

Assignment A6

Problem Statement:

Write a program using TCP socket for wired networking for following Calculator (Arithmetic). C/C++

Objectives:

- 1) To understand TCP sockets using C/C++.
- 2) Understand wired networking.

S/W & H/W requirements:

Ubuntu

code editor / VS code

gcc compiler

Theory:

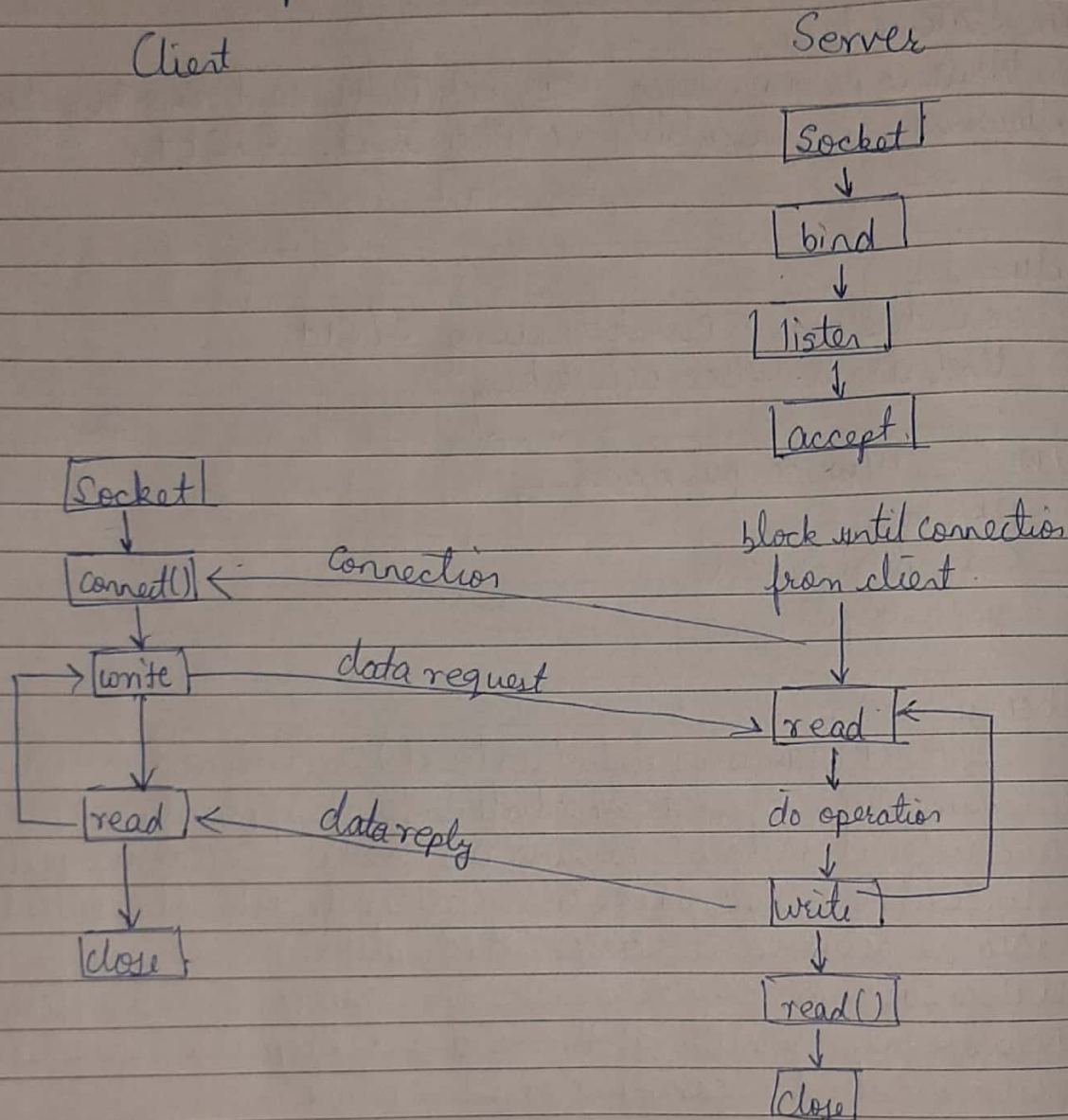
A TCP (Transmission control protocol) is a connection-oriented communication. It is intermediate layer of application layer and internet protocol layer in OSI model. TCP is designed to send the data packets over the network. It ensures that data is delivered to correct destination.

TCP creates a connection between source & destination node before transmitting the data and keep the connection alive until the communication is active.

In TCP before sending the data it breaks the large data into smaller packets and cares the integrity of the data at the time of reassembling at the destination node.

TCP also offers facility of retransmission when a TCP client sends data to the server, it requires an acknowledgment in return. If an acknowledgment is not received, after certain amount of time transmitted data will be lost & TCP automatically retransmits the data.

The communication over the network in TCP/IP model takes place in form of a server-client architecture



Steps to create a client using TCP/IP API

- 1) Create a socket using the `socket`.
- 2) Initialize the socket address structure as per the server and connect the socket to the address of server using `connect`.
- 3) Receive & send the data using the `recv()` and `send` functions. Close the connection by calling the `close` function.

Steps to create a server using TCP/IP API

- 1) Create a socket using the `socket()` function in C
- 2) Initialize the socket address structure and bind the structure to an address using `bind()`.
- 3) Listen for connections with `listen()` function
- 4) Accept a connection with `accept` function system call. This block until a client connect to the server.
- 5) Receive & send data by using `recv()` & `send()` function in C.
- 6) Close the connection by using `close()` function.

Conclusion:

From this assignment we were able to implement / understand the concept of UDP & here implemented the calculator (arithmetic) in which computation takes place on server.

