Assignment 1: TCP Socket Programming

Assignment Goals

1. Enhance understanding of the TCP protocol through socket programming;

2. Gain first hand experience with setting up a TCP connection, and using it to support simple network applications.

Background

To better understand how the client and server communicate and how a TCP connection is established, it is helpful to familiarize yourself with the SOCKET tool.

A socket is connection point (endpoint) that you can name and address in a network. Socket programming allows us to use socket APIs to establish a logical communication link between remote and local processes[1]. There are definitions for SOCKET in both windows and linux environments, and you can directly call socket functions through programming languages such as C and Python.

Through socket programming, we can set up a server process and a client process, and a TCP connection between them, for them to transmit data to each other. Towards that goal, it is necessary to learn how to use sockets and its built-in functions.

Task – Design an online "guess the number" game

1. **Build a server process and a client process** (It is recommended that you print related information, such as port number, server successfully established).

2. At the server side, generate a random integer within a range as the hidden target. At the client side, use a loop to keep prompting the user to guess the number. Set some reminder rules in your server. For example, when the number entered by client is greater than target, the server will send corresponding information to the client. If client guesses the number correctly, the server transmits the recorded times of attempts back to the

client and closes the socket link.

3.**Try your game** and **draw a brief flowchart** describing how your client and server work and interact with each other.

Optional

1.Add or change any rules you like to make the game more interesting (For example, your server only has a certain probability of telling the truth).

2.Ask your classmates to play your game. You act as the server to set the number and your classmates act as the client to guess the number. Keep track of how many times they try and vice versa.

Submission

※ OS: Ubuntu/Linux/MacOs/.

※ Programming language : C/C++/python3.

※ Submit your source code and binary, as well as a document (pdf) describing how to compile and run your program. Briefly describe and analyze the output. Compress all files into zip/rar/7z, and submit through Web Learning (网络学堂).

Due date

Friday March 29, 10pm Beijing time.

Reference

[1]https://www.ibm.com/docs/en/i/7.1?topic=communications-socket-programming