

Wireshark : Using TCP :

Server :

```
#include <unistd.h>
#include <stdio.h>
#include <sys/socket.h>
#include <stdlib.h>
#include <netinet/in.h>
#include <string.h>
#define PORT 8080
int main(int argc, char const *argv[])
{
    int server_fd, new_socket, valread;
    struct sockaddr_in address;
    int opt = 1;
    int addrlen = sizeof(address);

    // Creating socket file descriptor
    if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
    {
        perror("socket failed");
        exit(EXIT_FAILURE);
    }

    // Forcefully attaching socket to the port 8080
    if (setsockopt(server_fd, SOL_SOCKET, SO_REUSEADDR | SO_REUSEPORT,
                  &opt, sizeof(opt)))
    {
        perror("setsockopt");
        exit(EXIT_FAILURE);
    }
    address.sin_family = AF_INET;
    address.sin_addr.s_addr = INADDR_ANY;
    address.sin_port = htons( PORT );

    // Forcefully attaching socket to the port 8080
    if (bind(server_fd, (struct sockaddr *)&address,
            sizeof(address))<0)
    {
        perror("bind failed");
        exit(EXIT_FAILURE);
    }
}
```

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if (listen(server_fd, 3) < 0)
{
    perror("listen");
    exit(EXIT_FAILURE);
}
if ((new_socket = accept(server_fd, (struct sockaddr *)&address,
                        (socklen_t*)&addrlen))<0)
{
    perror("accept");
    exit(EXIT_FAILURE);
}

char stri[1024];
valread = read( new_socket , stri, sizeof(stri));
printf("Text recieved : %s\n", stri);

send(new_socket , stri , sizeof(stri), 0);
printf("Text sent\n");
return 0;
}

```

```

student@jai: ~/Documents/ [redacted] 4Sep2019
File Edit View Search Terminal Help
student@jai:~/Documents/[redacted]/4Sep2019$ gcc server.c
student@jai:~/Documents/[redacted]/4Sep2019$ ./a.out
Text recieved : NetworkAndCommunication
Text sent
student@jai:~/Documents/[redacted]/4Sep2019$ 

```

Client :

```

#include <stdio.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <unistd.h>
#include <string.h>
#define PORT 8080

int main(int argc, char const *argv[])
{
    int sock = 0, valread;
    struct sockaddr_in serv_addr;
    if ((sock = socket(AF_INET, SOCK_STREAM, 0)) < 0)
    {
        printf("\n Socket creation error \n");
        return -1;
    }

    serv_addr.sin_family = AF_INET;
    serv_addr.sin_port = htons(PORT);

    // Convert IPv4 and IPv6 addresses from text to binary form
    if(inet_pton(AF_INET, "127.0.0.1", &serv_addr.sin_addr)<=0)
    {
        printf("\nInvalid address/ Address not supported \n");
        return -1;
    }

    if (connect(sock, (struct sockaddr *)&serv_addr, sizeof(serv_addr)) < 0)
    {
        printf("\nConnection Failed \n");
        return -1;
    }

    printf("Enter the text : ");
    char stri[1024];
    scanf("%s", stri);

    send(sock , stri , sizeof(stri), 0);
    printf("Text sent\n");

    char res[1024];
    valread = read( sock , res, sizeof(res));
    printf("The text recieved : %s\n", res);

    int i=0;
    if(strlen(stri)!=strlen(res))
    {

```

```

    printf("Echo Unuccessful!!\n");
}
else
{
    int flag = 1;
    for(i=0;i<strlen(res);i++)
    {
        if(res[i]!=stri[i])
        {
            flag=0;
            break;
        }
    }
    if(flag)
    {
        printf("Echo Successful!!\n");
    }
    else
    {
        printf("Echo Unuccessful!!\n");
    }
}
return 0;
}

```

```

student@jai: ~/Documents/[redacted] 4Sep2019
File Edit View Search Terminal Help
student@jai:~/Documents/[redacted]4Sep2019$ gcc client.c
student@jai:~/Documents/[redacted]4Sep2019$ ./a.out
Enter the text : NetworkAndCommunication
Text sent
The text recieved : NetworkAndCommunication
Echo Successful!!
student@jai:~/Documents/[redacted]4Sep2019$ 

```

Wireshark

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	127.0.0.1	127.0.0.1	TCP	74	56088 → 7777 [SYN] Seq=0 Win=43690 Len=0 MSS=65495 SACK_PERM=1 TSval=3376507505 TSecr=
2	0.000022659	127.0.0.1	127.0.0.1	TCP	74	7777 → 56088 [SYN, ACK] Seq=0 Ack=1 Win=43690 Len=0 MSS=65495 SACK_PERM=1 TSval=337650
3	0.000045509	127.0.0.1	127.0.0.1	TCP	66	56088 → 7777 [ACK] Seq=1 Ack=1 Win=43776 Len=0 TSval=3376507505 TSecr=3376507505
4	2.358158529	127.0.0.1	127.0.0.1	TCP	1090	56088 → 7777 [PSH, ACK] Seq=1 Ack=1 Win=43776 Len=1024 TSval=3376509864 TSecr=33765075
5	2.358186252	127.0.0.1	127.0.0.1	TCP	66	7777 → 56088 [ACK] Seq=1 Ack=1025 Win=45824 Len=0 TSval=3376509864 TSecr=3376509864
6	2.358435131	127.0.0.1	127.0.0.1	TCP	1090	7777 → 56088 [PSH, ACK] Seq=1 Ack=1025 Win=45824 Len=1024 TSval=3376509864 TSecr=33765
7	2.358450749	127.0.0.1	127.0.0.1	TCP	66	56088 → 7777 [ACK] Seq=1025 Ack=1025 Win=45824 Len=0 TSval=3376509864 TSecr=3376509864
8	2.358647223	127.0.0.1	127.0.0.1	TCP	66	7777 → 56088 [FIN, ACK] Seq=1025 Ack=1025 Win=45824 Len=0 TSval=3376509864 TSecr=33765
9	2.358806110	127.0.0.1	127.0.0.1	TCP	66	56088 → 7777 [FIN, ACK] Seq=1025 Ack=1026 Win=45824 Len=0 TSval=3376509864 TSecr=33765
10	2.358826489	127.0.0.1	127.0.0.1	TCP	66	7777 → 56088 [ACK] Seq=1026 Ack=1026 Win=45824 Len=0 TSval=3376509864 TSecr=3376509864

Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0

Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)

Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1

Transmission Control Protocol, Src Port: 56088, Dst Port: 7777, Seq: 0, Len: 0

Wireshark · Packet 1 · wireshark_lo_20191009113135_Sw3j1J

Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0

Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)

Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1

Transmission Control Protocol, Src Port: 56088, Dst Port: 7777, Seq: 0, Len: 0

0000 00 00 00 00 00 00 00 00 00 00 00 00 00 45 00E.

0010 00 3c 1d 3c 40 00 40 00 1f 7e 7f 00 00 01 7f 00 .<.<0.0. ~-.....

0020 00 01 0b 18 1e 61 52 11 62 f8 00 00 00 00 a0 02aR. 0.....

0030 aa aa fe 30 00 00 02 04 ff d7 04 02 08 0a c9 41 ..0.....A

0040 6a 71 00 00 00 01 03 03 07 jq.....

No.: 1 - Time: 0.000000000 - Source: 127.0.0.1 - Destination: 127.0.0.1 - Protocol: TCP - Length: 74 - Info: 56088 → 7777 [SYN] Seq=0 Win=43690 Len=0 MSS=65495 SACK_PERM=1 TSval=3376507505 TSecr=0 WS=128

HelpClose