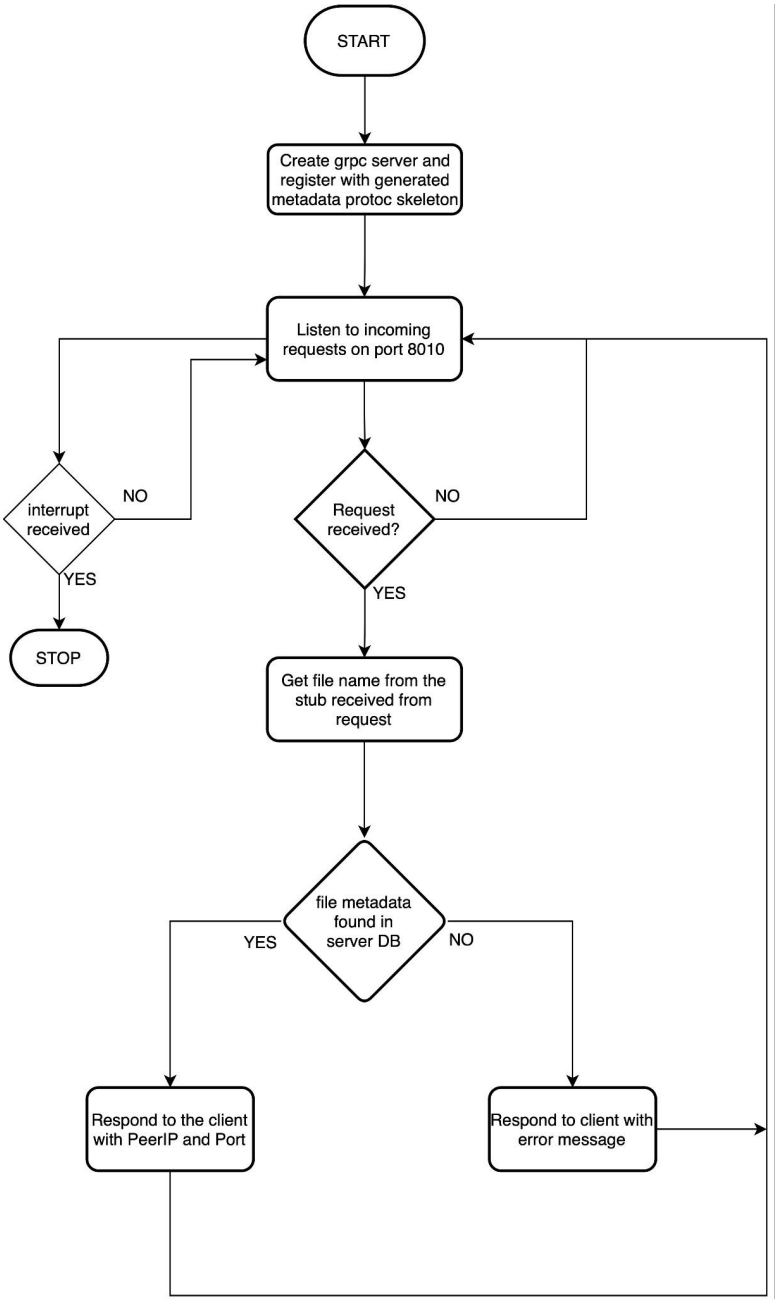
# IPDP Assignment

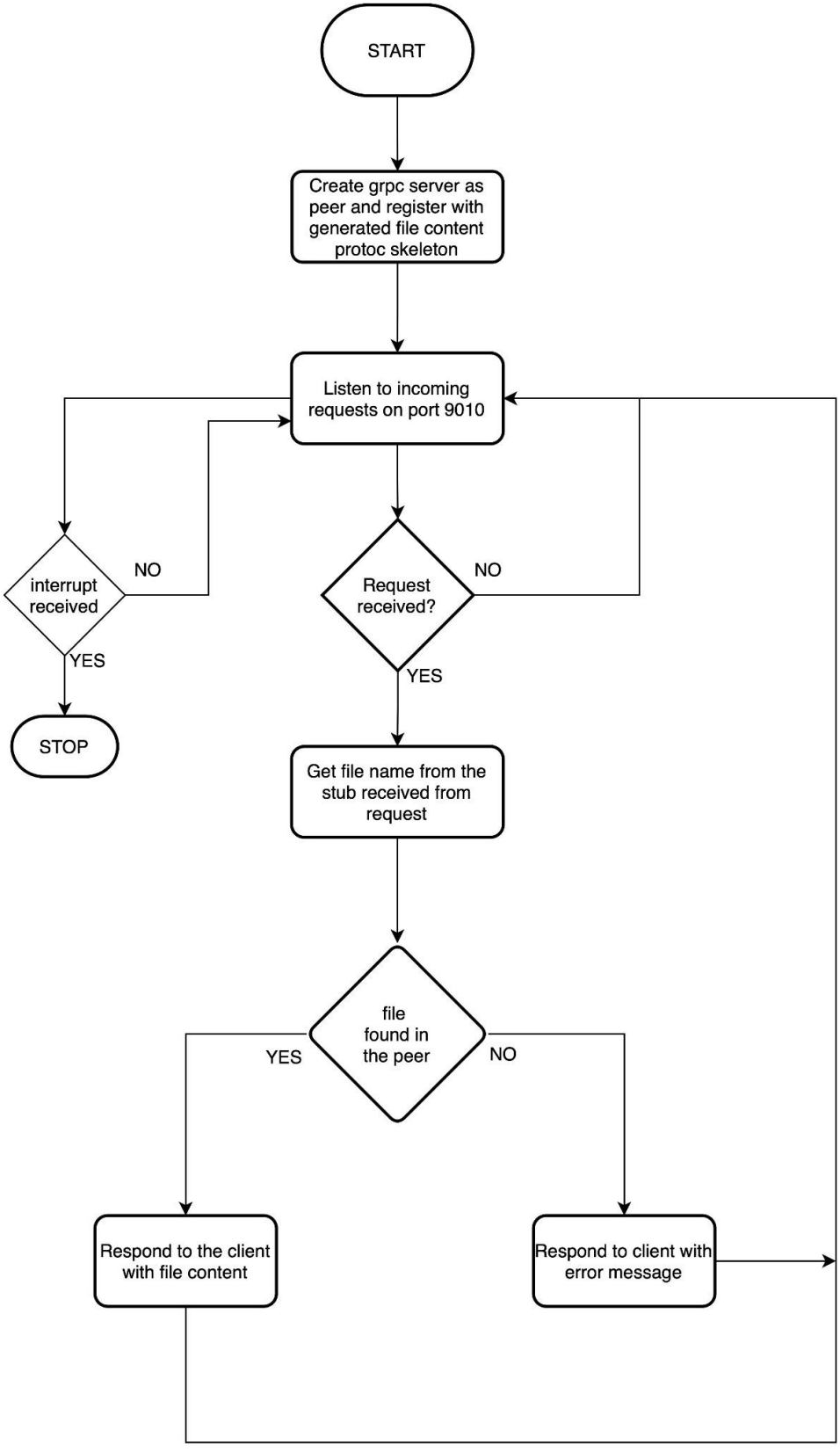
## Problem 2

### gRPC Implementation Design

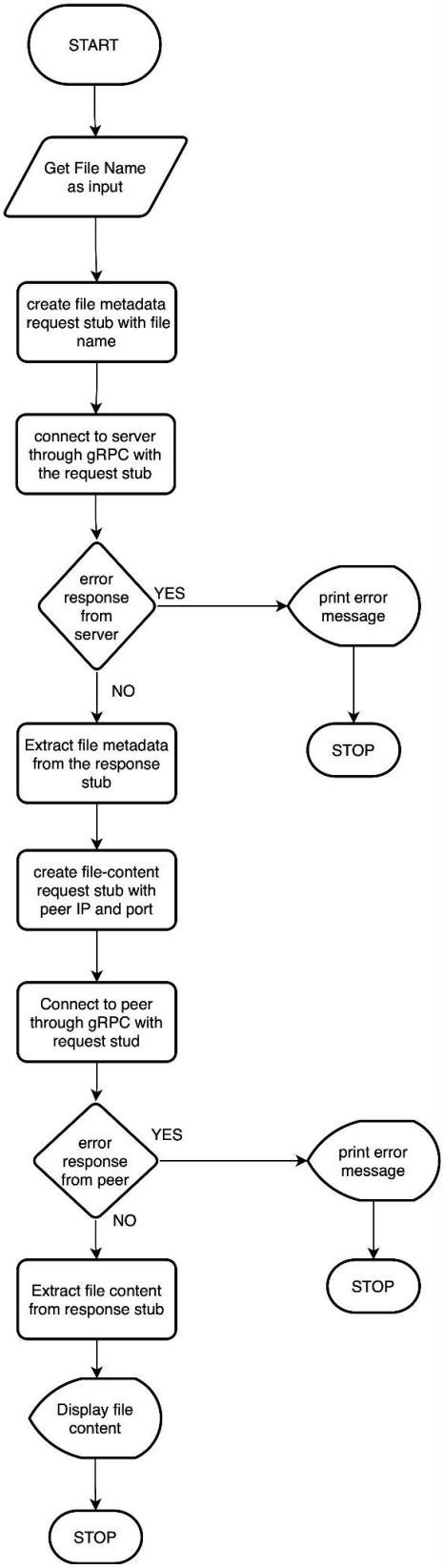
#### Server Process



# Peer Process



## Client Process on Peer Node



# Execution Steps

## Pre-requisites

1. Install Go version 1.21+ on all nodes

   Follow steps mentioned in https://go.dev/doc/install and install Go on all the nodes

