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- Course: System Software

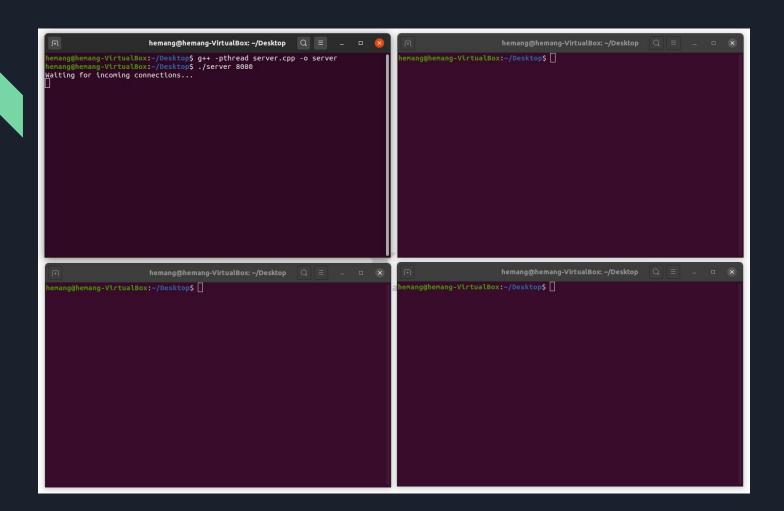
Client-Server Working Process Stream Sockets Screenshots and Explanation.

How to run the server.

In Next, page I have shown how to run server code. In command prompt go to folder where server file is placed And run the command below.

- >> g++ -pthread server.cpp -o server
- >> ./server 8080

The server is running and clients are not connected to server, so it is waiting for clients to connect.

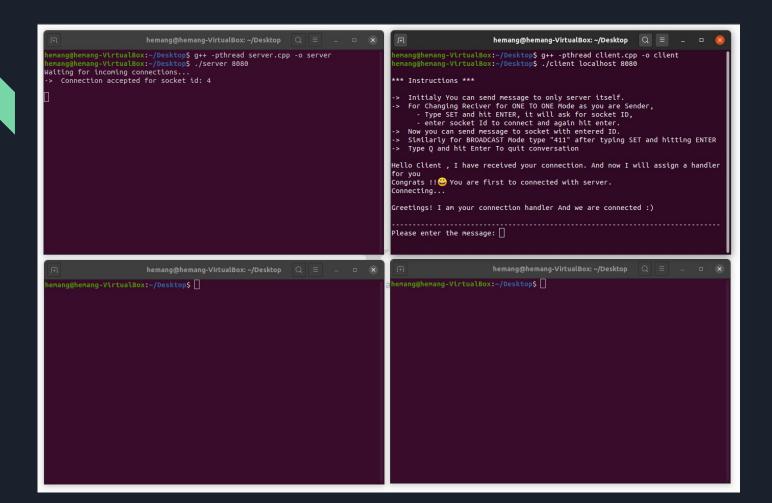


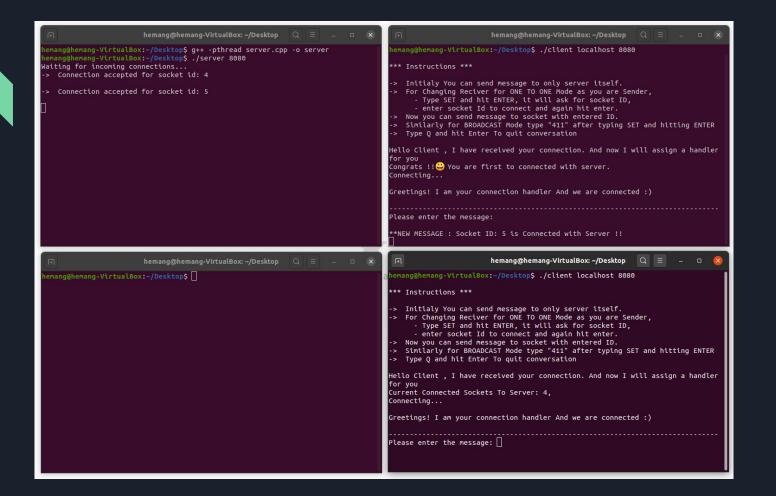
How to connect clients to the server.

