**Socket-Programming**

Socket programming is a way of connecting two nodes on a network to communicate with each other. One socket(node) listens on a particular port at an IP, while other socket reaches out to the other to form a connection. Server forms the listener socket while client reaches out to the server.

**Socket Programming in C**

Socket programming can be connection-oriented or connection-less. SOCK\_STREAM is used for connection-oriented socket programming and SOCK\_DGRAM is used for connection-less socket programming. In this case, we are using stream socket “SOCK\_STREAM”. The client in socket programming must have the following information:

IP Address of Server

Port number

**Flow Chat**

Diagram

Description automatically generated

**Operating System**

We test run this application on three different x64 architecture operating systems (virtual machines). The server runs on Ubuntu 22.04 version while the clients run on Kali Linux 2022.4. which gave the clients flexibility of a parallel download of files.

**Compiler**

We used gcc compiler in compiling the code on both client and server end. GCC is a short of GNU Compiler Collection, a C compiler for Linux.

• gcc filename.extention -o(output file) executable

**Directory Structure**

**Server-Side**: We used 8090 port number for the communication between the client and server. You may also choose any other port number above 1024, this is mainly to avoid input error.

In the directory where server.c is present, compile and then run as follows:

gcc servertel.c -o server

./server 8000

**Client-Side:** We passed the server IP address and the specified port number on the two client machine. Here, we are using "192.168.56.101" because that is our server ip address and “8000” is the specified port on the server.

In the directory where client.c is present, compile and then run as follows:

Client 1:

gcc client.c -o client

./client 192.168.56.101:8000/files/1GB.bin

Client 2:

gcc client.c -o client

./client 192.168.56.101:8000/files/5MB

The client code/file can be duplicated depending on the number of clients.

**Problem**

The server and client are two different programs that are run in different directories.

The client will create a connection to the server and send requests to download files to the client directory. It will write the files into its own directory.

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| --- | --- | --- |
| Student Name | File Name | Line Number |
| Taofeek Agboola | Servertel.c  Clientel.c | 49 - 97  12-21, 51 - 75 |
| Oluwatosin Yusuf | Servertel.c  Clientel.c | 1 – 48,  23 – 50, 1 - 10 |