2. Download the source code on all nodes

   Use Git cli tool to clone the below repository on all the nodes

   ```
   git clone https://github.com/thegoodparticle/ipdp-assignment.git
   ```

3. Move to problem 2 folder

   ```
   cd ipdp-assignment/P2
   ```

4. Creating protocol interface (skeletons and stubs) for File Metadata Server from protocol file (Optional - source code already has these files generated)

   ```
   protoc --go_out=. --go_opt=paths=source_relative --go-grpc_out=.
   --go-grpc_opt=paths=source_relative
   file-server/protobufs/file-meta.proto
   ```

5. Creating protocol interface (skeletons and stubs) for File Content Peer from protocol file (Optional - source code already has these files generated)

   ```
   protoc --go_out=. --go_opt=paths=source_relative --go-grpc_out=.
   --go-grpc_opt=paths=source_relative
   file-server/protobufs/file-data.proto
   ```

6. Update IP addresses

   Note down the peer node IP addresses and update them in file present in db/store.go

   ```
   vi db/store.go
   const data = `[{"client_ip": "<updated node i IP here>" …}]
   ```

   Update the server node IP in the file - client/client.go Line# 17

   ```
   vi client/client.go
   const ( serverIP = "<update server node IP here>")
   ```

## File Structure in Source Code

Source code follows layered directory structure to isolate different types of processes.

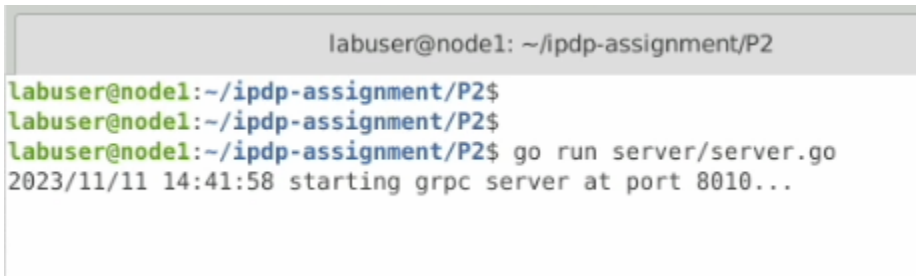
**P2**

- **client** // files that needs to run on client/peer node
  - **peer** // code required to run peer process
    - **fdata** // mp3 file storage
      - **<actual_file_with_content>**
    - **peer.go**
  - **client.go** // code that helps run the client process
- **db** // separate db layer for server process (to show isolation of server logic and database)
  - **store.go** // contains file metadata
- **file-server** // gRPC skeleton/stubs/protocol files
  - **file-data**
  - **file-meta**
  - **protobufs** // .protocol files
    - **file-data.proto**
    - **file-meta.proto**
- **server**
  - **server.go** // code that runs the server
- **README.md**

## Commands to Execute

1. Start the server on node 1

   **go run server/server.go**



2. Start the peers in all the 3 nodes

```
go run client/peer/peer.go <port_number>
// keep the same port number present in db/store.go file
```

```
labuser@node3:~/ipdp-assignment/P2$ ls client/peer/fdata/
ilahi.mp3  kala_chashma.mp3
labuser@node3:~/ipdp-assignment/P2$
labuser@node3:~/ipdp-assignment/P2$
labuser@node3:~/ipdp-assignment/P2$ go run client/peer/peer.go 9010
2023/11/11 14:42:29 starting grpc peer at port 9010...
```

3. Start the client process on any of the node and request for a file

```
go run client/client.go <file_name.ext>
```

```
labuser@node1:~/ipdp-assignment/P2$ go run client/client.go kala_chashma.mp3
2023/11/11 14:44:34 response received - clientIP:"172.31.19.212" portNumber:9010
2023/11/11 14:44:34 Requested file 'kala_chashma.mp3' has below content

 'Tenu kala chashma jachda ae, jachda ae gore mukhde te'

labuser@node1:~/ipdp-assignment/P2$
```

```
labuser@node1:~/ipdp-assignment/P2$
labuser@node1:~/ipdp-assignment/P2$ go run server/server.go
2023/11/11 14:41:58 starting grpc server at port 8010...
2023/11/11 14:42:55 received metadata info request for file memories.mp3
2023/11/11 14:42:55 responding with peer info PeerIP:172.31.5.236 PeerPort:9010

2023/11/11 14:43:45 received metadata info request for file bones.mp3
2023/11/11 14:43:45 responding with peer info PeerIP:172.31.24.112 PeerPort:9010
2023/11/11 14:44:34 received metadata info request for file kala_chashma.mp3
2023/11/11 14:44:34 responding with peer info PeerIP:172.31.19.212 PeerPort:9010
```

```
labuser@node3:~/ipdp-assignment/P2$
labuser@node3:~/ipdp-assignment/P2$ go run client/peer/peer.go 9010
2023/11/11 14:42:29 starting grpc peer at port 9010...
2023/11/11 14:44:34 responded content for file - kala_chashma.mp3
```

Thank You!