

README: TCP Client Server communication

SCOPE:

Using C/C++ design a simple socket server that will achieve the following goals:

- 1) Host a TCP server on port 5000
- 2) Accept all incoming connections and maintain them until a close event is received
- 3) On receipt of a "Close" event only the active socket should be disconnected
- 4) If the server has not received a message in 30 seconds from a client it should terminate that connection
- 5) If the server receives 10 messages (excluding "Heartbeat") from a single client it should consider that connection complete and disconnect
- 6) On receipt of an "Exit" should stop listening to the port and terminate the app.
- 7) Should compile on a LTS version of ubuntu (preferably 18.04) but code should support a quick port to a new network stack.

Using C/C++ design a simple socket client that will achieve the following goals:

- 1) Establish a TCP connection to a local server on port 5000
- 2) The client should maintain the connection and allow the following actions on command:
 - a) send a "Close" event to the socket
 - b) send a custom string to the socket ie "Hello World"
 - c) enter persist mode where it will send a new "Heartbeat" message every 15 seconds so the socket doesn't close
- 3) Should compile on a LTS version of ubuntu (preferably 18.04) but code should support a quick port to a new network stack.

ASSUMPTIONS & CONSTRAINTS:

Due to unavailability of specified flavor of Linux, development is done on windows platform using windows related libraries. However, the same logic can be ported using corresponding libraries in Linux.

DELIVERABLE DETAILS:

PLATFORM: Microsoft Visual C++ 2017

Folder structure:

- **“ServerApplication”** : server related source code



“ConsoleApplication1.sln” will open the project

“ConsoleApplication1.exe” will run the executable

“ConsoleApplication1.cpp” file at **“ServerApplication\ConsoleApplication1”** location is the server source code

- **“ClientApplication”** : Client related source code



“ConsoleApplication1.sln” will open the project

“ConsoleApplication1.exe” will run the executable

“ClientApplication.cpp” file at **“ClientApplication\ConsoleApplication1”** location is the client source code

How to run:

- Run the server exe before the client
- As the client runs on the same system, so local IP address has been used for client socket creation.

So below ip address need to modify accordingly in the client code -

```
server.sin_addr.s_addr = inet_addr("192.168.1.8"); //local ip address
```

Please note the following has been done in the codebase in order to keep simple

- For client the custom string "Hello World" is sent with the "HeartBeat" message every 15 seconds
- "Close", "Exit", and "Heartbeat" messages are sent from single client with some basic case dependent logic

KNOWN ISSUES:

The requirement "If the server has not received a message in 30 seconds from a client it should terminate that connection" is outstanding the implementation and can be improved with the whole application further.

REFERENCE:

- <https://www.binarytides.com/winsock-socket-programming-tutorial/>
- <https://www.installsetupconfig.com/win32programming/windowsocketwinsock214index.html>
- <https://docs.microsoft.com/en-us/windows/win32/api/winsock2/nf-winsock2-select>
- <https://docs.microsoft.com/en-us/windows/win32/winmsg/using-timers>