Design Document:-

Files used in my code:-

- Client1_Test.java
- Servers.txt

File details:-

- Client1_Test.java

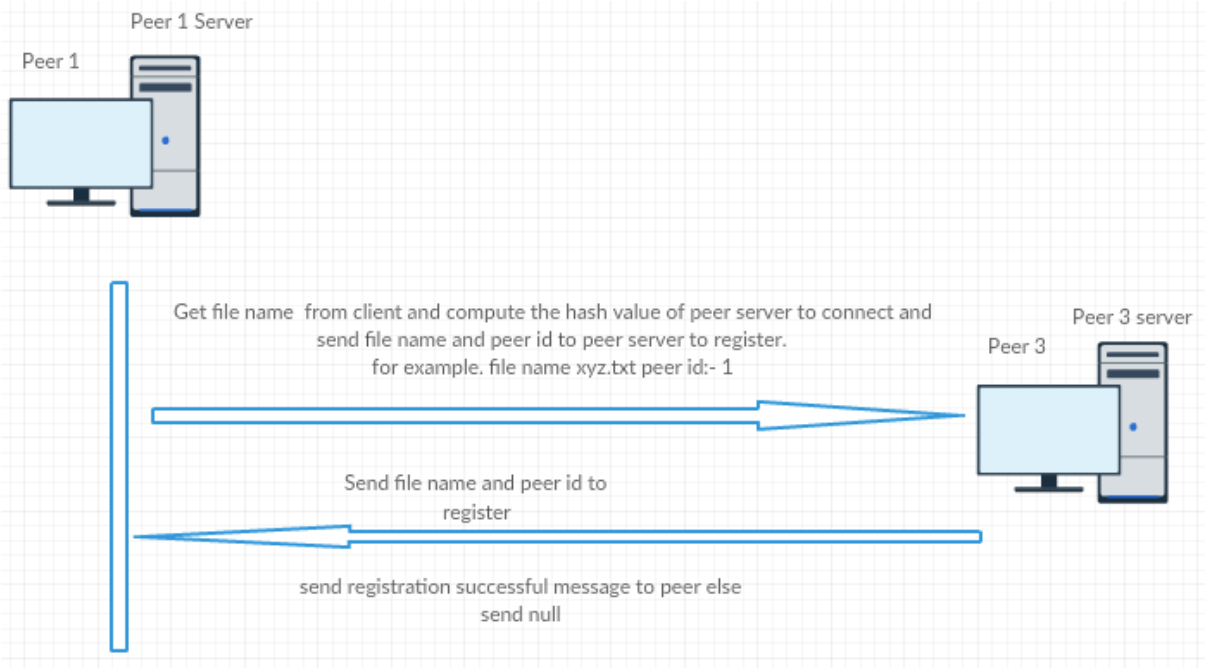
  This file has two threads running concurrently

  1) Peer thread: - This thread will handle all the input operations of client.
  2) Peer Server thread:- This thread will handle all the incoming request from peers and this thread will fulfil their request.

- Servers.txt

  This file is responsible for providing all the details of peer servers to connect. Peer will read all the details (Ip address and port) at the start and create socket array and initiate a connection with all peer servers. This will save time and memory as we do not need to create thread for each client request to server as it is already created we can use the existing socket connection.

1) Register Operation



If multiple clients to has same then same peer id details will get appended to same value files of key.

For example.

