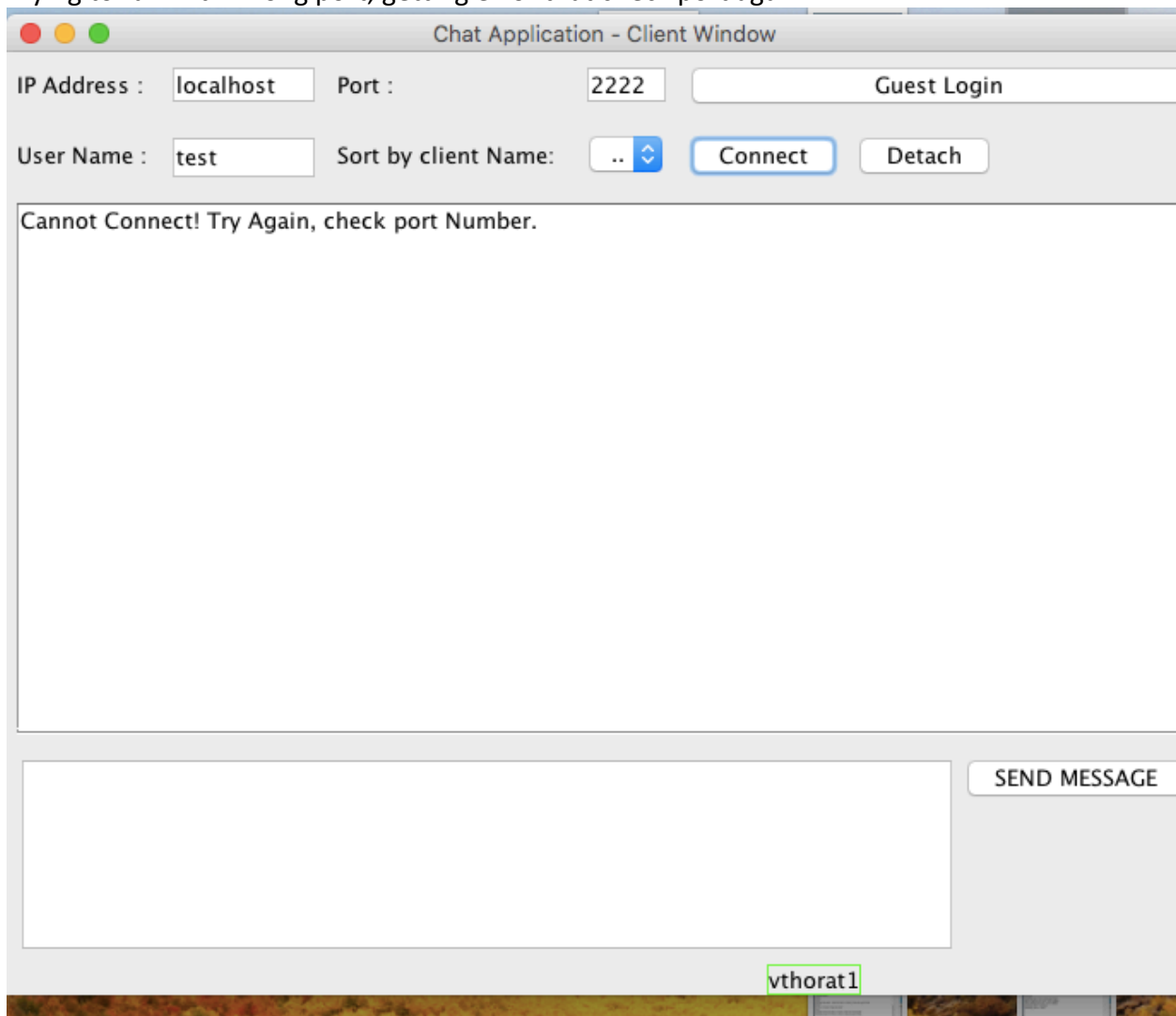
## Chat Application

If you try to connect again while server already running on given port, it will give error message.



## Chat Application

Trying to run with wrong port, getting error that check port again.



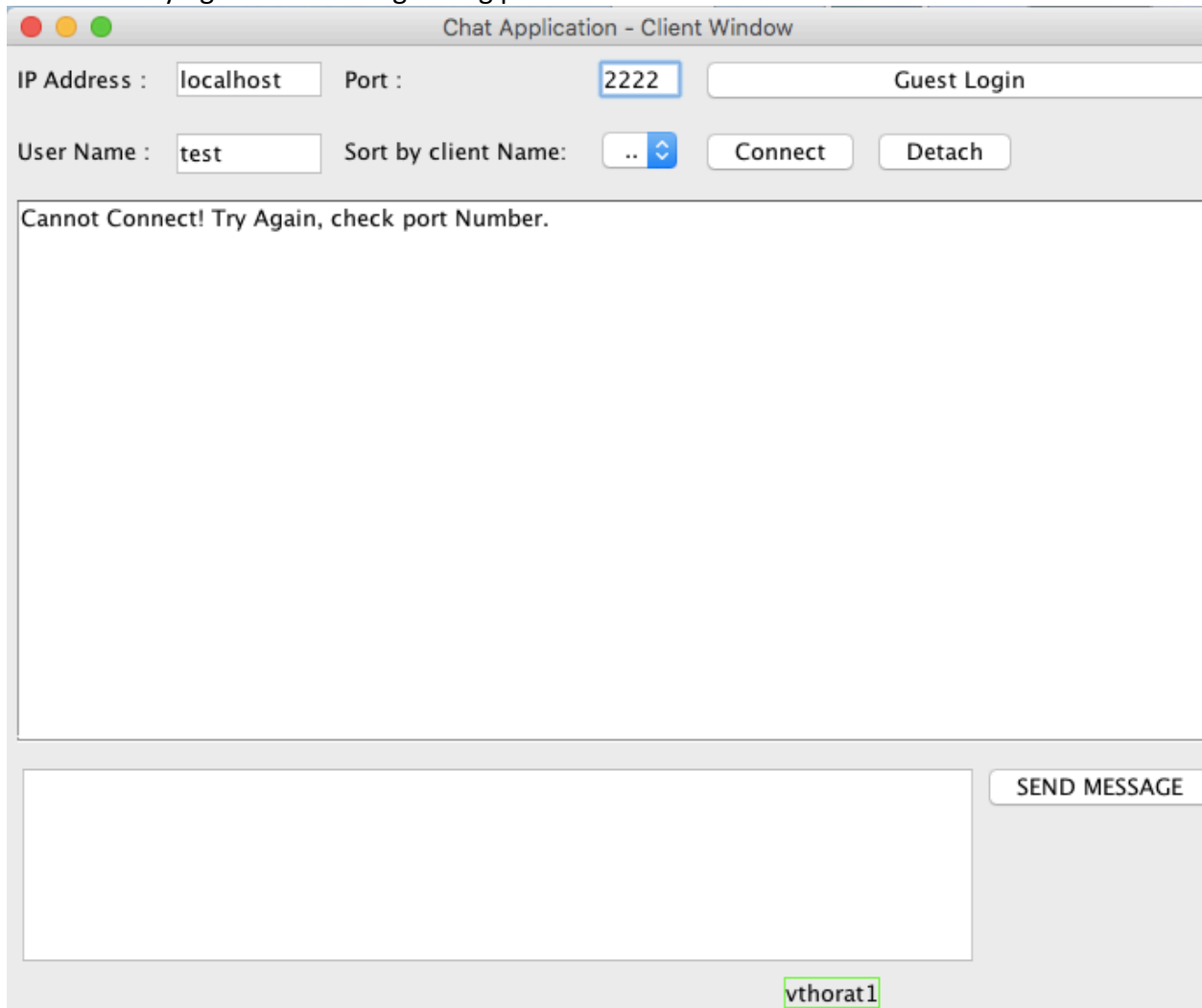
The screenshot shows a window titled "Chat Application - Client Window". It features a form with the following fields and controls:

- IP Address :** A text box containing "localhost".
- Port :** A text box containing "2222".
- Guest Login**: A button.
- User Name :** A text box containing "test".
- Sort by client Name:** A dropdown menu showing ".." and a blue arrow icon.
- Connect**: A button with a blue border.
- Detach**: A button.

