

CSE 513 Distributed Systems - Lab 1

Rahul Titus George,
91312814.

Technical overview

There are two main components

Server

- ➔ Handles all requests and replies apart from chunk requests.
- ➔ Keeps track of all files, all chunk and the corresponding peers that have the said chunks in a SQLite3 database.
- ➔ Uses one socket that listens or a server socket that creates a new thread for every peer that connects. Hence it's non blocking.
- ➔ Socket uses a reusable address and has a fixed port.
- ➔ Each request has a fixed header of the same standard length.

The server has a single message handler which checks the header of the message and then forwards it to the appropriate methods. Each method usually marshals the required data and then sends it. It then waits for the reply. This is non-blocking as the server spawns a new thread for each client.

Peer

- ➔ Registers the files it wants to share with the peer
- ➔ Divided each of these files into chunks.
- ➔ Can request for the global list of files available
- ➔ Each peer has two threads one that interacts with the server. The other it listens for other peers that might request for chunks. (Incomplete)

The database has two tables one simple table for the file list and other one for the chunks.
The server interacts with the server using this "sql driver" which interacts with the database directly.

Bugs

Currently a peer can see the file list, even get the file locations but that doesn't automatically trigger the download chunk feature.

The download feature is incomplete and hasn't been integrated with the file location reply. The idea here was that once the file location reply was received a peer could request the endpoints for the chunks it wants. The peer requesting the various chunks will spawn threads for each connection and the peers seeding the chunks are anyway on a separate thread from that of the main thread that interacts with the server.

The code I've written uses the default local IP and a default port.
Hence if we change the ports and IPs then the downloads will work, fixing any other minor bugs that maybe present.

Technical Specification

Language : C
Network Protocol - TCP (Sockets)
Socket Type- Socket Stream
Socket Domain – AF_INET
Database used : SQLite3
Makefile included

Screenshots

Server handling both register request and a file list request

```
Rahuls-MacBook-Pro:P2P rahultitusgeorge$ ./server
Server Socket Created
Server Socket Bound
Server Socket Listening
Initialzing database
New peer connected: 4
Request received REG_REQUEST
No of files: 1
File names size 8
File name size 8
File name: Makefile
File size: 221
IP address: 127.0.0.10
Updating the server file list
Reply sent: REGIS_REPLY
Request received FLI_REQUEST
Retrieving file list
Reply sent: FI_LS_REPLY
```

Client successfully registering and then requesting for the file list.

```
Rahuls-MacBook-Pro:P2P rahultitusgeorge$ ./peer Makefile
Chunk_Makefile_1
Chunk_Makefile_2
Chunk_Makefile_3
File Names Size 8
Message size: 34
Request size 0
No of Files 1
File Names Size 8
File name Size 8
File name Makefile
File size 221
Request REG_REQUEST 11
Sending register request
Bytes sent: 34
Registered successfully 1
Peer options
  1. Show me the file List
  2.Download a file
  3. View download status
  4.Misc
1
Sending FLI_REQUEST
File list received successfully FI_LS_REPLY
Number of files 2
9 is the file name size
File 1's name:16_16.mp4 and size:11598530
8 is the file name size
File 2's name:Makefile and size:221
Peer options
  1. Show me the file List
  2.Download a file
  3. View download status
  4.Misc
```

Client sends a file location request

```
Rahuls-MacBook-Pro:P2P rahultitusgeorges ./peer peer
Chunk_peer_1
Chunk_peer_2
File Names Size 4
Message size: 30
Request size 0
No of Files 1
File Names Size 4
File name Size 4
File name peer
File size 20348
Request REG_REQUEST 11
Sending register request
Bytes sent: 30
Registered successfully 1
Peer options
1. Show me the file List
2. Download a file
3. View download status
4. Misc
2
Specify file name
peer
Sending FLO_REQUEST
File(Chunk) locations received
Peer options
1. Show me the file List
2. Download a file
3. View download status
4. Misc
```

Server handles a file location request

```
Rahuls-MacBook-Pro:P2P rahultitusgeorges ./server
Server Socket Created
Server Socket Bound
Server Socket Listening
Initializing database
New peer connected: 4
Request received REG_REQUEST
No of files: 1
File names size 4
File name size 4
File name: peer
File size: 20348
IP address: 127.0.0.10
Updating the server file list
ERROR inserting data: UNIQUE constraint failed: CHUNKS.CHUNK_ID, CHUNKS.FILE_NAME, CHUNKS.IP_ADDRESS
ERROR inserting data: UNIQUE constraint failed: CHUNKS.CHUNK_ID, CHUNKS.FILE_NAME, CHUNKS.IP_ADDRESS
ERROR inserting data: UNIQUE constraint failed: FILES.FILE_NAME, FILES.IP_ADDRESS
Reply sent: REGIS_REPLY
Request received FLO_REQUEST
Received a file location request
Received a file location request for file peer
Chunk id 1, file name peer chunk name Chunk_peer_1REQUEST
Chunk id 2, file name peer chunk name Chunk_peer_2REQUEST
Reply sent: FI_LO_REPLY
```