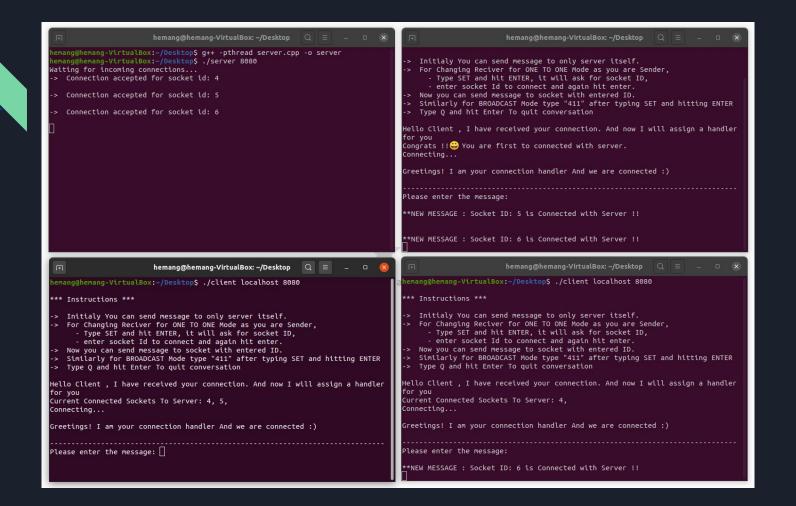
- Go to the folder in command prompt where client file is placed.
- At this point server is running and waiting for clients to connect. Now run the command below.
- >> g++ -pthread client.cpp -o client
- >> ./client localhost 8080

Similarly repeat this process for n number of clients in n different terminals.

It is shown in next 3 slide, for 3 clients. Every time new client connects to the server, it sends message to already connected clients that new client is connected with server.





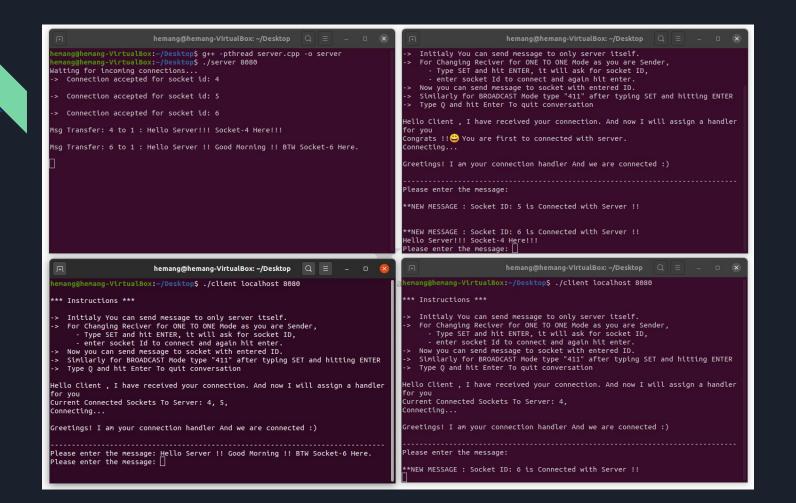


Initial communication with server.

Until now client sockets with ids 4, 5 and 6 are connected with server.

Default socket id of server is 1.

So initially clients are connected with server only so when they sends message, the message goes to server. I have shown that client sockets 4 and 6 are sending message to the server.



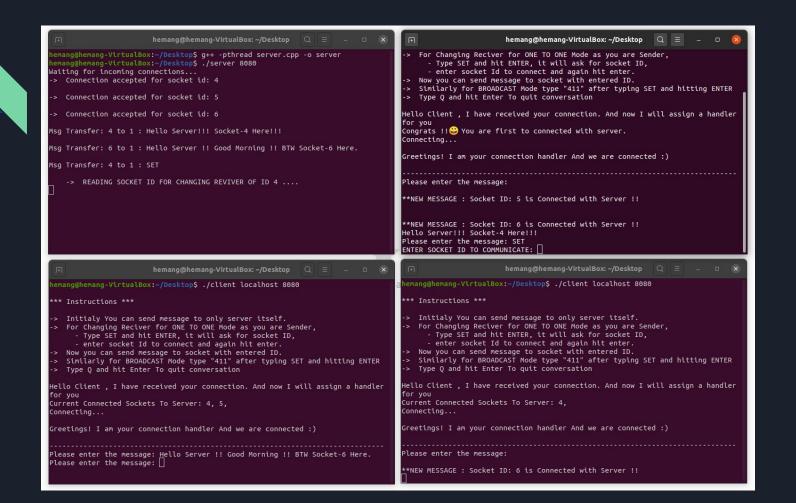
How to connect two or more clients with each other.