Below the form, a message box displays the error: "Cannot Connect! Try Again, check port Number." Below this is a large empty text area for chat messages. At the bottom right, there is a "SEND MESSAGE" button and a text box containing the name "vthorat1".

## Chat Application

Test client trying to access using wrong port.

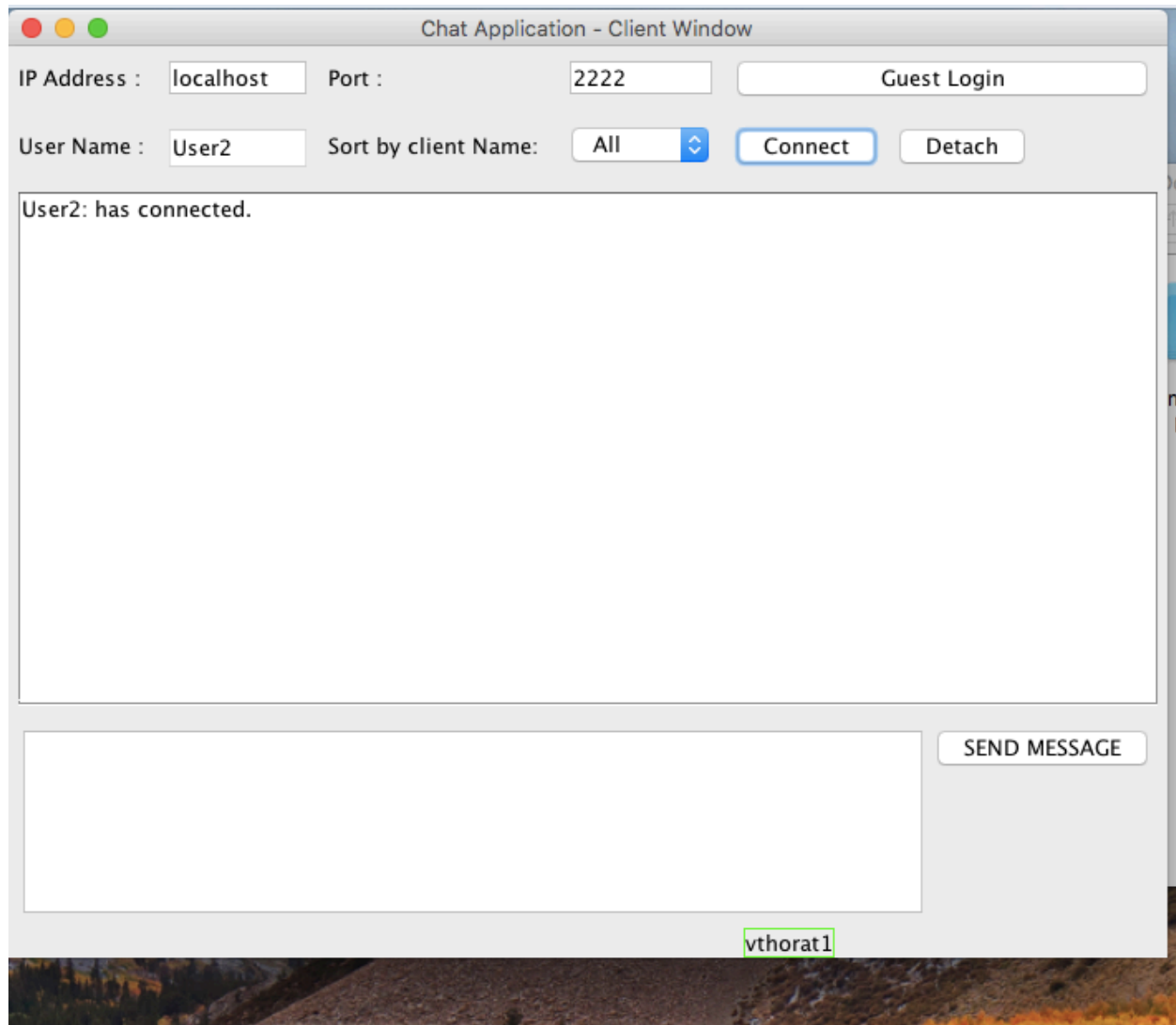


The screenshot shows a window titled "Chat Application - Client Window". It contains the following elements:

- IP Address :** A text box containing "localhost".
- Port :** A text box containing "2222", which is highlighted with a blue border.
- Guest Login**: A button.
- User Name :** A text box containing "test".
- Sort by client Name:** A dropdown menu showing "..".
- Connect** and **Detach**: Two buttons.
- Message Area**: A large rectangular area displaying the error message: "Cannot Connect! Try Again, check port Number."
- Input Area**: A large text box for typing messages.
- SEND MESSAGE**: A button.
- Username Display**: A small box at the bottom right showing "vthorat1".

On connection of user 2, chat screen of user 2.

## Chat Application



The image shows a screenshot of a web-based chat application interface. The window has a title bar with three colored buttons (red, yellow, green) and the text "Chat Application - Client Window". Below the title bar, there are several input fields and buttons. The "IP Address" field contains "localhost", the "Port" field contains "2222", and there is a "Guest Login" button. The "User Name" field contains "User2", and the "Sort by client Name" dropdown menu is set to "All". There are "Connect" and "Detach" buttons. A large text area displays the message "User2: has connected.". At the bottom, there is a text input field for sending messages, a "SEND MESSAGE" button, and a status bar showing the username "vthorat1".

