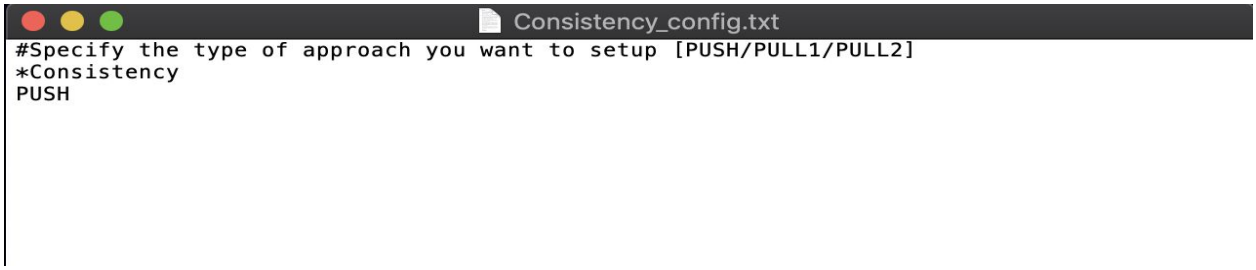
Manual

This document lists the steps needed to run us the program. Screenshots have been attached for reference. We have implemented the deliverables for both Windows OS and Mac OS. Since the previous project manual was given for Windows OS, this manual gives instructions for running everything on MacOS.
For MacOS, we have three files that need to be run for the program namely :
script.sh (to set-up the super-peers), peer_script.sh (to set up the Leaf Nodes), test_script.sh (for performance testing)
These .sh files will run only when you have the corresponding ".jar" files present ("Gnutella_P2P_ios.jar" and "javax.ws.rs-api-2.0.jar")

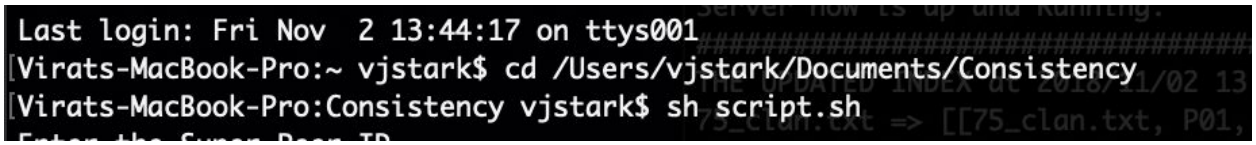
Note

The PUSH or PULL methodology which is the main requirement of our project is implemented with the help of a property file named "Consistency_config.txt". We simply specify the type of approach that we want to implement namely PUSH, PULL1 or PULL2.
PULL1 pulls the information directly through Leaf Node to Leaf Node communication whereas PULL2 involved super-peers in the communication.



Step 1

Open the terminal on Mac and navigate to the path where the folder containing the jar files is kept. For our case, the jar files are placed in the consistency folder. Once the path is set up, run the shell script using the command **"sh script.sh"** to set up the super-peers :



Step 2

Once you execute this command, a prompt will display asking the user to enter the super-peer ID. Once you enter the ID say "SP01" a message will be displayed saying that the server is now up and running. The server will now listen at the port mentioned in the property file.

Repeat this step for the number of super-peers you want to set-up (maximum of 4 in our case. For additional super-peers you will have to modify the property file accordingly.)
Please note that the ID for each super-peer should be different and each super-peer peer should be set up in a new terminal window without closing the previous windows.

Step 3

Once the servers are up and running you can leave them as they are.

Now run the command **"sh peer_script.sh"** in the same path as Step 1. Once it executes, a prompt will ask the user to enter the Peer-ID. This ID is a unique name for the peer at the Index Server. Although we have used names here, alternatively IP addresses can also be used.

```
Virats-MacBook-Pro:Consistency vjstark$ sh peer_script.sh
Enter Peer ID
P01
```

The Port No. at which the peer needs to be registered will be read from the property file.

Repeat the step for the number of leaf nodes you want to set up. Please note that the Peer-ID for each should be different.

Step 4

Once you enter the Peer IDs the command prompt will display as follows for the peer :

```
Virats-MacBook-Pro:Consistency vjstark$ sh peer_script.sh
Enter Peer ID
P01
Peer is up and Running.
Registering details of File name 75_clan.txt in Indexing Server
Registering details of File name Category~User_de_e7ec.txt in Indexing Server
Registering details of File name arrow_first.txt in Indexing Server
Registering details of File name ajax.txt in Indexing Server
Registering details of File name arrow_left.txt in Indexing Server
Registering details of File name ajaxwatch.txt in Indexing Server
Registering details of File name Category~User_nl_e3e1.txt in Indexing Server
Registering details of File name ajaxsearch.txt in Indexing Server
Registering details of File name Category~User_fr-1_d449.txt in Indexing Server
Registering details of File name Category~User_fr_fff4.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edit/Exit)
```

Step 5

The super peer will register all the leaf node files and the server screen will be visible as shown below.

