

# **TCP Group Chat**

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## **Commands to run the application**

### **Running the server**

```
g++ tcpserver.cpp
```

### **Running the client**

```
g++ tcpclient.cpp -lpthread
```

## **Screenshots**

- 1) We activate the server. On activation the server asks us to enter the number of clients that would be involved in the chat.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
█
```

In our case we input the value of 3.

- 2) The server then asks us to enter the ip address and the port number.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
█
```

The server is now listening on port 3002.

- 3) We now activate one of the clients. We are asked to input the ip address and port number.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
█
```

- 4) After entering the ip address and port number, we are asked to enter our name.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
█
```

We give the name of the 1st client as A.

5) After entering our name we get a welcome message from the server.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
█
```

The server also adds A to our list of active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
█
```

- 6) We now activate a new client with the name B and a welcome message is sent by the server.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
█
```

The server adds B to the list of active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
█
```

The server also broadcasts the message that “B has joined the chat” to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
█
```

7) We now activate a new client C and a welcome message is sent by server.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
█
```



The server broadcasts the message that “C has joined the chat” to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
█
```

The message is received by A.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
█
```

The message is also received by B.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
█
```

8) Now a “hello” is sent by A.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
█
```

The message is received by the server and broadcasted to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
█
```

The message is received by B.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
█
```

The message is received by C.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
█
```

9) Now “hi” is sent by B.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
█
```

The message is received by the server and broadcasted to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
█
```

The message is received by A.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
█
```

The message is received by C.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
█
```

10) The client C now sends a message “How is everyone?”.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
█
```

The server receives the message and broadcasts it to all the active clients.



```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B

```

Client A receives the message.

```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?

```

Client B receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
█
```

11) Client A leaves the chat by sending a message “bye”.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?
bye
(base) shivangana@shivangana-msi:~/chatroom$ █
```

The server receives the message and notifies all the other active clients with a message "A has left the chat".

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
█
```

Client B receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
A has left the chat.
█
```

Client C receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
█
```

- 12) Client B sends the message “great” in response to client A’s earlier message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter your name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
A has left the chat.
great!
█
```

The server receives the message and broadcasts the message to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
█
```

Client C receives the message.

```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!

```

- 13) Client A rejoins the chat and again receives a welcome message from the server.

```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?
bye
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!

```

The server broadcasts the message that “A has joined the chat” to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
█
```

Client B receives the message.



```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
A has left the chat.
great!
A has joined the chat
█
```

Client C receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!
A has joined the chat
█
```

14) Client A sends the message “sorry about that guys”.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?
bye
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
sorry about that guys
```

The server receives the message and broadcasts it to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
█
```

Client B receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
A has left the chat.
great!
A has joined the chat
A>sorry about that guys
█
```

Client C receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!
A has joined the chat
A>sorry about that guys
█
```

15) Client B exits the chat by typing “bye”.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
B
Welcome to the chat server!
C has joined the chat
A>hello
hi
C>How is everyone doing?
A has left the chat.
great!
A has joined the chat
A>sorry about that guys
bye
(base) shivangana@shivangana-msi:~/chatroom$
```

The server receives the message and broadcasts a message “B has left the chat” to all the active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
Data received from B: bye
Broadcast done to A
Broadcast done to C
█
```

Client A receives the message.

```

(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?
bye
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
sorry about that guys
B has left the chat.

```

Client C receives the message.

```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!
A has joined the chat
A>sorry about that guys
B has left the chat.

```

16) Client A types in the message "bye".

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
B has joined the chat
C has joined the chat
hello
B>hi
C>How is everyone doing?
bye
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
A
Welcome to the chat server!
sorry about that guys
B has left the chat.
bye
(base) shivangana@shivangana-msi:~/chatroom$
```

The server receives the message and broadcasts it to all the active clients.



```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
Data received from B: bye
Broadcast done to A
Broadcast done to C
Data received from A: bye
Broadcast done to C
```

Client C receives the message.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!
A has joined the chat
A>sorry about that guys
B has left the chat.
A has left the chat.
█
```

17) Client C types “bye” and leaves the chat.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
C
Welcome to the chat server!
A>hello
B>hi
How is everyone doing?
A has left the chat.
B>great!
A has joined the chat
A>sorry about that guys
B has left the chat.
A has left the chat.
bye
(base) shivangana@shivangana-msi:~/chatroom$ █
```

The server receives the message but does not broadcast the message this time since there are no active clients at the moment.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
Data received from B: bye
Broadcast done to A
Broadcast done to C
Data received from A: bye
Broadcast done to C
Data received from C: bye
█
```

- 18) The server is still running so new clients can join the server. We activate a new client with the name D.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter your name
D
Welcome to the chat server!
█
```

The server accepts the client and adds it to its list of active clients.

```

(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
Data received from B: bye
Broadcast done to A
Broadcast done to C
Data received from A: bye
Broadcast done to C
Data received from C: bye
D has been added to the chat

```

19) Client D types “bye” and leaves the chat.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpclient.cpp -lpthread
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the ip address and port number of server
192.168.18.20
3002
Enter you name
D
Welcome to the chat server!
bye
(base) shivangana@shivangana-msi:~/chatroom$
```

The server receives the message but does not broadcast since there are no active clients.

```
(base) shivangana@shivangana-msi:~/chatroom$ g++ tcpserver.cpp
(base) shivangana@shivangana-msi:~/chatroom$ ./a.out
Enter the number of members in the chatroom
3
Enter the ip address and port number to listen the connections for
192.168.18.20
3002
Server listening on IP 1412a8c0:PORT 3002
A has been added to the chat
B has been added to the chat
B joining message broadcasted to A
C has been added to the chat
C joining message broadcasted to A
C joining message broadcasted to B
Data received from A: hello
Broadcast done to B
Broadcast done to C
Data received from B: hi
Broadcast done to A
Broadcast done to C
Data received from C: How is everyone doing?
Broadcast done to A
Broadcast done to B
Data received from A: bye
Broadcast done to B
Broadcast done to C
Data received from B: great!
Broadcast done to C
A has been added to the chat
A joining message broadcasted to B
A joining message broadcasted to C
Data received from A: sorry about that guys
Broadcast done to B
Broadcast done to C
Data received from B: bye
Broadcast done to A
Broadcast done to C
Data received from A: bye
Broadcast done to C
Data received from C: bye
D has been added to the chat
Data received from D: bye
```