Practical Work 1: TCP File Transfer

1. Protocol Design

The protocol for the file transfer uses the following steps:

1. The client connects to the server using a socket.
2. The client sends a command to the server: `upload`, `download`, or `exit`.
3. For file upload:
    - The client sends the file name and file data in chunks.
    - The server receives the data and writes it to a file on the server.
4. For file download:
    - The client requests a file.
    - The server sends the file data in chunks if the file exists.
5. The session ends when the client sends the `exit` command.

Figure: Protocol Design Diagram

2. System Organization

The system consists of two components:

1. **Server:**
    - Initializes a socket.
    - Waits for a connection from a client.
    - Handles commands from the client (upload, download, exit).
2. **Client:**
    - Connects to the server using a socket.
    - Sends commands and file data to the server.
    - Receives file data from the server.

Figure: System Organization Diagram

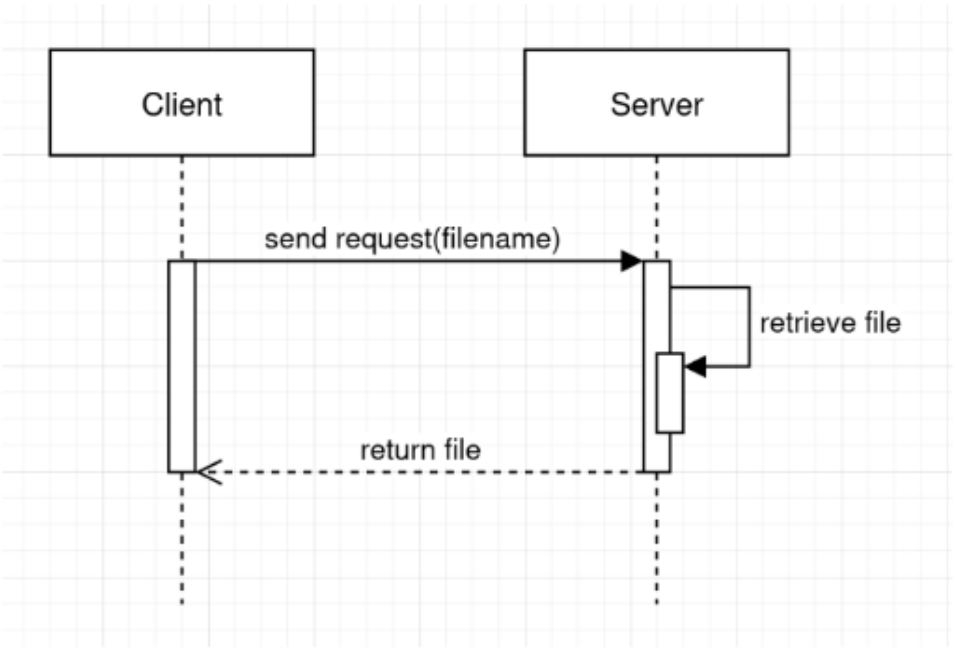

Figure 1: Client-Server Interaction Protocol

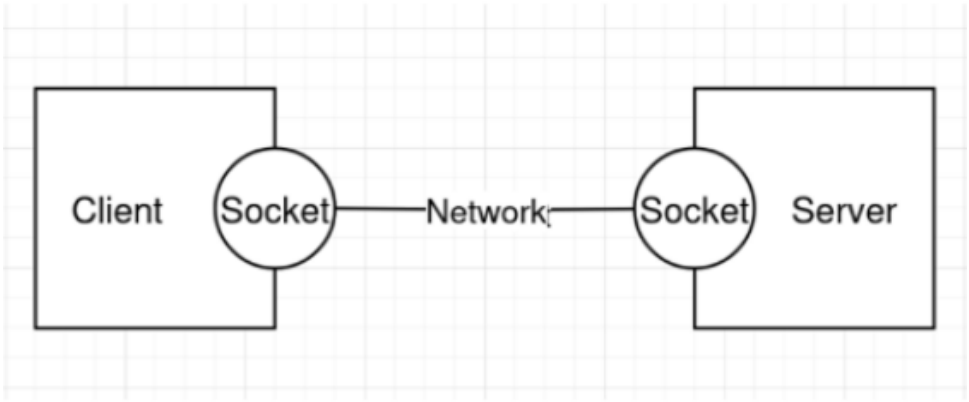

Figure 2: System Architecture

3. Implementation of File Transfer

The implementation was divided into the following tasks:

1. **Server Implementation:** The server is responsible for initializing the socket, accepting connections, and handling client commands.
2. **Client Implementation:** The client is responsible for connecting to the server, sending commands, and managing file transfers.
3. **Protocol Handling:** Defined the commands and their corresponding actions, such as upload, download, and exit.

4. Team Contributions

The tasks were distributed as follows among the five team members:

- **Protocol Design:** Do Thi Huong Tra (BA12-174) and Vu Hoang Mai Nhi (22BI13352)
- **Server Code Implementation:** Cao Nhat Nam (22BI13320)
- **Client Code Implementation:** Pham Ngoc Minh Chau (22BI13063)
- **Report Writing and Final Compilation:** Bui Nguyen Ngoc Huyen (22BI13199)