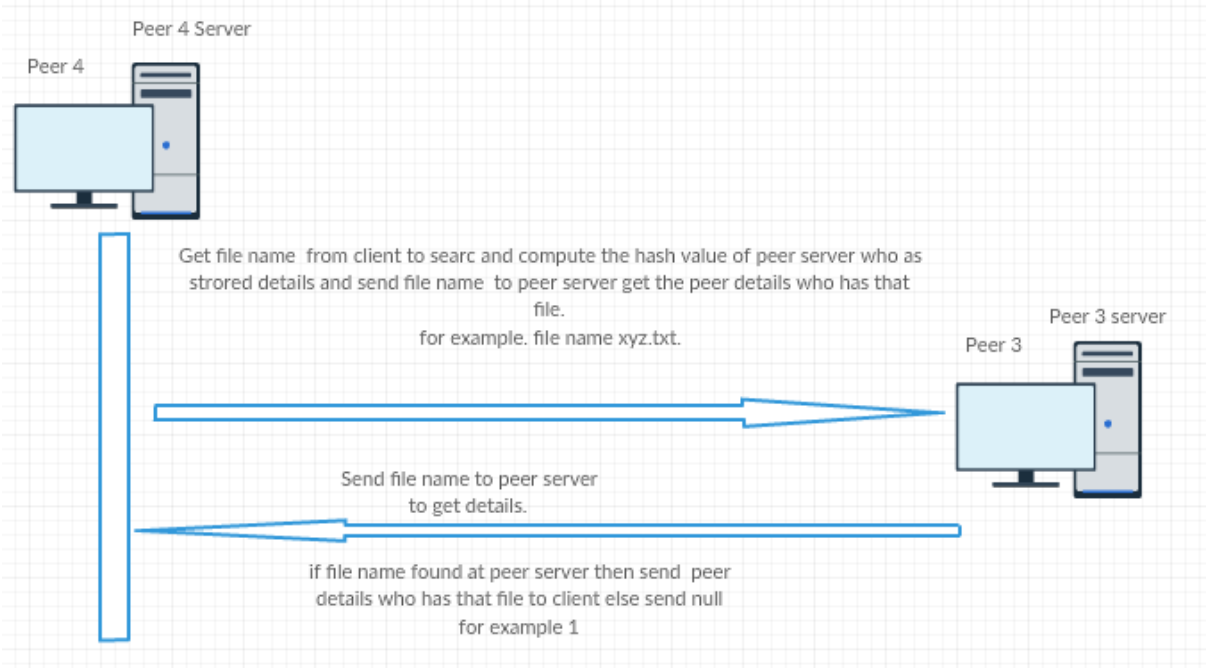
Peer 1 and peer 5 has xyz.txt then hash function will compute the same hash value for both server suppose 3 then both peer 1 and peer 5 will connect to peer 3 to register file.

Registry at peer 3 will look like below after both register there file.

