Simple Peer-Peer Chat Application

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Running-
A makefile has been provided with the code

Commands to compile-

$make

It compiles as follows-
g++ -pthread -w -o server server.cpp
g++ -pthread -w -o client client.cpp

The code can run both locally and globally.

Server-
The server starts at port 4201 on the host PC. It can be accessed by the PC's IP address or 127.0.0.1 if the server is on local host.
The server creates a maximum of 20 threads to deal with the clients on a separate ports.So the clients can interact simultaneously without any hiccup with the server.
To run the server you can type-

$./server

Client-
The client asks about the server's IP address. This is 127.0.0.1 if the client is local or the IP address of the computer in which client is running.
Next the user has to enter an idle port(on which no socket is running).If the socket is invalid or another program is using the socket it shows “bind error”.If the IP:PORT has already been registered by the server then it terminates then and there.
To run client type-

$./client

Messaging Format-
The clients can enter maximum of 256 character **except '#'**.The message terminates on newline .If the users have to disconnect then they have to type exit() only.If the other client disconnects the the present client will have to type astray message to get out of chat mode.

The code can run globally and locally(provided the ports are unique)

NOTE:
The client requesting connection will be blocked until his/her connection gets accepted or rejected

SERVER -CLIENT INTERACTION

Part 1-Sending clients a list of available peers.

SERVER-

arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./server

Socket created
Connection accepted
Connection accepted
Sending 127.0.0.1:9044

to
127.0.0.1:2222
Sending 127.0.0.1:2222

to
127.0.0.1:9044
127.0.0.1:9044 has disconnected
Sending None

to
127.0.0.1:2222
127.0.0.1:2222 has disconnected

CLIENT 1

arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./client
Enter Server IP
127.0.0.1
Connecting to server
Enter Your listening port
Warning:Use an unused port(>1024)
9044
Creating Listen Socket for peer interaction
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
127.0.0.1:2222
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
3

CLIENT 2

arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./client
Enter Server IP
127.0.0.1
Connecting to server

Enter Your listening port
Warning:Use an unused port(>1024)
2222
Creating Listen Socket for peer interaction
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
127.0.0.1:9044
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
None
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
3

Part 2-Client Client Chatting
SERVER-
arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./server

Socket created
Connection accepted
Connection accepted
Sending 10.11.10.60:4444

to
10.11.10.60:4445
Sending 10.11.10.60:4445

to
10.11.10.60:4444
10.11.10.60:4445 is now chatting
10.11.10.60:4444 is now chatting
10.11.10.60:4444 is now available
10.11.10.60:4445 is now available
10.11.10.60:4444 has disconnected
10.11.10.60:4445 has disconnected

CLIENT 1-
arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./client
Enter Server IP
10.11.10.60
Connecting to server
Enter Your listening port
Warning:Use an unused port(>1024)
4444
Creating Listen Socket for peer interaction
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are

10.11.10.60:4445

Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
2
Checking Listen port for incoming connections
If you still want to connect to a peer enter 1
Else enter any other number
1
Enter the peer ip:
10.11.10.60
Enter the peer port:
4445
Connecting to 10.11.10.60:4445
Enter message no 1:Newline for terminating message,'exit()' to disconnect
Enter message no 2:Newline for terminating message,'exit()' to disconnect
i am fine
Enter message no 3:Newline for terminating message,'exit()' to disconnect
thank you very much
Enter message no 4:Newline for terminating message,'exit()' to disconnect
exit()
Sending Thread Closed
Receiving Thread Closed
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
3

All the client messages are redirected to a file whose name is same as the port entered by the client .This is done because the simultaneously received messages cannot be redirected to stdout which creates an unexpected behaviour .If we create some kind of lock then the duplexity of the chat is not maintained .Also each message has a a time stamp thus showing that it is simultaneous(Since the send and receive are run on different threads and are non-blocking)

So the CLIENT1 received file 4445 is as follows-

Wed Feb 19 18:23:43 2014

1 was received and displayed successfully Wed Feb 19 18:23:44 2014

hi zuzu
Wed Feb 19 18:23:57 2014

how are you
Wed Feb 19 18:24:02 2014

2 was received and displayed successfully Wed Feb 19 18:24:10 2014

3 was received and displayed successfully Wed Feb 19 18:24:16 2014

CLIENT 2-
arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./client
Enter Server IP
10.11.10.60
Connecting to server
Enter Your listening port
Warning:Use an unused port(>1024)
4445
Creating Listen Socket for peer interaction
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
10.11.10.60:4444

Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
2
Checking Listen port for incoming connections
selectserver: new connection from 10.11.10.60 on socket 5
Enter 1 to accept
1
Enter message no 1:Newline for terminating message,'exit()' to disconnect
Enter message no 2:Newline for terminating message,'exit()' to disconnect
hi zuzu
Enter message no 3:Newline for terminating message,'exit()' to disconnect
how are you
Enter message no 4:Newline for terminating message,'exit()' to disconnect
Receiving Thread Closed
sdsadsa
Sending Thread Closed
If you still want to connect to a peer enter 1
Else enter any other number
2
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
3

CLIENT 2 4445 file-

Wed Feb 19 18:23:44 2014

1 was received and displayed successfully Wed Feb 19 18:23:44 2014

2 was received and displayed successfully Wed Feb 19 18:23:58 2014

3 was received and displayed successfully Wed Feb 19 18:24:03 2014

i am fine
Wed Feb 19 18:24:09 2014

thank you very much
Wed Feb 19 18:24:15 2014

Some Errors and Bugs-
ERRORS

1)
arsenal@arsenal-Dell-System-XPS-L502X:~/11010166$ ./client
Enter Server IP
10.11.10.60
Connecting to server
Enter Your listening port
Warning:Use an unused port(>1024)
2222
Your IP:PORT already in use
Terminating connection

If the port is already bounded by another socket.

2)
Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
10.11.10.60:2222

Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
2
Checking Listen port for incoming connections
If you still want to connect to a peer enter 1
Else enter any other number
1
Enter the peer ip:
10.11.10.60
Enter the peer port:
2222
Connecting to 10.11.10.60:2222
connect: Connection refused
connection error

If the client tries to connect to another client which has just left the server.Refresh the list to see that it is unavailable.

Enter 1 for peer-list,2 to connect to a peer,3 to disconnect
1
The list of available peers are
None

BUGS-

1)
If the clients disconnect without typing the exit() message then the output is unexpected.

2)
If the list is not refreshed and the client tries to connect to another client who is busy then the socket gets blocked until the busy client is done with his conversation.

3)
Sometimes some garbage value might get printed in the received file.

4)
There is no checking if the desired number of bytes have reached the client.