File Transfer Using Socket Programming In c

Onkar N. Kapuskari  
Dept. of IT, VIT, Pune, India  
onkar.kapuskari221@vit.edu

Samarth D. Kamble  
Dept. of IT, VIT, Pune, India  
samarth.kamble22@vit.edu

Jay D. Kumawat Dept. of IT, VIT, Pune, India  
jay.kumawat22@vit.edu

Kartik M. Palve  
Dept. of IT, VIT, Pune, India  
kartik.palve22@vit.edu

Limay K. Karsi Dept. of IT, VIT, Pune, India  
limay.karsi22@vit.edu

Introduction :

File transfer using socket programming in C is a compelling and practical project that showcases the power of networking and low-level programming. In today's interconnected world, the ability to seamlessly exchange files between devices is of paramount importance. This project aims to demonstrate how to create a robust file transfer system using C programming and socket communication. By leveraging the principles of sockets, you can build a versatile solution for sending and receiving files across a network.This project not only enhances your understanding of network programming but also equips you with a valuable skill set in an era where data exchange plays a pivotal role in information technology.

Objectives :

1. Socket Communication : Demonstrate the ability to establish socket connections, both for client and server, to f acilitate data transfer
2. File Handling : Implement efficient file I/O operations for reading, writing, and managing files on both the sender and receiver sides..
3. Testing and Debugging : Rigorously test the application, including scenarios involving various file types and sizes, to ensure reliability and robustness. Debug and resolve any issues that may arise.
4. Methodology :
5. Project planning

Initiated this project with the transfer of text file(.txt), image file(.jpg), video file(.mp4), PDF file(.pdf). For this, requirement of a secure coonection has been created using sockets (esp. TCP sockets) connection In c . For creating the connections, we decided to create a user defined library “socket.h” which will cover all the functionalities required from creating sockets to establishing connections, detailed elaboration about this library will see in code component section. The next task is to generate algorithms for the file transfer. There are two types of algorithms implemented in this project. One for text file transfer and the other for image/video/pdf. Depending upon the algorithms, function and data structures are decided to solve the problem. In the section of Algorithms and Code components, we will explore the things in detail.

1. Algorithms
2. Text file transfer :
3. client :
4. Create Socket and establish connection. This socket will of type TCP, belonging to family AF\_INET by providing avaliablie port number and IP for binding sockets. Creation of socket and establishment of connection will done with help of user defined library “socket.h”.This library contains all the functionalities requires for connection establishment.
5. Read the fileName from the client. Open the file in read mode (“r”). using fopen() function.
6. Read the contains of the file line by line with help of fgets() function and store the contains of the line in buffer and send to server side by side.
7. Data from the buffer is sent by send() function in a iterative manner.
8. Close the file with the help of fclose() function , which ensures that all resources are properly released, it prevents data corruption and improves the performance of program.
9. Stop the connection by using close() function.
10. server :
11. Create socket and establish connection.
12. Create/Open a file in write mode (“w”) with the help of fopen() function.
13. Print/write the contains received from the client, to the file opened in the write mode on the server side, line by line with the help of fprintf() function.
14. close the file by the fclose() function.
15. stop the connection. using close().
16. Image/Video/PDF file transfer :
17. client :
18. Create Socket and establish connection. This socket will of type TCP, belonging to family AF\_INET by providing avaliablie port number and IP for binding sockets. Creation of socket and establishment of connection will done with help of user defined library “socket.h”.This library contains all the functionalities requires for connection establishment
19. Read the fileName from the client. Open the file in binary read mode (“rb”). using fopen() function.
20. Read the contains byte wise and store them in buffer byte-wise and send to server side by side. byte wise reading of file takes places by using fread() function.
21. Once after reading bytewise and storing, sent that buffer having size as that of byte read using send() function.
22. close the file with help of fclose() finction.
23. stop the connection by closing the socket formed by close() function.
24. server :
25. Create socket and establish connection.
26. Create/Open a file in write mode (“w”) with the help of fopen() function.
27. Receive the file contains byte wise