Chat Application - Client Window

IP Address : localhost Port : 2222 Guest Login

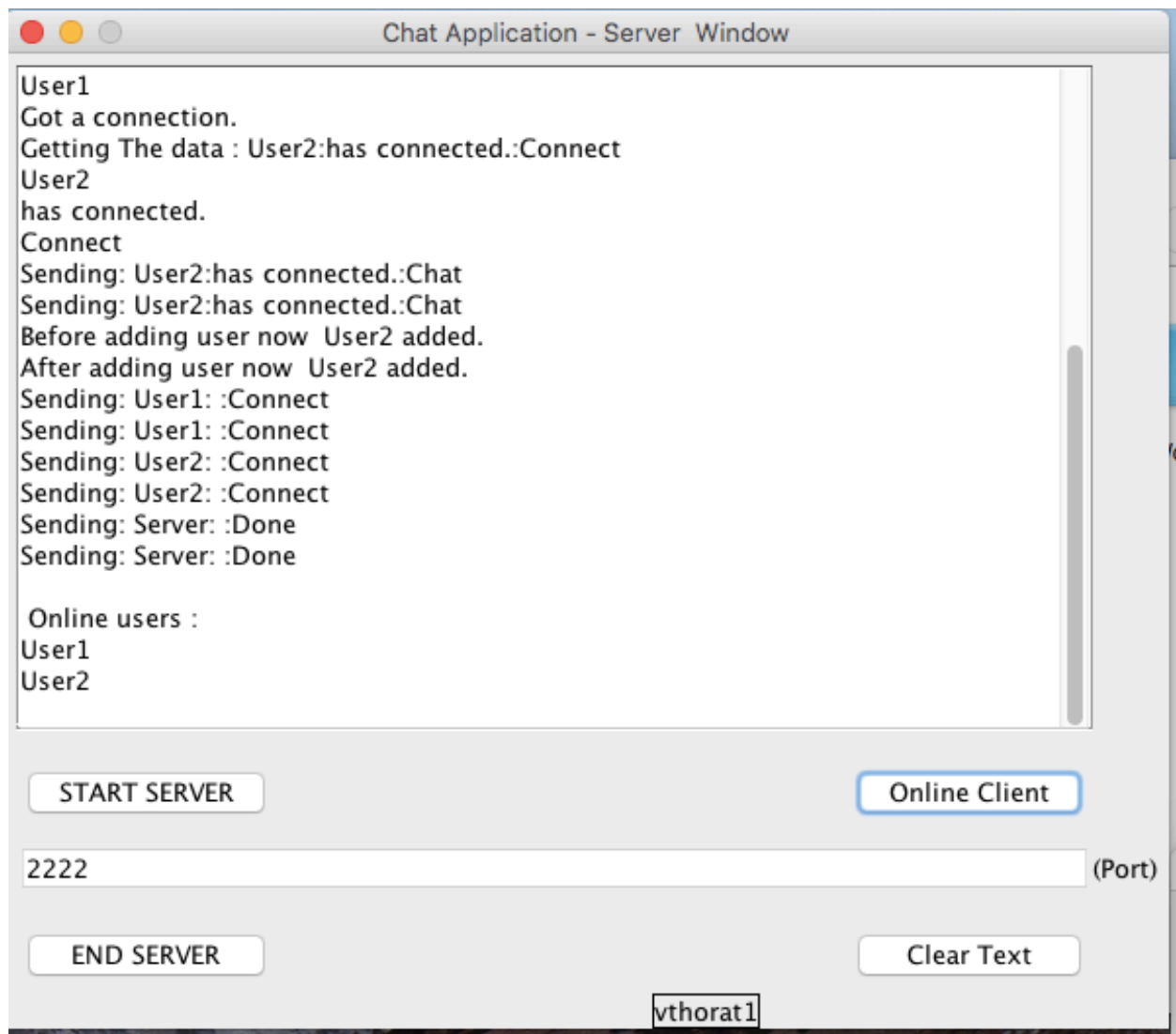
User Name : User2 Sort by client Name: All

User2: has connected.

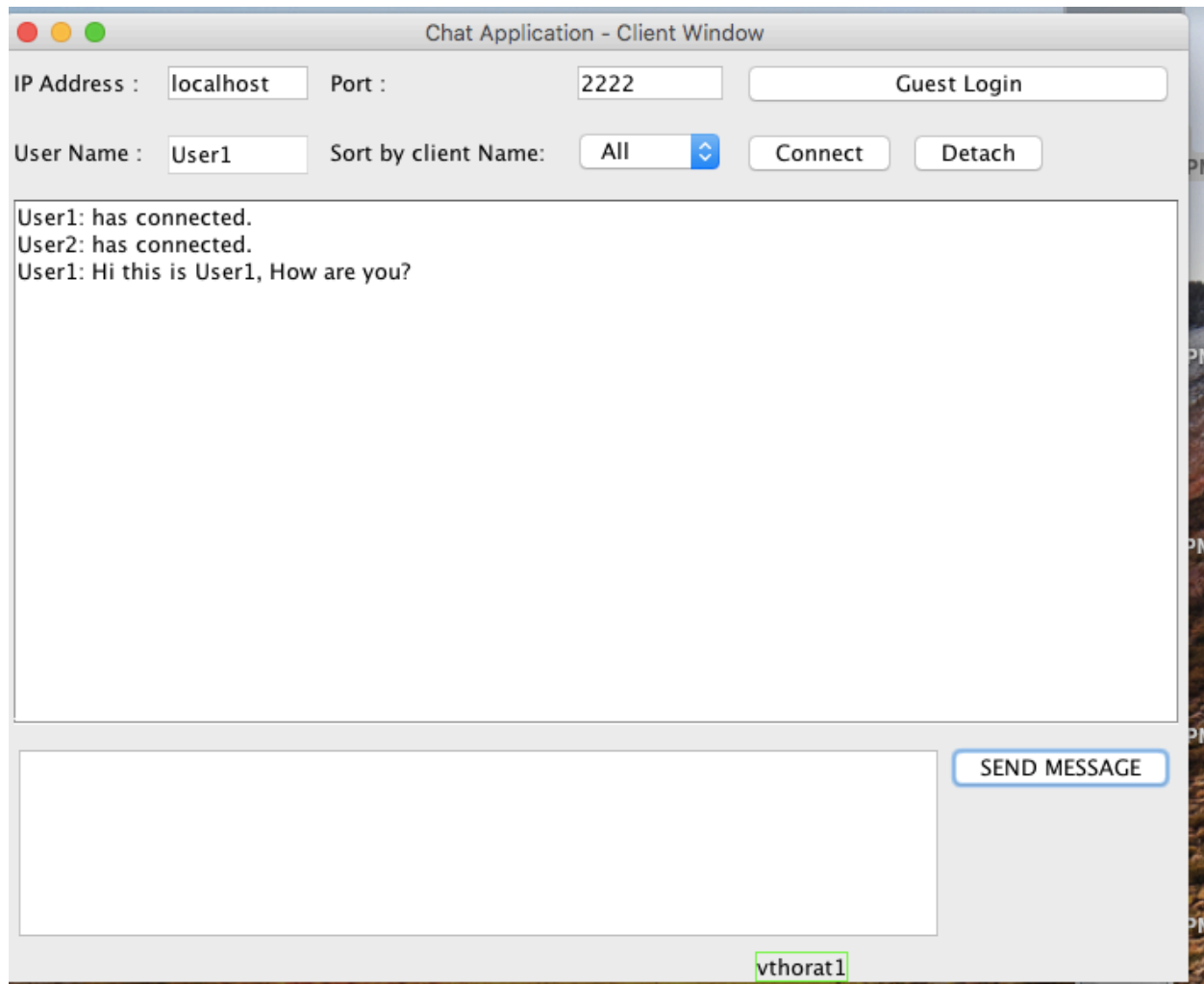
vthorat1



## Chat Application



## Chat Application



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with three colored window control buttons (red, yellow, green) on the left. Below the header, there are input fields for "IP Address" (containing "localhost") and "Port" (containing "2222"), followed by a "Guest Login" button. Underneath, there is a "User Name" field (containing "User1"), a "Sort by client Name:" dropdown menu (set to "All"), and two buttons labeled "Connect" and "Detach". The main area of the window is a large text box displaying the following chat history: "User1: has connected.", "User2: has connected.", and "User1: Hi this is User1, How are you?". At the bottom of the window, there is a text input field for sending messages, a "SEND MESSAGE" button, and a status bar showing the username "vthorat1" in a green box.