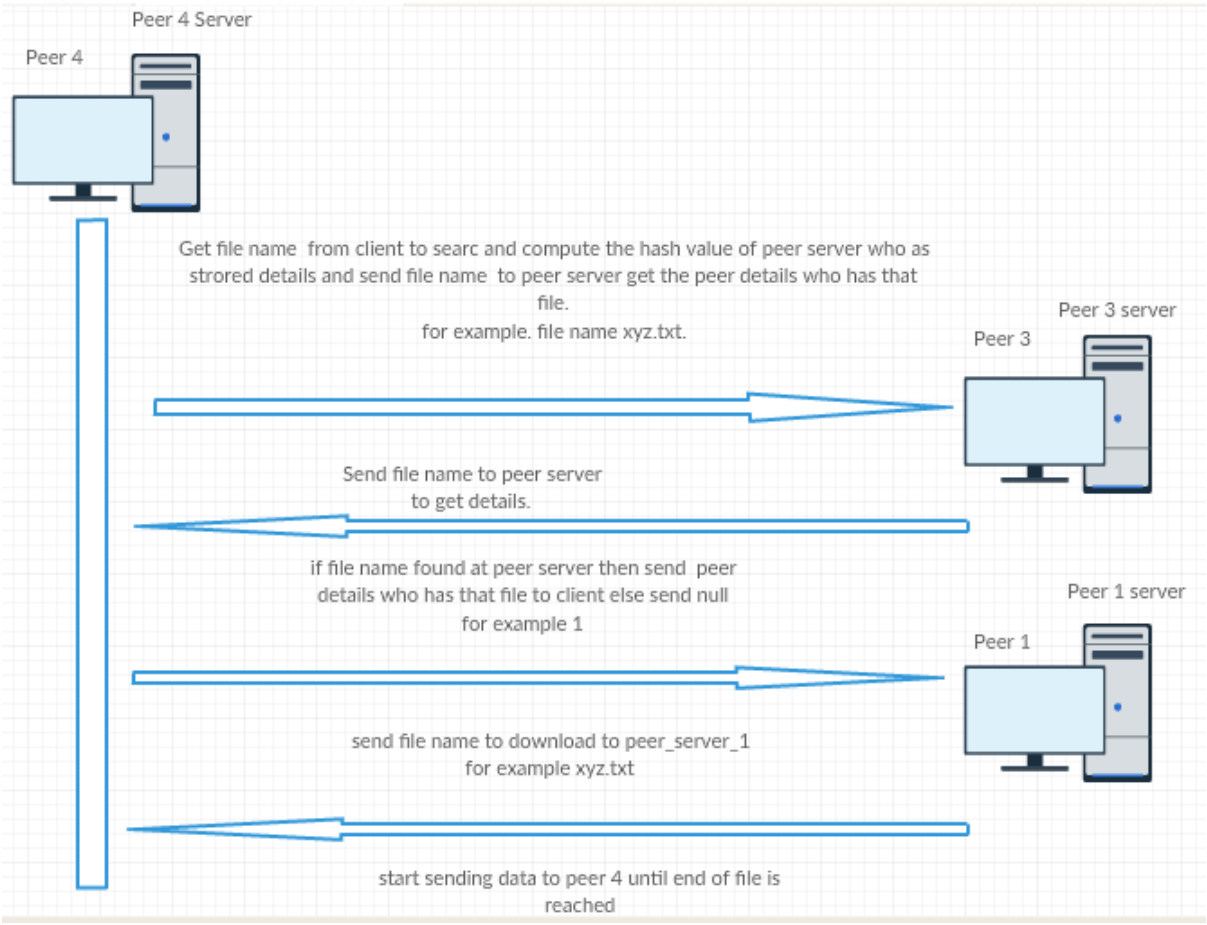
xyz.txt 1,5

(key) (value)

2) Search Operation:-



3) Obtain operation:-



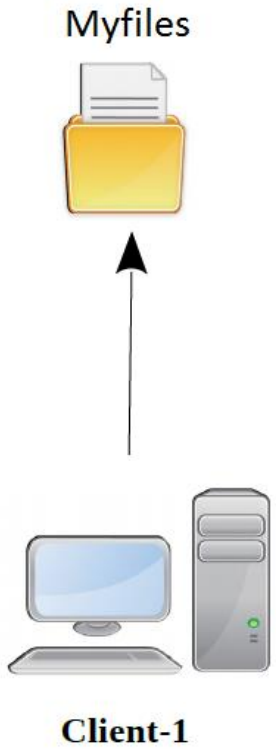
In obtain operation client who wish to download file will get details of all peer servers who has that file then client can enter peer id from which he wish to download file.

4) Replica handling:

When user goes for registration file will be sent to other server to store replica.

Example:

1. If user wants to register “xyz.txt” file.
2. Generated hashcode is 1.
3. Now file is going to register at PEER_SERVER_1.
4. Replica of file is going to save in SERVER_7.
5. All files will be stored at Myfiles directory
6. When user get SocketConnection exception from primary server while trying to download file then user will connect to replica server automatically to get file.



5) Condition where code will not work:-

1) To increase performance, all messages are passing are sent in string format.

2) User should register all its server details correctly without extra space at server.txt file.

3) User should register all the files before search or obtain operation.

6) Future improvements:-

- One single message can be sent to server to receive file as below. This will improve the performance of system.

Length of KEY	Length of VALUE	Space allocated for KEY	Space allocated for VALUE	OPERATION CODE

OPERATION CODE:
000 = PUT
001 = GET
010 = DELETE
011 = BACKUP_GET
100 = DOWN
111 = INVALID

- Automatic registration of all files contained inside Myfiles directory. This can be done simply by reading all files inside directory and sending file names to register function one by one to register.