Computer Networks Lab 6

CS F303

Susmit Wani 2018A7PS0116G

Lab 6 : TCP Server to Accept Multiple but Limited Number of Clients

Dasgaonkar Yogesh Namdeo • Mar 20 (Edited Mar 21)

Labs • 19 points **Due 6:59 PM**

Question

Write a TCP server and a client for the following.
1. The server as a command line argument accepts the port number to which it should bind. (1 mark)
2. The client, as command line arguments, accepts the IP address and the port number at which it will find the server. (1 mark)
3. After connecting to the server, the client reads a line from the standard input and sends it to the server. (1 mark)
4. The server prints the received line in the reverser order (2 marks) and reads a line from the standard input and sends it to the client or all the clients. (1 mark)
5. The client prints the received line in the reverse order and is ready to accept a new line from the user. (2 marks)
6. The client exits if the user type "exit". (1 mark)
7. The server at a time accepts at the most four clients. (4 marks) Any client above the limit is rejected. (4 marks) As and when the number is less than the limit, the server accepts the new client. (2 marks)

Notes
1. All the students will upload C code along with a PDF file containing the screenshots of the executed program on Google classroom
2. Submit a README file giving instruction for compilation and execution

1. Server

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ gcc -o server server.c
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./server 8000
Attempting to create socket on port number 8000
Socket created successfully.
Binded to the server successfully
Server listening
Connection accepted from 127.0.0.1:58288
Number of connections: 1
Connection accepted from 127.0.0.1:58290
Number of connections: 2
Connection accepted from 127.0.0.1:58292
Number of connections: 3
Connection accepted from 127.0.0.1:58294
Number of connections: 4
Connection to 127.0.0.1:58296 rejected because of client capacity


Text from 127.0.0.1:58288:
enO
Enter your message:
Text from 127.0.0.1:58290:
owT
Enter your message:
Text from 127.0.0.1:58292:
eerhT
Enter your message:
Text from 127.0.0.1:58294:
ruoF
Enter your message:One

Two

Three
```

```
Enter your message:One

Two

Three

Four

Connection terminated from 127.0.0.1:58288
Connection terminated from 127.0.0.1:58290
Connection accepted from 127.0.0.1:58302
Number of connections: 3

Text from 127.0.0.1:58302:
enO
Enter your message:One
```

2. Clients

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ gcc -o client client.c
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 127.0.0.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 1
Enter your message:One
Message from server:

enO
Enter your message:
```

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 127.0.0.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 2
Enter your message:Two
Message from server:

owT
Enter your message:
```

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 127.0.0.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 3
Enter your message:Three
Message from server:

eerhT
Enter your message:
```

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 12
7.0.0.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 4
Enter your message:Four
Message from server:

ruoF
Enter your message:
```

As we can see, all these 4 clients are the ones which have connected to the server as limit is 4

2. Clients

```
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 127.0.0
.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 5
Too many clients connected. Try again later.
susmit@susmit-VB:~/Desktop/CN Lab 6$
```

The client which could not connect to the server because 4 clients were already connected to the server. It connects, realises there is a crowd, and exits.

2. Clients

```
connected to the server successfully
Connections to server are 1
Enter your message:One
Message from server:

enO
Enter your message:exit
Closing connection
susmit@susmit-VB:~/Desktop/CN Lab 6$ ./client 127.0.0.1 8000
Connecting to IP address: 127.0.0.1
Attempting to connect to port: 8000
Socket created successfully.
connected to the server successfully
Connections to server are 3
Enter your message:One
Message from server:

enO
Enter your message:One
```

```
Text from 127.0.0.1:58292:
eerhT
Enter your message:
Text from 127.0.0.1:58294:
ruoF
Enter your message:One

Two

Three

Four

Connection terminated from 127.0.0.1:58288
Connection terminated from 127.0.0.1:58290
Connection accepted from 127.0.0.1:58302
Number of connections: 3

Text from 127.0.0.1:58302:
enO
Enter your message:One


Text from 127.0.0.1:58302:
enO
Enter your message:
```

The first client exits, as can be seen on slide 1. Note that client 2 also exits. (Screenshot not attached from client side but can be seen from picture on right)

The client exits when exit is typed into the chat in the picture on the left

Now there are only 2 clients connected. When new client joins, it shows total connections as 3, which is correct and connects to the server. Messages exchanged can be seen in the two terminals.