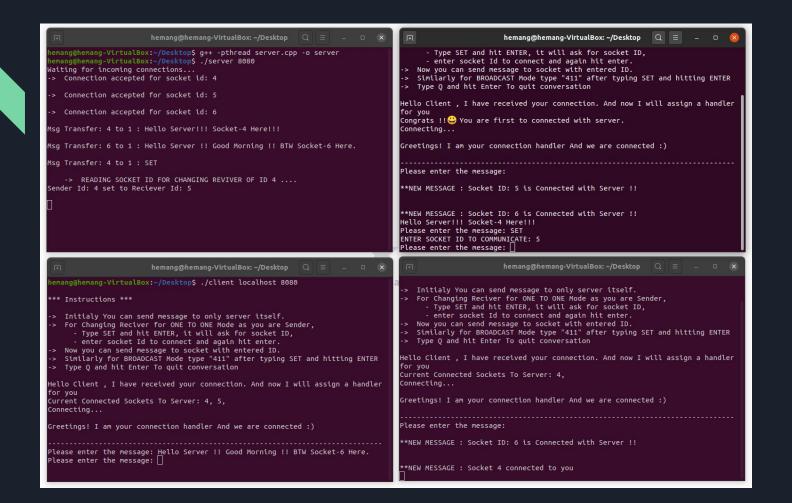
To set connection with another client, type "SET" and hit enter in any client terminal to connect it with other client

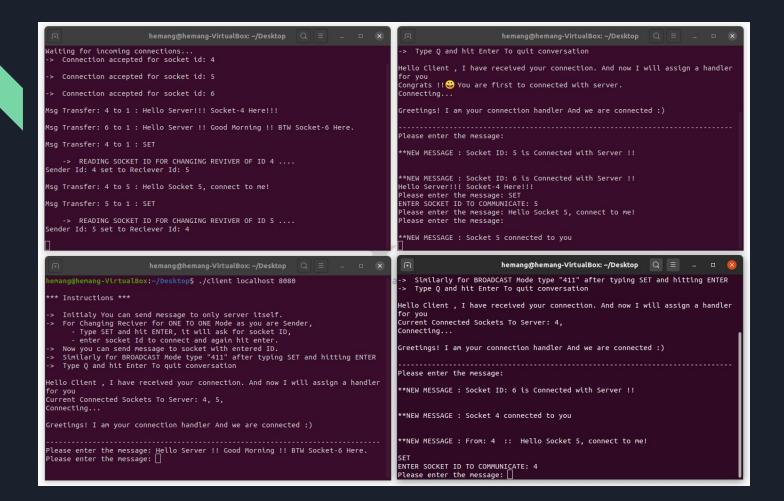
Now it will ask for socket id of another client to connect with it.

Type socket id and hit enter. Now you are connected with it. This will send message to opposite client that you are connected with it. Now whatever message you will send will go to that client through server.

This is shown in next 3 pages. Client 4 and 5 are connected with each other. We can extend it with n number of client as well.





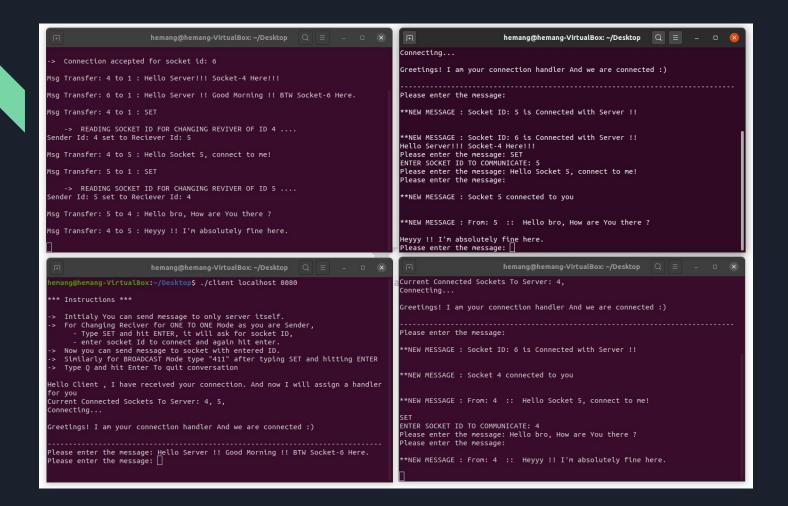


Communication between clients.