Chat Application - Client Window

IP Address : localhost Port : 2222 Guest Login

User Name : User1 Sort by client Name: All Connect Detach

User1: has connected.  
User2: has connected.  
User1: Hi this is User1, How are you?

SEND MESSAGE

vthorat1

## Chat Application

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Chat Application - Client Window

P Address :

Port :

Jser Name :

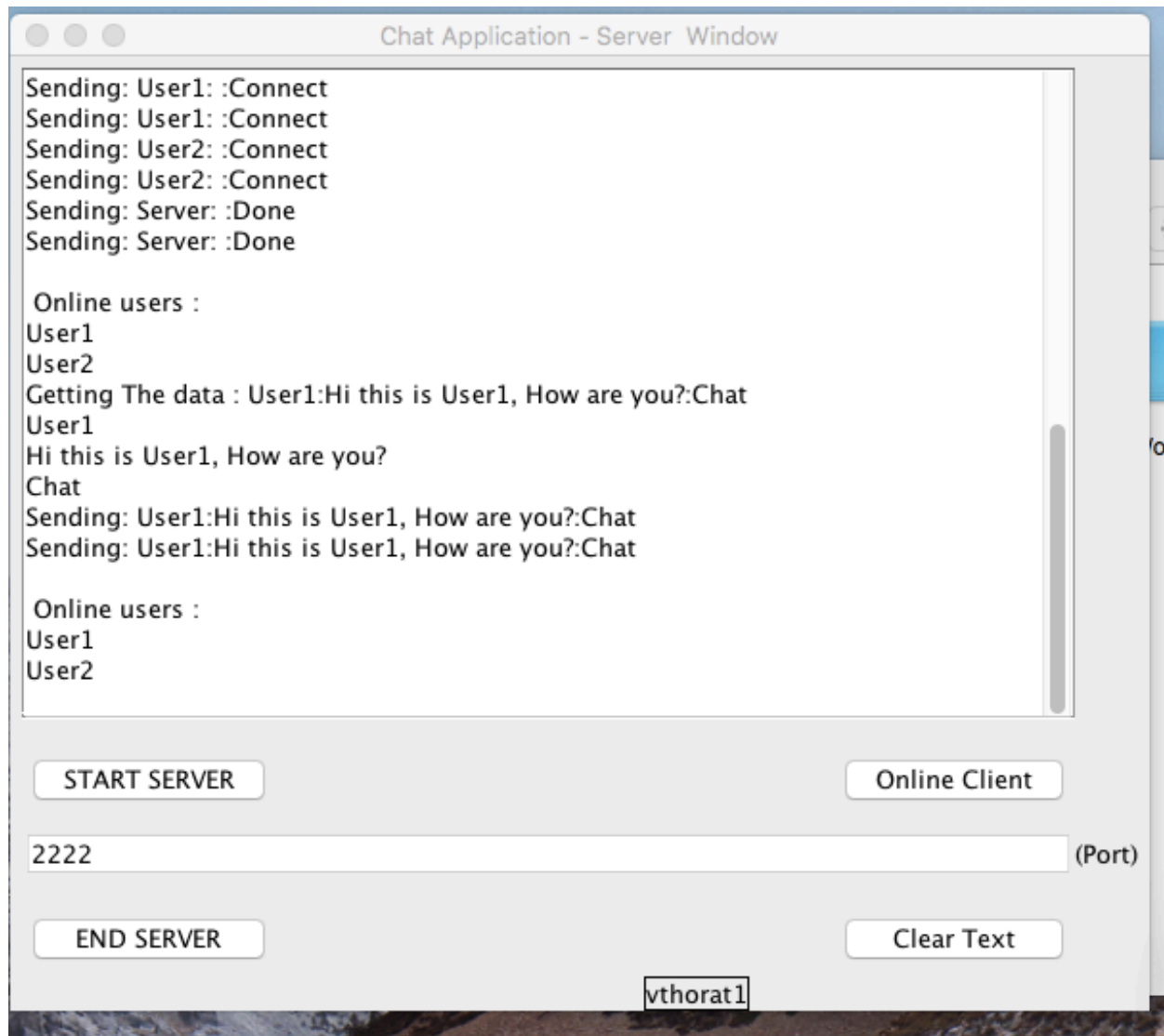
Sort by client Name:  ▾

User2: has connected.

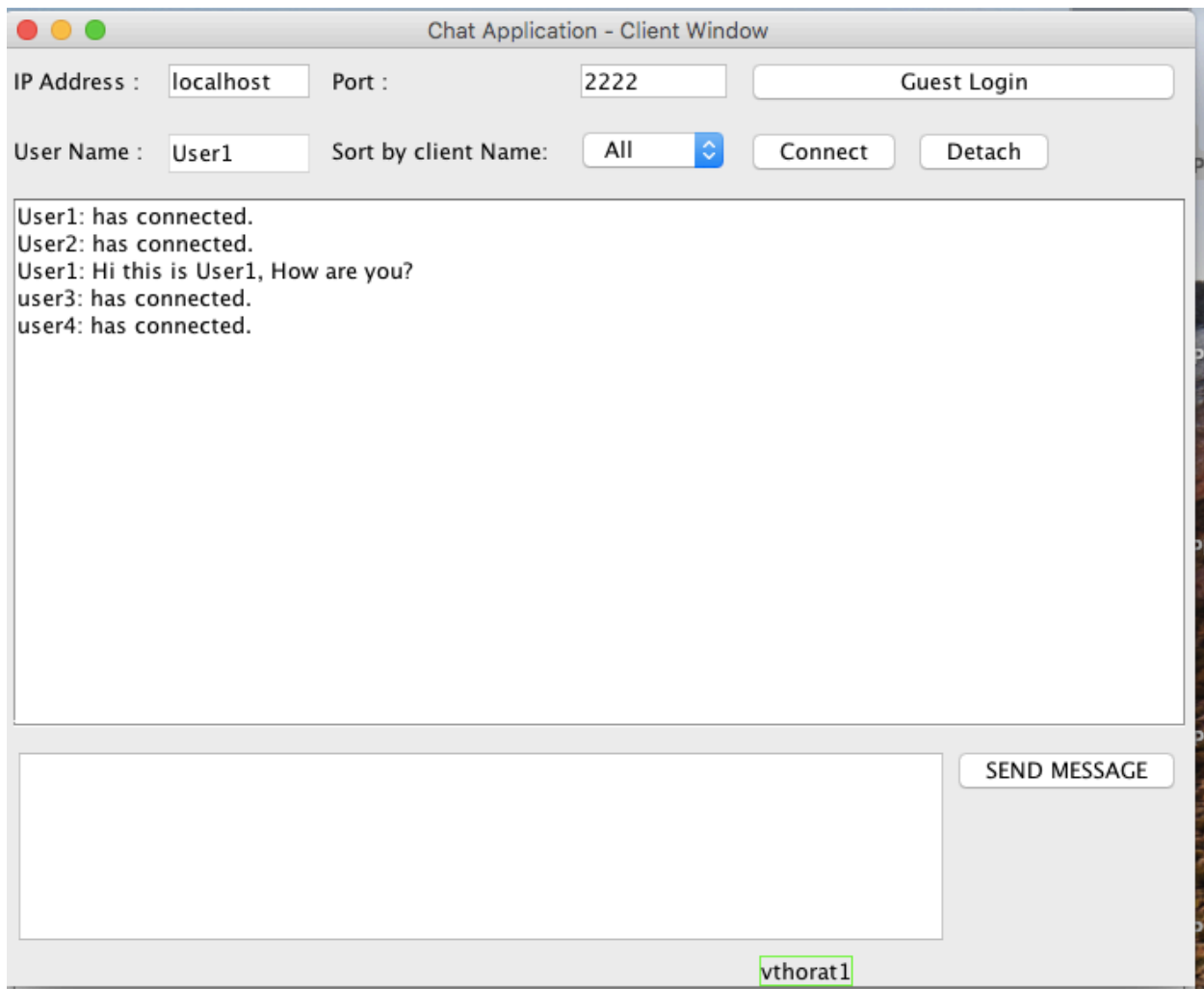
User1: Hi this is User1, How are you?

