**Multi threaded multiclient TCP- UDP client server programming in Python with network parameter testing feature**

**The source code of the program could be found in:** [**https://github.com/farzamhm/clientserver/tree/master/UDP%20-TCP%20PYTHON%20-mulltithreading%20multiple%20client-testing**](https://github.com/farzamhm/clientserver/tree/master/UDP%20-TCP%20PYTHON%20-mulltithreading%20multiple%20client-testing) **address.**

**Based on the need and the conditions of the project the client sides send their data over a UDP socket to server side. The procedure will be done on a single thread on both sides (client and server). In other words, on the server side, one UDP socket on a single thread is initiated to listen to all the messages coming from all clients.**

**To give a further clarification about codes, Msgpack library is used to for binary serialization of data that will be sent on UDP port.**

**However, regarding the need of having a reliable transmission, the server side will send its data(orders) to its entire clients on a TCP connection. For every TCP connection between client and server an independent thread will be initiated.**

**In this part of the program, the server starts listening on a specific TCP port to accept any coming TCP connection request from client side. After establishing the connection, a thread with corresponding information related to that specific client will be created and started on the server side.**

**The program on the server side has the capability to accept more coming TCP connection from other clients and starts a new thread for each one of them.**

**TESTING NETWORK PARAMETRE:**

**Before starting the main part of the program, which was mentioned above, the program from both client and server sides will run a TCP delay test to evaluate the condition of the channel from both sides. These test results will be used later in determining the program functionalities.**

**In addition, the amount of jitter and packet loss are being calculated during main program run on the server side for each UDP connection. The test results will be stored on individual CSV sides in the program directory.**

**Other programs:**

**Some other python files are also available in the mentioned GitHub link which provide functions to determine wireless link strength for both Windows and Linux based machines.**

**Summery:**

**On the client side and during testing phase, only one TCP thread is running. And after testing TCP round trip delay parameter is finished the UDP thread also starts performing and sending UDP messages to clients. Therefore, two threads are running on this state.**

**During testing phase on the server side, the UDP thread is initiated and are listening for any UDP transmission from any of the clients. But before starting the TCP transmission (from server to any client) and after accepting TCP connection, TCP round trip delay testing is performed. Then during main cycle of the program, in the server program one UDP thread and equal to the number of the clients, TCP thread are also created and running.**