In next page client socket 4 and 5 are communicating.

We can see this messages are going through server.

Similarly if we have n clients, then they all can communicate with each other via server. This functionality is added in my code.



How to send broadcast messages.

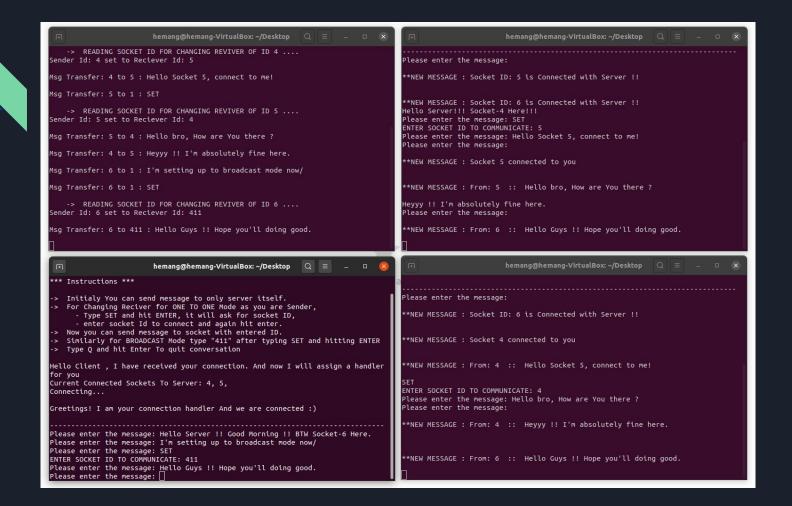
Whichever client want to send broadcast message, in that client type "SET" and hit enter. Now type "411" specific code when is asks for socket id to send broadcast messages and hit enter.

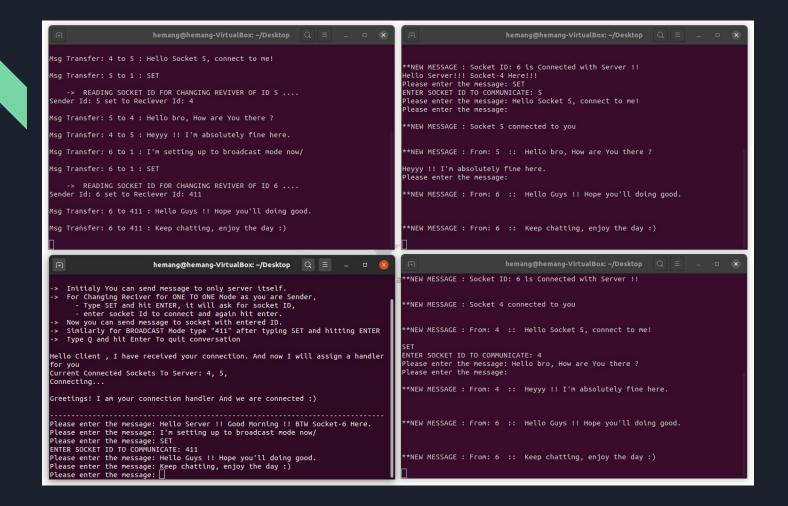
Here '4' stands for 'A' and '1' stands for 'L', so not other logic behind it, so here '411' means 'ALL'.

Now whatever message you will sent it will go to all other connected clients. Any number of clients can broadcast simultaneously. This functionality is added in my code.