vthorat1

## Chat Application



## Chat Application



The screenshot shows a window titled "Chat Application - Client Window". It features a header area with input fields for "IP Address" (set to "localhost") and "Port" (set to "2222"), a "Guest Login" button, and a "User Name" field (set to "User1"). Below these are a "Sort by client Name" dropdown menu (set to "All"), and "Connect" and "Detach" buttons. The main area is a large text box displaying a chat log with the following messages: "User1: has connected.", "User2: has connected.", "User1: Hi this is User1, How are you?", "user3: has connected.", and "user4: has connected.". At the bottom, there is a text input field for sending messages, a "SEND MESSAGE" button, and a status bar showing the username "vthorat1".

Chat Application - Client Window

IP Address : localhost Port : 2222 Guest Login

User Name : User1 Sort by client Name: All Connect Detach

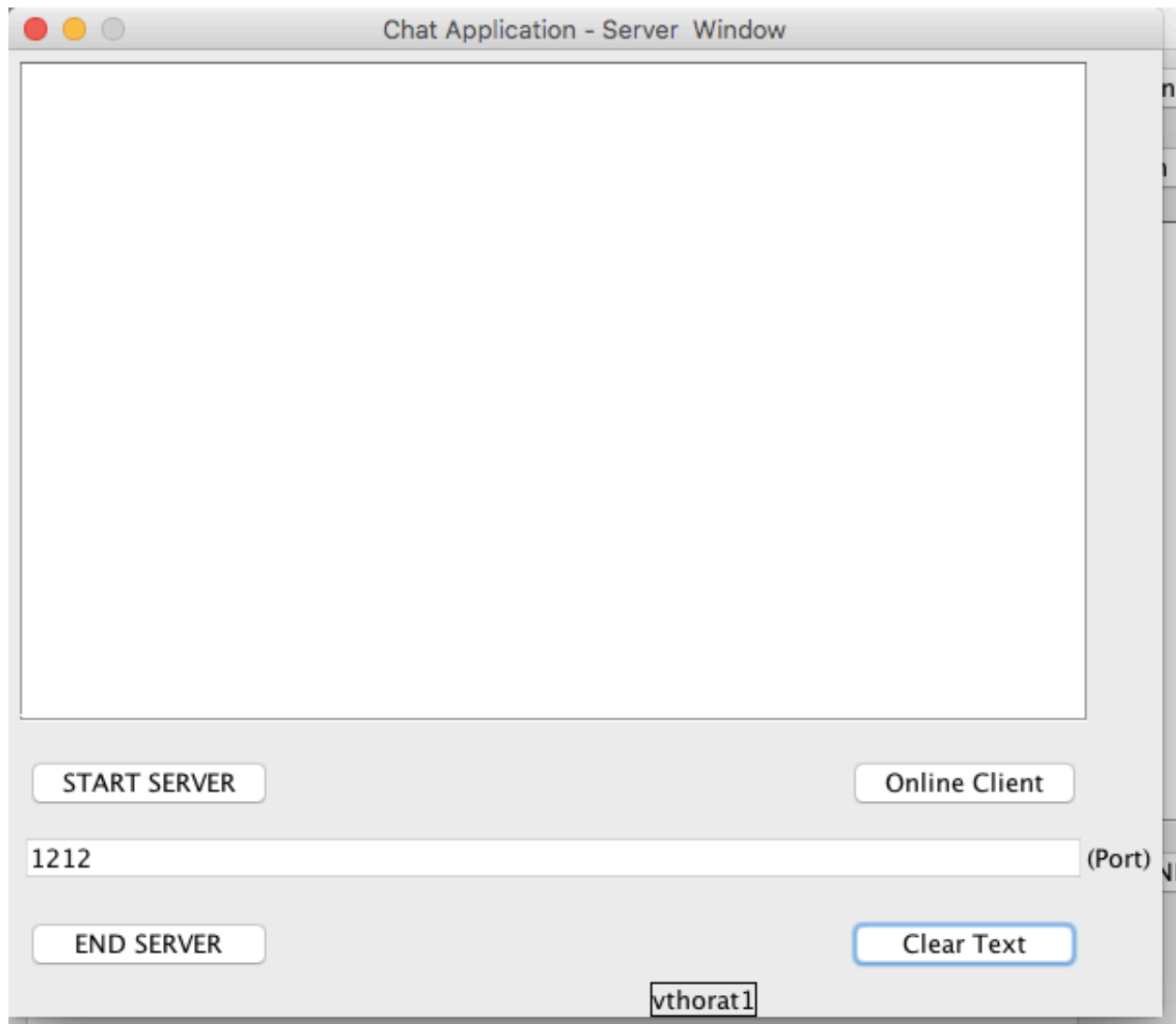
User1: has connected.  
User2: has connected.  
User1: Hi this is User1, How are you?  
user3: has connected.  
user4: has connected.

SEND MESSAGE

vthorat1

Testing with different port for server.

## Chat Application



## Chat Application

The screenshot shows a macOS-style window titled "Chat Application - Client Window". It contains several input fields and buttons for connecting to a chat server. The main area displays a log of connection attempts and messages. At the bottom, there is a text input field for sending messages and a status indicator.

IP Address :  Port :

User Name :  Sort by client Name:

Cannot Connect! Try Again, check port Number.  
test: has connected.  
test 2: has connected.  
test 2: THis is testing for error  
test 2: has disconnected.  
test this is disconnected now.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.  
You are already connected with given port.

vthorat1

## Chat Application

Chat Application - Client Window

IP Address : localhost

Port : 2222

Guest Login

User Name : Guest 333

Sort by client Name: ..

