Documentation: Compiling, Running, and Testing RPC and RMI Code

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RPC Setup and Instructions

1.1 Environment Setup

- **Install Node.js**: Make sure Node.js is installed on your machine. Download it from the [Node.js Official Website](#). Verify the installation by checking the versions of Node.js and npm.
- **Install Dependencies**: Navigate to your project directory and run the command to initialize a new Node.js project and install the required packages. You will need `@grpc/grpc-js`, `@grpc/proto-loader`, and `winston` for logging.
- **Create Proto File**: Ensure you have the `calc.proto` file in your project directory, which defines the gRPC service and messages for the calculator operations.

1.2 Running the gRPC Server and Client

- **Run the Server**: Ensure the server code is saved as `server.js`. Start the gRPC server using the command to execute the server file. The server will listen on port `50051`, and log messages will be stored in `server.log`.
- **Run the Client**: Ensure the client code is saved as `client.js`. Start the gRPC client using the command to execute the client file. The client will prompt you for two numbers and an operation. Log messages will be stored in `client.log`.

1.3 RPC Test Case

- Start by running the server.
- Once the server is running, execute the client.
- Enter the first number (e.g., 10), the second number (e.g., 5), and choose an operation (e.g., 1 for Addition).
- Verify that the output on the client shows the correct result (e.g., Result: 15 Addition successful).
- Check `client.log` for input and operation logs, and `server.log` for the executed operations and results.

RMI Setup and Instructions

2.1 Environment Setup

- **Install Java**: Ensure you have Java installed on your machine. Download and install it from the [Java Official Website](#). Verify the installation by checking the versions of Java and the Java compiler (javac).
- **Create RMI Files**: Ensure you have the necessary RMI interface, implementation, and server files as part of your project.

2.2 Running the RMI Server and Client

- **Compile the Java Files**: Navigate to your project directory where the RMI files are located. Use the command to compile all Java files, which will generate the necessary class files.
- **Run the RMI Server**: Start the RMI registry using the command for the RMI registry. After that, run the command to execute the server file, which will bind the Calculator implementation to the registry.
- **Run the RMI Client**: Execute the command to run the client file. The client will prompt you to enter two numbers and select an operation to perform. The results will be displayed on the console.

2.3 RMI Test Case

- Start by executing the RMI registry and then run the server.
- After the server is running, execute the client.
- Input the first number (e.g., 10), the second number (e.g., 5), and select an operation (e.g., add).
- Verify that the client displays the correct result (e.g., Result: 15 for addition).
- Ensure that all operations and interactions are logged as specified in the implementation files.