Department of Computer Science and Engineering

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UCS1511 - Networks Laboratory

Exercise 2: File Transfer using TCP

Objective:

Transfer a file from server to client using TCP socket programming.

Code:

Server:

```
#include<stdio.h>
#include<sys/types.h>
#include<sys/socket.h>
#include<netinet/in.h>
#include<string.h>
#include<fcntl.h>

```

```
int main(int argc,char **argv){
    //Server and Client addresses
    struct sockaddr_in server_address, client_address;
    //Buffer to handle messages
    char buffer[1024];

    //Socket file descriptor
    int sockfd = socket(AF_INET, SOCK_STREAM, 0);//domain = IPv4, type = TCP, protocol = IP
    if(sockfd < 0)
        perror("Error: Unable to create socket");

    //Filling server_address with null bytes
    bzero(&server_address, sizeof(server_address));

    server_address.sin_family = AF_INET;// Uses the Internet address family
    server_address.sin_addr.s_addr = INADDR_ANY;// Use any of the available addresses
    server_address.sin_port = htons(4500);// Connect to specified port 4500

    //Bind socket to the specified port
    if(bind(sockfd, (struct sockaddr*)&server_address, sizeof(server_address))<0)
        perror("Bind error");

    //Look for clients to serve, with a maximum limit of 2.
    listen(sockfd, 2);

    //New socket file descriptor to handle connections.
    int len = sizeof(client_address);
    int newfd = accept(sockfd, (struct sockaddr*)&client_address, &len);

    //Read file name from buffer
    read(newfd, buffer, sizeof(buffer));
    printf("\nFile to be transferred to Client: %s\n", buffer);

    int sourcefd = open(buffer, O_RDONLY);
    if(sourcefd == -1){
        printf("\nNo source file");
    }
    else{
```

```c
        bzero(buffer, sizeof(buffer));
        //Read file contents
        int readfd = read(sourcefd, buffer, sizeof(buffer));
        buffer[readfd] = '\0';
        //Send file contents back to client
        write(newfd, buffer, sizeof(buffer));
        close(sourcefd);
    }
    printf("\n File successfully transferred\n");
    close(sockfd);
    close(newfd);
    return 0;
}
```

Client:

```c
#include<stdio.h>
#include<sys/types.h>
#include<sys/socket.h>
#include<netinet/in.h>
#include<string.h>
#include<fcntl.h>

int main(int argc,char** argv){
    //Server and client addresses
    struct sockaddr_in server_address, client_address;
    //Buffer to handle messages
    char buffer[1024];

    //Server socket file descriptor
    int sockfd = socket(AF_INET, SOCK_STREAM, 0);//(domain = Ipv4, type = TCP, protocol = 0
    if(sockfd < 0)
        perror("Error: Unable to create socket");

    //Filling server address with null bytes
    bzero(&server_address, sizeof(server_address));

    server_address.sin_family = AF_INET;//Use the Internet address family
    server_address.sin_addr.s_addr = inet_addr(argv[1]);//Use ip address passed as command line argument
    server_address.sin_port = htons(4500);//Connect socket to port 4500

    //Attempt to connect client to socket on specified port
    connect(sockfd, (struct sockaddr*)&server_address, sizeof(server_address));

    int len = sizeof(client_address);

    //Write file name into buffer
    printf("Enter the path of file: ");scanf(" %[^\n]", buffer);
    write(sockfd, buffer, sizeof(buffer));

    //Read file contents from buffer
    read(sockfd, buffer, sizeof(buffer));
    printf("\nFile contents: %s\n", buffer);

    printf("\nFile successfully received\n");
    //Write file contents to new file
    int destfd = open("dest.txt", O_RDWR|O_CREAT);
    if(destfd == -1){
        printf("\nUnable to create destination file\n");
    }
    else{
        int writefd = write(destfd, buffer, sizeof(buffer));
        close(destfd);
        printf("\nFile Saved at: dest.txt\n");
    }
    close(sockfd);
    return 0;
}
```

Output:

Server:

```
File to be transferred to Client: ./source.txt

File successfully transferred
```

Client:

```
Enter the path of file: ./source.txt

File successfully received

File contents: hi this is from ssn cse
hello world
123
456
789
000

File Saved at: ./dest.txt
```