Connect

Detach

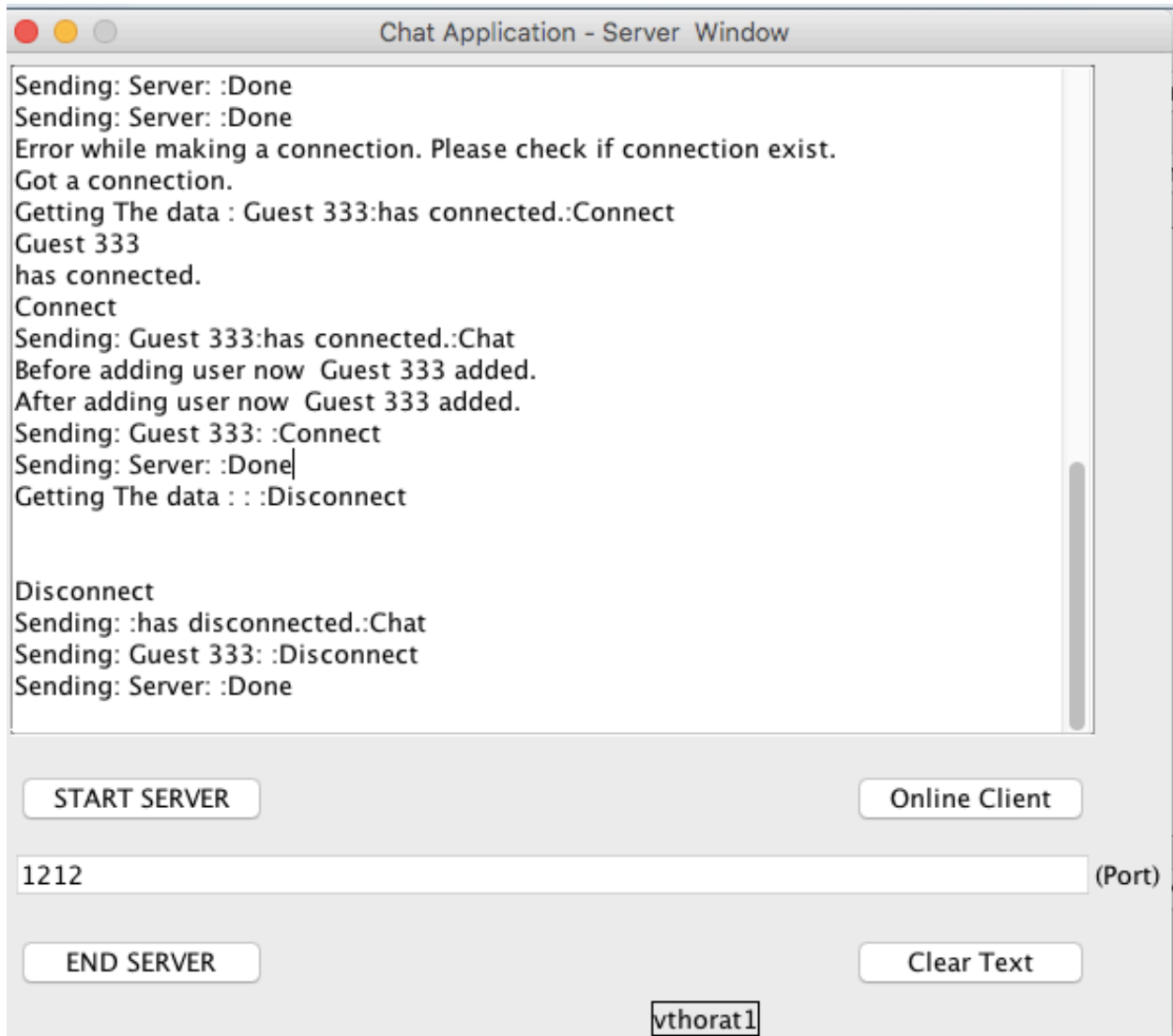
Having Issue, Cannot Connect! Try Again.  
Cannot Connect! Try Again, check port Number.  
Cannot Connect! Try Again, check port Number.

SEND MESSAGE

vthorat1



## Chat Application

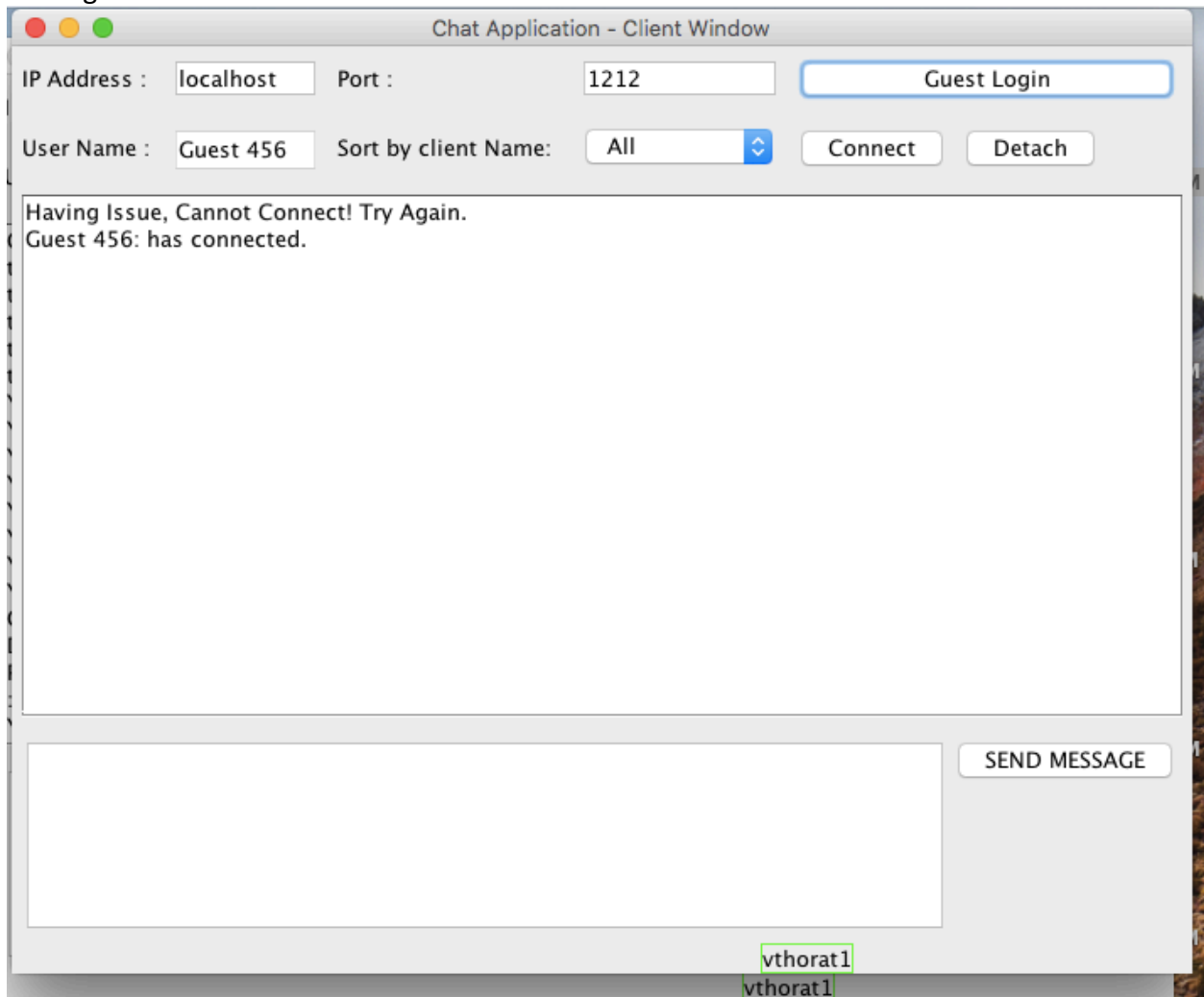


## Chat Application

Guest user also there, if some want to use login with Guest, it is also possible using this guest login button.

