בס"ד

מטלה 3 מערכות הפעלה
מגישות: רננה תורג'מן ותמר בר אילן

PART A:

In this part we implement a chat cmd tool that can send messages over the network, to the same tool ,listening on the other side, and get the response, so there will be 2 sides communication . the communication is using IPv4 TCP protocol

Usage

For run this tast first run the command make all
The client side: stnc -c IP PORT
The server side:stnc -s PORT

How it works

The program uses sockets to establish a connection between the server and the client. Once a connection is established, the program uses the poll() system call to monitor two sockets: one for input from the client, and one for input from the server. When the user types a message and hits enter, the program sends the message to the server. When the server receives a message, it sends it back to the client. Both the client and the server display the messages they receive from the other side.

Running

```
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234
send first message
send second message
Server: got two messages
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -s 1234
Client: send first message
Client: send second message
got two messages
```

PART B:

STNC is a network performance test utility that can measure the time it takes to transmit a 100MB chunk of data using various communication styles. The utility supports the following communication styles:

- TCP/UDP IPv4/IPv6
- MMAP file and named pipe
- Unix Domain Socket (UDS): stream and datagram

The utility has two modes: server and client. In the server mode, STNC listens on a specific port and waits for incoming connections from clients. In the client mode, STNC sends data to a specific server.

Usage

To start the server, run:

stnc -s PORT -p -q

PORT is the port number to listen on.

-p flag indicates that we are going to test the performance.

-q flag enables quiet mode, in which only testing results will be printed.

To start the client, run:

stnc -c IP PORT -p TYPE PARAM

IP is the IP address of the server.

PORT is the port number of the server.

-p flag indicates that we are going to test the performance.

TYPE is the communication type, **PARAM** is a parameter for the communication type. which can be one of the following:

ipv4_tcp

ipv4_udp

ipv6_tcp

ipv6_udp

uds_dgram

uds_stream

mmap filename

pipe filename

The results will be in milliseconds (ms) and printed like this:

NAME_TYPE,TIME

Example

To start the server:

stnc -s 1234 -p -q

To start the client and connect to the server using IPv4 TCP:

stnc -c 127.0.0.1 1234 -p ipv4 tcp

```
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -s 1234 -p -q
```

```
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p ipv4 tcp
ipv4_tcp,397.00
```

more runnings:

```
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p ipv4 udp
ipv4_udp,435.23
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p ipv4 tcp
ipv4_tcp,228.39
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p ipv6 udp
ipv6_udp,504.20
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p pipe filename
pipe_filename,299.19
renana@renana-VM:~/Desktop/operating systems/IPC$ ./stnc -c 127.0.0.1 1234 -p uds stream
uds_stream,426.37
```