CS550 Assignment 3
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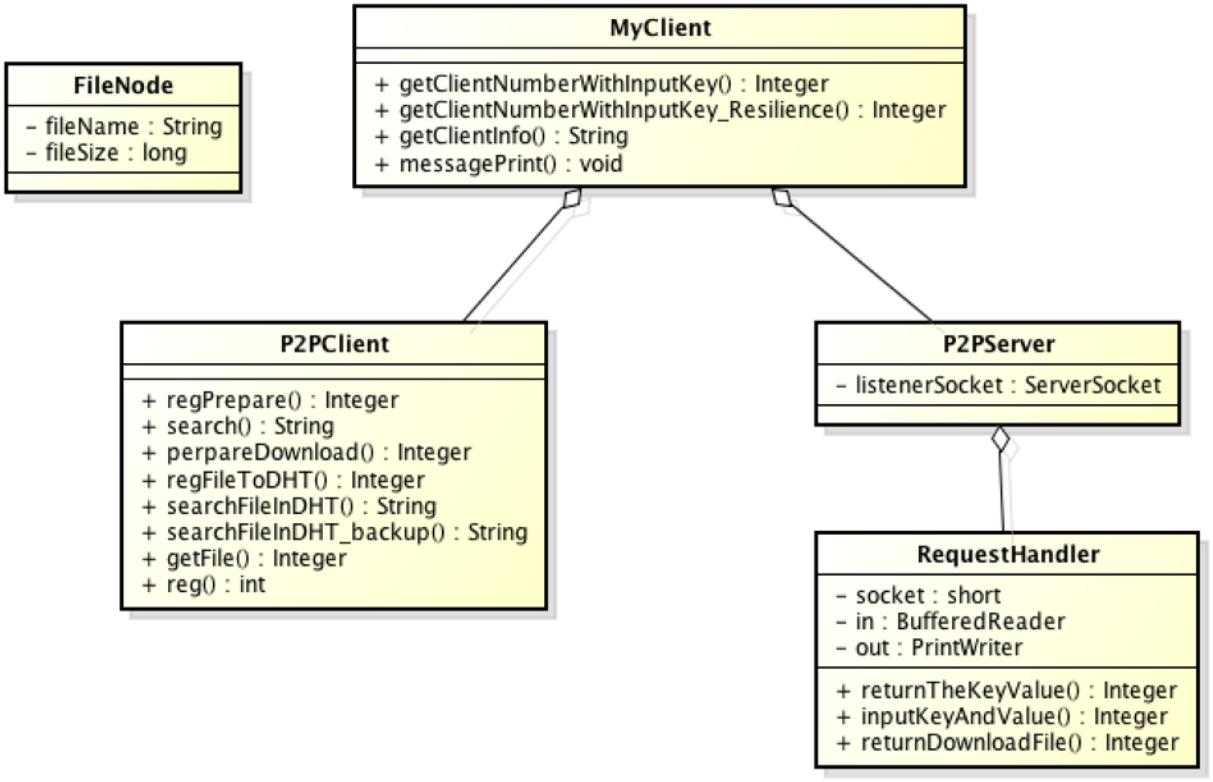
Design Document:



The class diagram for MyClient

1. Program design:

In the project, my client can be a client registering files in the DHT and searching files by inputing files name. In addition, my client can be a server to listen requests from other clients. Before running the code, user need create “UP” and “DL” folders to upload and download files.

1). As a client:

P2PClient can send register info, search files by using files name, and download the searched files.

After running the client, user need input “yes” to start registering local files into the DHT. The design can allow files registered to back up server after all clients started.

Based on the assignment 2 design, I design the fileNames as key stored in the Distributed HashTable. And the value is “fileSize,clientName,clientPort”. The client, however, can not stored the two files with the same fileName into the DHT, and the second file will be failed to register into the DHT.

method description:

a. regPrepare()

The method can request whether registering or not and start reg() after user inputing “Yes”.

b. reg()

According to the return value of getClientNumberWithInputKey() and getClientInfo(), client can get all the local files info in the “UP” . In addition, the client can find the backup client to register files Info by using getClientNumberWithInputKey_Resilience() and getClientInfo().

c. regFileToDHT()

The reg() uses the regFileToDHT() method creates connection with destination client and sends register request with “INPUT” header.

d. search()

input fileName to search in the DHT;

e. searchFileInDHT()

Using the fileName to find the destination client and create connection. Then sending search request with “SER” header and handling reply of search from the DHT.

f. searchFileInDHT_backup()

If the client fails to use searchFileInDHT() to get search reply, then using searchFileInDHT_backup() to search file info from backup client.

g. perpareDownload()

According to the return string value of the searchFileInDHT() or searchFileInDHT_backup(), perpareDownload() uses getFile() to start download

h. getFile()

Finding destination client in the DHT , creating connection, sending getFile request with “DL” header to the client, and download files.

2). As a server: receive requests and send reply

a.class of RequestHandler

handles received request(INPUT/SER/DL) with multi-thread.

If the server receives “INPUT”, it uses inputKeyValue() to store the receive info in to DHT;

If the server receives “SER”, it uses returnTheKeyValue() to reply the search request;

If the server receives “DL”, it uses returnDownloadFile() to handle download request and send file data as download reply.

3). Additional method

a. getClientNumberWithInputKey()

The method like an algorithm to locate the server by using input file name.

b. getClientNumberWithInputKey_Resilience()

To locate the backup server by using file name

c. getClientInfo()
Get the server detail using the return value of getClientNumberWithInputKey() or getClientNumberWithInputKey_backup()

d. messagePrint()
Print input string info

2. tradeoffs

a. Registering files after inputting “yes” to starting VS registering files automatically after running client

All the client cannot boots at same time, thus automatically register() cannot connect the client in DHT, if the destination client haven’t been booted. File info, however, can register destination and backup client after all the clients have been booted. To successfully register file info into DHT, I decided to register file after inputting “yes”.

b. Whether the file with same name can be registered into the DHT or not
The file name as the key stored into the DHT can make other files with same name register failed. Because I want to keep the algorithm in the assignment 2 working, easy to input and search, and reduce operation failure in the DHT.

c. the algorithm of locating a server to save the key

At first, getting the number of server from the info of “list.txt”. Change the string type key into char. Get reminder by using the char divided by the number of client.
And the reminder will be the saving location of the key.

3. Improvements and extensions

a). Allow file with same name register to the DHT

b). Create a detect Mechanism to make sure destination clients have been booted before registering or back up file info.

c). Display files stored in the DHT before search