

Practical Work 2: RPC File Transfer

1. RPC Service Design

The RPC (Remote Procedure Call) service is designed as follows:

1. The system uses XML-RPC as the communication protocol between the client and server.
2. The server exposes three main remote functions:
 - `upload_file(filename, file_data)`: Accepts a file from the client and saves it on the server.
 - `download_file(filename)`: Sends a file from the server to the client.
 - `exit_server()`: Gracefully terminates the server.
3. The client uses these remote functions to perform file transfers and communicate with the server.

2. System Organization

The system is organized into the following components:

1. **Client:**
 - Connects to the RPC server using XML-RPC.
 - Sends commands such as `upload`, `download`, and `exit`.
 - Handles file reading and writing on the client side.
2. **Server:**
 - Provides remote procedures to handle client requests.
 - Manages files (saves uploaded files, sends files for download).
 - Terminates upon receiving the `exit` command.

Figure: System Organization Diagram

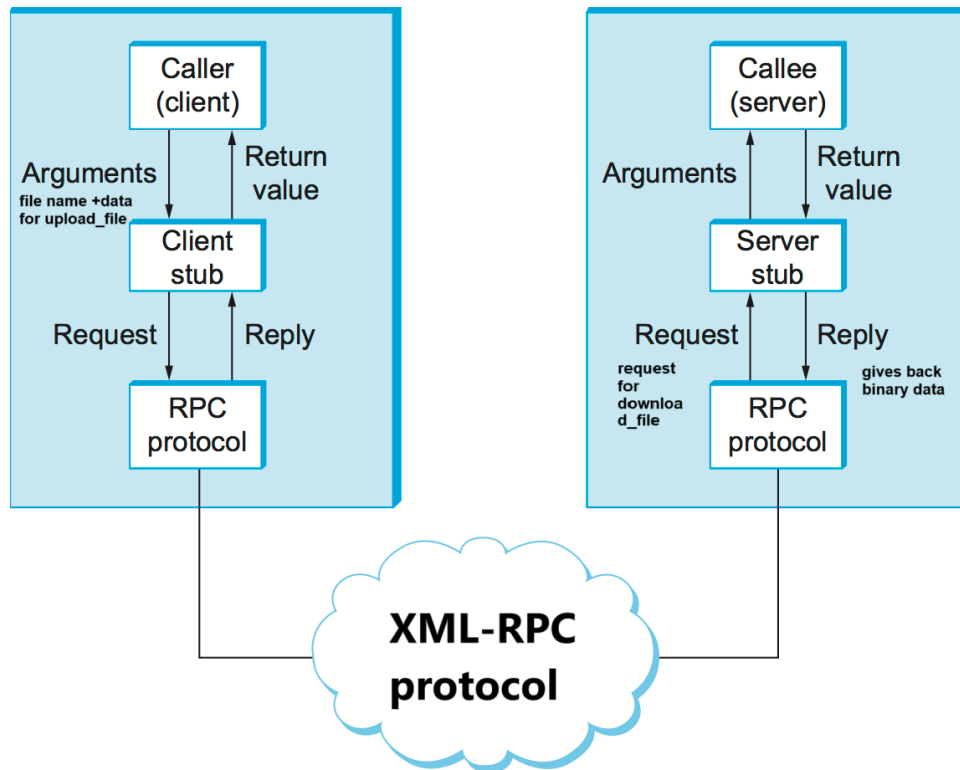


Figure 1: System Architecture

3. Implementation of File Transfer

The file transfer is implemented using the following key steps:

1. File Upload:

- The client reads the file, encodes it into binary, and sends it to the server using the `upload_file()` function.
- The server receives the binary data and writes it to a file on the server disk.

2. File Download:

- The client requests a file using the `download_file()` function.
- The server reads the file, encodes it into binary, and sends it back to the client.

3. Server Termination:

- The client sends an `exit` command using the `exit_server()` function.
- The server terminates gracefully after processing the command.

4. Team Contributions

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

- **Research on XML-RPC Technology:** Do Thi Huong Tra (BA12-174) and Vu Hoang Mai Nhi (22BI13352)

- **Design of the RPC Service and API:** Cao Nhat Nam (22BI13320)
- **Implementation of File Upload Functionality, File Download and Exit Functionality:** Pham Ngoc Minh Chau (22BI13063)
- **Testing and Report Writing:** Bui Nguyen Ngoc Huyen (22BI13199)