## Chat Application

Testing.



The screenshot shows a window titled "Chat Application - Client Window". It features a header bar with three colored window control buttons (red, yellow, green) on the left. Below the header, there are several input fields and buttons. The "IP Address" field contains "localhost", and the "Port" field contains "1212". To the right of these is a "Guest Login" button. Below the IP and Port fields, the "User Name" field contains "Guest 456", and the "Sort by client Name:" dropdown menu is set to "All". To the right of the dropdown are "Connect" and "Detach" buttons. A large text area in the center displays the message: "Having Issue, Cannot Connect! Try Again." followed by "Guest 456: has connected." Below this text area is a large empty input field for sending messages, with a "SEND MESSAGE" button to its right. At the bottom of the window, the username "vthorat1" is displayed twice, once in a green box and once in a blue box.

Chat Application - Client Window

IP Address : localhost Port : 1212 Guest Login

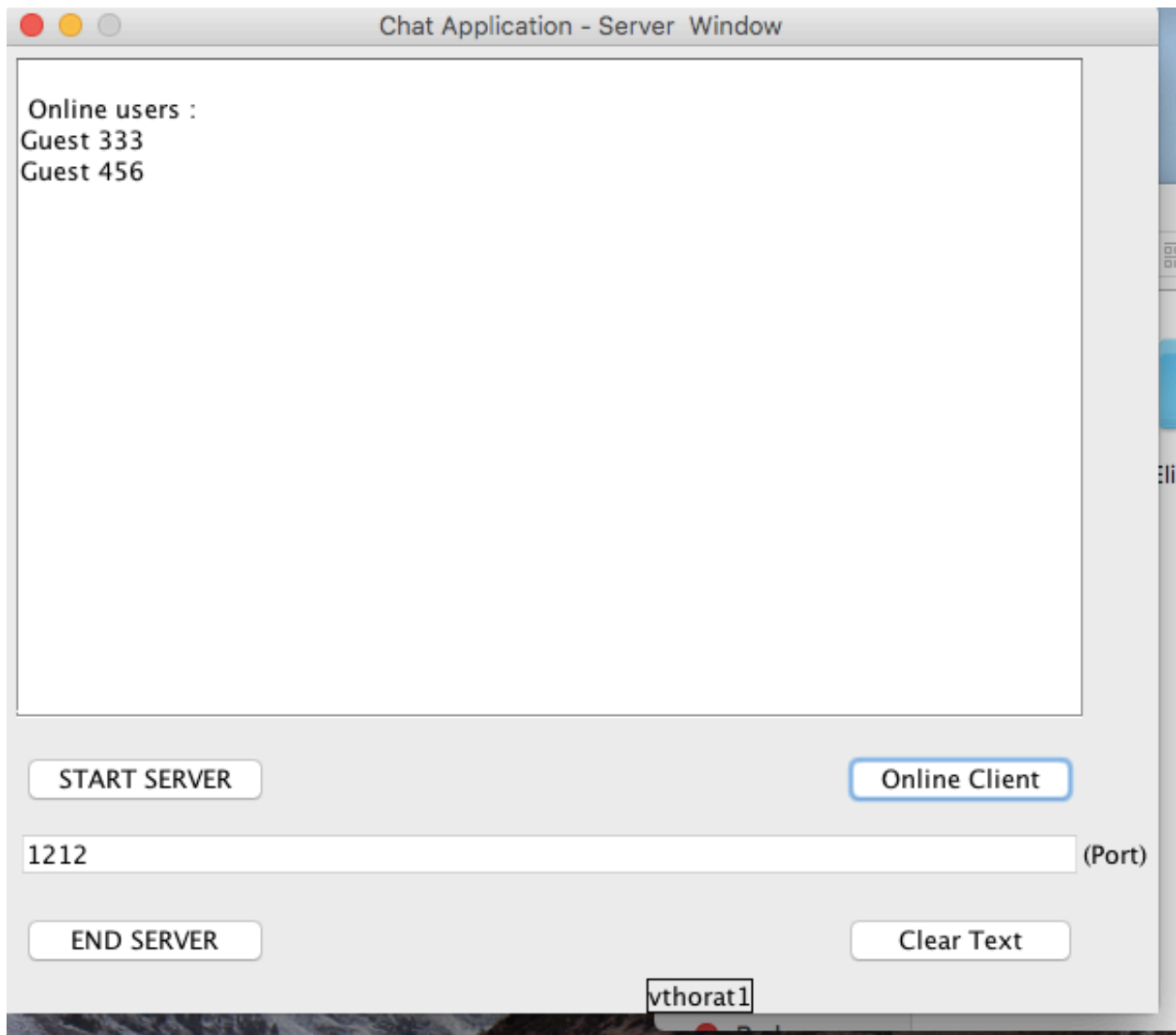
User Name : Guest 456 Sort by client Name: All Connect Detach

Having Issue, Cannot Connect! Try Again.  
Guest 456: has connected.