In next 3 pages client socket with id 6 set to broadcast mode and sending messages to all other sockets through server.

```
hemang@hemang-VirtualBox: ~/Desktop Q = - - ×
                                                                                                         hemang@hemang-VirtualBox: ~/Desktop Q = = 0
Msg Transfer: 4 to 1 : SET
                                                                                  Connecting...
   -> READING SOCKET ID FOR CHANGING REVIVER OF ID 4 ....
                                                                                  Greetings! I am vour connection handler And we are connected :)
Sender Id: 4 set to Reciever Id: 5
Msg Transfer: 4 to 5 : Hello Socket 5, connect to me!
                                                                                  Please enter the message:
                                                                                  **NEW MESSAGE : Socket ID: 5 is Connected with Server !!
Msg Transfer: 5 to 1 : SET
   -> READING SOCKET ID FOR CHANGING REVIVER OF ID 5 ....
Sender Id: 5 set to Reciever Id: 4
                                                                                  **NEW MESSAGE : Socket ID: 6 is Connected with Server !!
                                                                                  Hello Server!!! Socket-4 Here!!!
Msg Transfer: 5 to 4 : Hello bro, How are You there ?
                                                                                  Please enter the message: SET
                                                                                  ENTER SOCKET ID TO COMMUNICATE: 5
Msg Transfer: 4 to 5 : Heyvy !! I'm absolutely fine here.
                                                                                  Please enter the message: Hello Socket 5, connect to me!
                                                                                  Please enter the message:
Msg Transfer: 6 to 1 : I'm setting up to broadcast mode now/
                                                                                  **NEW MESSAGE : Socket 5 connected to you
Msq Transfer: 6 to 1 : SET
   -> READING SOCKET ID FOR CHANGING REVIVER OF ID 6 ....
                                                                                  **NEW MESSAGE : From: 5 :: Hello bro, How are You there ?
Sender Id: 6 set to Reciever Id: 411
                                                                                  Heyyy !! I'm absolutely fine here.
                                                                                  Please enter the message:
                       hemang@hemang-VirtualBox: ~/Desktop Q =
                                                                                                         hemang@hemang-VirtualBox: ~/Desktop Q = _ □ ×
                                                                                  Current Connected Sockets To Server: 4.
                                                                                  Connecting...
*** Instructions ***
                                                                                  Greetings! I am your connection handler And we are connected :)
-> Initialy You can send message to only server itself.
-> For Changing Reciver for ONE TO ONE Mode as you are Sender.
     - Type SET and hit ENTER, it will ask for socket ID,
     - enter socket Id to connect and again hit enter.
                                                                                  Please enter the message:
-> Now you can send message to socket with entered ID.
-> Similarly for BROADCAST Mode type "411" after typing SET and hitting ENTER
                                                                                  **NEW MESSAGE : Socket ID: 6 is Connected with Server !!
-> Type Q and hit Enter To quit conversation
Hello Client , I have received your connection. And now I will assign a handler
                                                                                  **NEW MESSAGE : Socket 4 connected to you
for you
Current Connected Sockets To Server: 4. 5.
Connecting...
                                                                                  **NEW MESSAGE : From: 4 :: Hello Socket 5, connect to me!
Greetings! I am your connection handler And we are connected :)
                                                                                 ENTER SOCKET ID TO COMMUNICATE: 4
                                                                                  Please enter the message: Hello bro, How are You there ?
                                                                                 Please enter the message:
Please enter the message: Hello Server !! Good Morning !! BTW Socket-6 Here.
Please enter the message: I'm setting up to broadcast mode now/
Please enter the message: SET
                                                                                  **NEW MESSAGE : From: 4 :: Hevvv !! I'm absolutely fine here.
ENTER SOCKET ID TO COMMUNICATE: 411
Please enter the message:
```





How to terminate client.

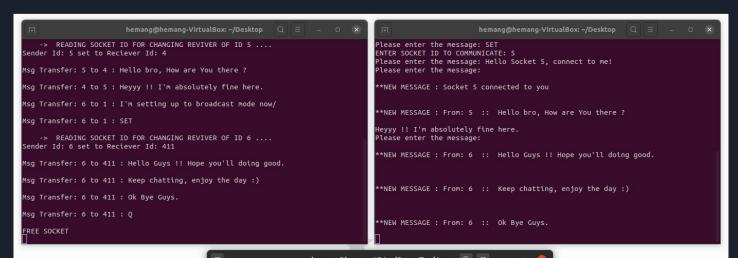
We can simply type 'Q' and hit enter to terminate client.

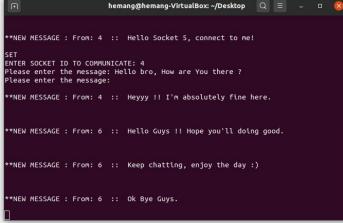
Or Press CTRL+C.

Or Close terminal directly.

When any client disconnects server will Free that socket, and will display message "Free Socket".

Here in next page client socket id 6 disconnected after entering 'Q'.





What if server disconnects?

We can close server by just pressing CTRL+C or closing terminal directly.

By doing this all connected clients will also terminate itself because they can't connect without server anymore.

And at the moment server disconnects, Client terminal shows message "SERVER CLOSED!!" and stop running program anymore.

Here in next 2 pages this is shown. I have closed server terminal directly by clicking on 🚫



That's all. We can play again like this with server and clients, by running them again.