SEND MESSAGE

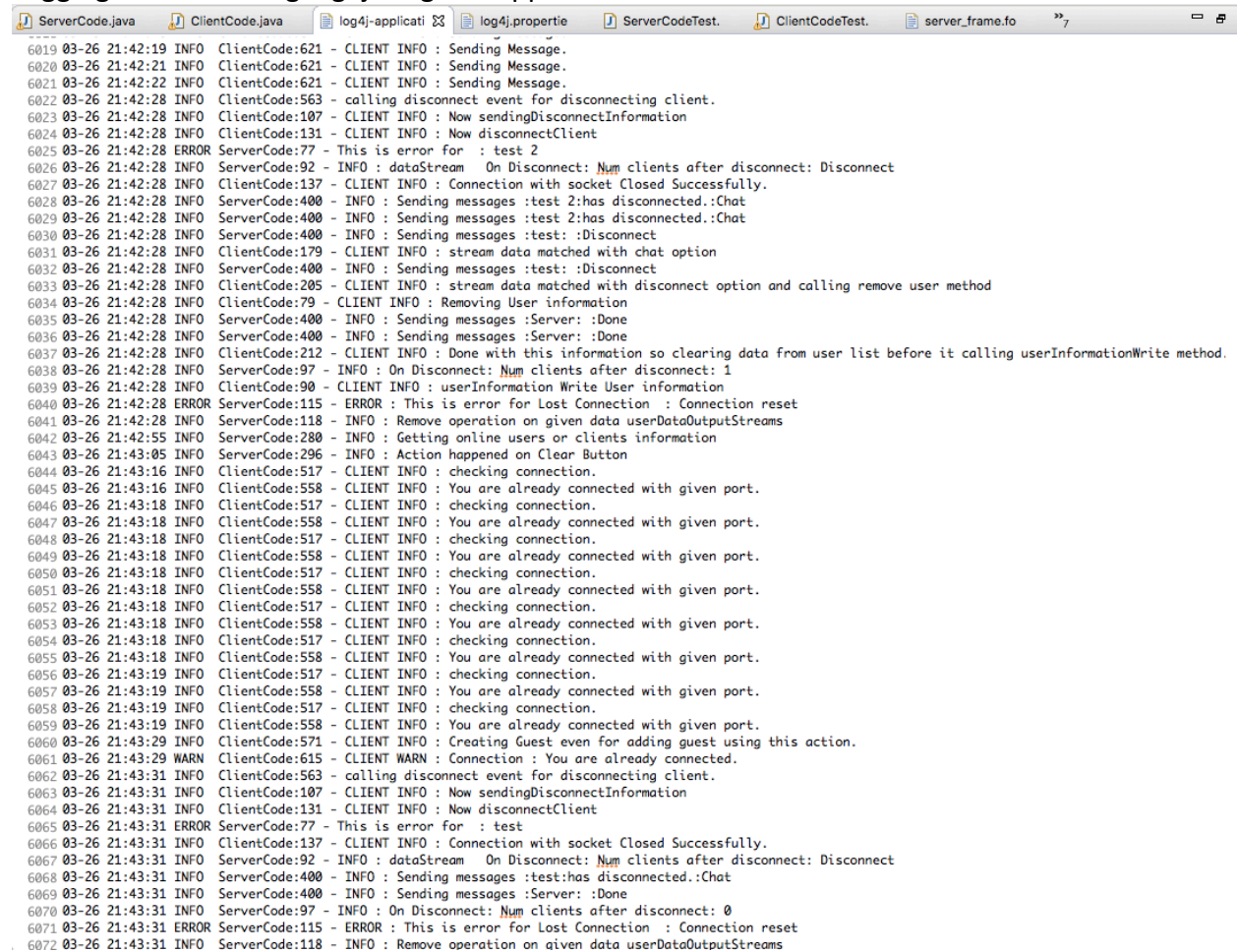
vthorat1  
vthorat1

## Chat Application



## Chat Application

Logging file after using log4j for given application....!!!!!!



The screenshot shows an IDE with several tabs open: ServerCode.java, ClientCode.java, log4j-applicati, log4j.propertie, ServerCodeTest, ClientCodeTest, and server\_frame.fo. The log4j-applicati tab is active, displaying a series of log messages. The logs are timestamped and include log levels (INFO, ERROR, WARN) and messages from both the server and client sides of the chat application. The messages describe the flow of the application, including sending messages, disconnecting clients, and handling errors.

```
6019 03-26 21:42:19 INFO ClientCode:621 - CLIENT INFO : Sending Message.
6020 03-26 21:42:21 INFO ClientCode:621 - CLIENT INFO : Sending Message.
6021 03-26 21:42:22 INFO ClientCode:621 - CLIENT INFO : Sending Message.
6022 03-26 21:42:28 INFO ClientCode:563 - calling disconnect event for disconnecting client.
6023 03-26 21:42:28 INFO ClientCode:107 - CLIENT INFO : Now sendingDisconnectInformation
6024 03-26 21:42:28 INFO ClientCode:131 - CLIENT INFO : Now disconnectClient
6025 03-26 21:42:28 ERROR ServerCode:77 - This is error for : test 2
6026 03-26 21:42:28 INFO ServerCode:92 - INFO : dataStream On Disconnect: Num clients after disconnect: Disconnect
6027 03-26 21:42:28 INFO ClientCode:137 - CLIENT INFO : Connection with socket Closed Successfully.
6028 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :test 2:has disconnected.:Chat
6029 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :test 2:has disconnected.:Chat
6030 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :test: :Disconnect
6031 03-26 21:42:28 INFO ClientCode:179 - CLIENT INFO : stream data matched with chat option
6032 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :test: :Disconnect
6033 03-26 21:42:28 INFO ClientCode:205 - CLIENT INFO : stream data matched with disconnect option and calling remove user method
6034 03-26 21:42:28 INFO ClientCode:79 - CLIENT INFO : Removing User information
6035 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :Server: :Done
6036 03-26 21:42:28 INFO ServerCode:400 - INFO : Sending messages :Server: :Done
6037 03-26 21:42:28 INFO ClientCode:212 - CLIENT INFO : Done with this information so clearing data from user list before it calling userInformationWrite method.
6038 03-26 21:42:28 INFO ServerCode:97 - INFO : On Disconnect: Num clients after disconnect: 1
6039 03-26 21:42:28 INFO ClientCode:90 - CLIENT INFO : userInformation Write User information
6040 03-26 21:42:28 ERROR ServerCode:115 - ERROR : This is error for Lost Connection : Connection reset
6041 03-26 21:42:28 INFO ServerCode:118 - INFO : Remove operation on given data userDataOutputStreams
6042 03-26 21:42:55 INFO ServerCode:280 - INFO : Getting online users or clients information
6043 03-26 21:43:05 INFO ServerCode:296 - INFO : Action happened on Clear Button
6044 03-26 21:43:16 INFO ClientCode:517 - CLIENT INFO : checking connection.
6045 03-26 21:43:16 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6046 03-26 21:43:18 INFO ClientCode:517 - CLIENT INFO : checking connection.
6047 03-26 21:43:18 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6048 03-26 21:43:18 INFO ClientCode:517 - CLIENT INFO : checking connection.
6049 03-26 21:43:18 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6050 03-26 21:43:18 INFO ClientCode:517 - CLIENT INFO : checking connection.
6051 03-26 21:43:18 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6052 03-26 21:43:18 INFO ClientCode:517 - CLIENT INFO : checking connection.
6053 03-26 21:43:18 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6054 03-26 21:43:18 INFO ClientCode:517 - CLIENT INFO : checking connection.
6055 03-26 21:43:18 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6056 03-26 21:43:19 INFO ClientCode:517 - CLIENT INFO : checking connection.
6057 03-26 21:43:19 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6058 03-26 21:43:19 INFO ClientCode:517 - CLIENT INFO : checking connection.
6059 03-26 21:43:19 INFO ClientCode:558 - CLIENT INFO : You are already connected with given port.
6060 03-26 21:43:29 INFO ClientCode:571 - CLIENT INFO : Creating Guest even for adding guest using this action.
6061 03-26 21:43:29 WARN ClientCode:615 - CLIENT WARN : Connection : You are already connected.
6062 03-26 21:43:31 INFO ClientCode:563 - calling disconnect event for disconnecting client.
6063 03-26 21:43:31 INFO ClientCode:107 - CLIENT INFO : Now sendingDisconnectInformation
6064 03-26 21:43:31 INFO ClientCode:131 - CLIENT INFO : Now disconnectClient
6065 03-26 21:43:31 ERROR ServerCode:77 - This is error for : test
6066 03-26 21:43:31 INFO ClientCode:137 - CLIENT INFO : Connection with socket Closed Successfully.
6067 03-26 21:43:31 INFO ServerCode:92 - INFO : dataStream On Disconnect: Num clients after disconnect: Disconnect
6068 03-26 21:43:31 INFO ServerCode:400 - INFO : Sending messages :test:has disconnected.:Chat
6069 03-26 21:43:31 INFO ServerCode:400 - INFO : Sending messages :Server: :Done
6070 03-26 21:43:31 INFO ServerCode:97 - INFO : On Disconnect: Num clients after disconnect: 0
6071 03-26 21:43:31 ERROR ServerCode:115 - ERROR : This is error for Lost Connection : Connection reset
6072 03-26 21:43:31 INFO ServerCode:118 - INFO : Remove operation on given data userDataOutputStreams
```

Chat Application

Source code

Please find attached folder of application.