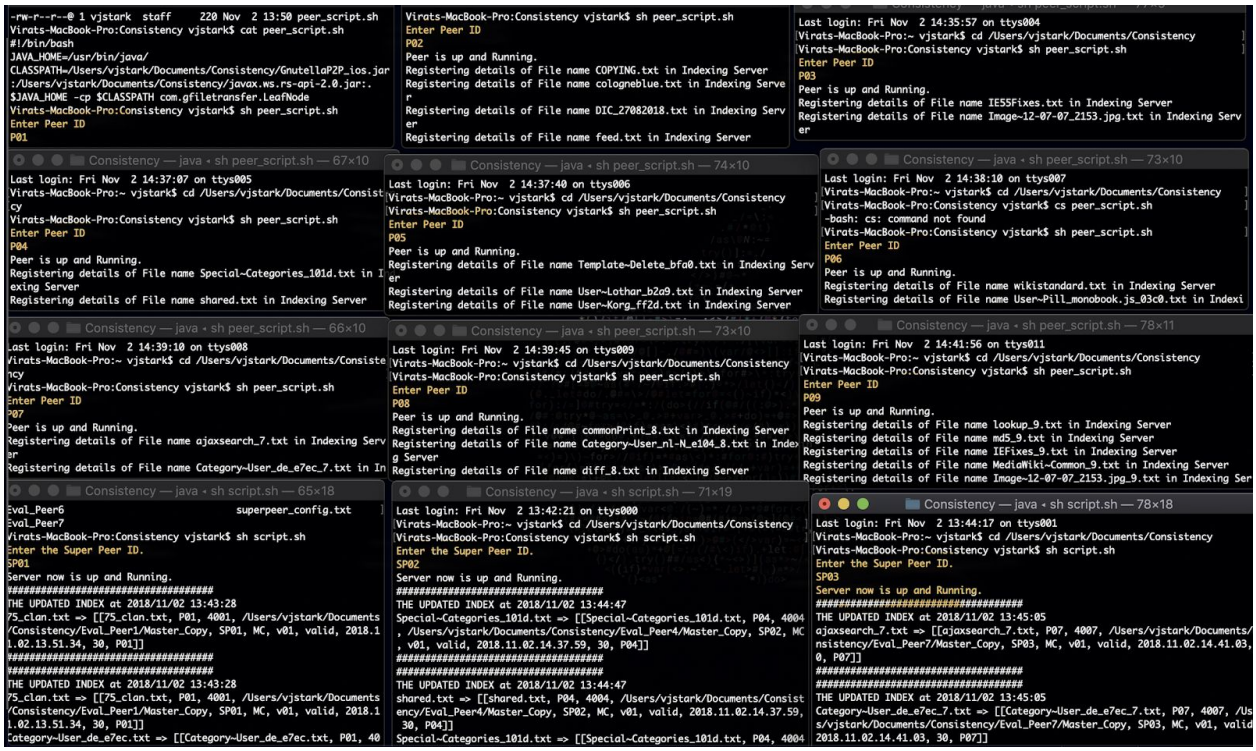
```
Enter the Super Peer ID.
SP01
Server now is up and Running.
###################################
THE UPDATED INDEX at 2018/11/02 13:43:28
75_clan.txt => [[75_clan.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, valid, 20
18.11.02.13.51.34, 30, P01]]
###################################
###################################
THE UPDATED INDEX at 2018/11/02 13:43:28
75_clan.txt => [[75_clan.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, valid, 20
18.11.02.13.51.34, 30, P01]]
Category~User_de_e7ec.txt => [[Category~User_de_e7ec.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Co
py, SP01, MC, v01, valid, 2018.11.02.13.51.34, 30, P01]]
###################################
###################################
THE UPDATED INDEX at 2018/11/02 13:43:28
75_clan.txt => [[75_clan.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, valid, 20
18.11.02.13.51.34, 30, P01]]
Category~User_de_e7ec.txt => [[Category~User_de_e7ec.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Co
py, SP01, MC, v01, valid, 2018.11.02.13.51.34, 30, P01]]
arrow_first.txt => [[arrow_first.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, v
alid, 2018.11.02.13.51.34, 30, P01]]
###################################
###################################
THE UPDATED INDEX at 2018/11/02 13:43:28
75_clan.txt => [[75_clan.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, valid, 20
18.11.02.13.51.34, 30, P01]]
Category~User_de_e7ec.txt => [[Category~User_de_e7ec.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Co
py, SP01, MC, v01, valid, 2018.11.02.13.51.34, 30, P01]]
ajax.txt => [[ajax.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, valid, 2018.11.
02.13.51.34, 30, P01]]
arrow_first.txt => [[arrow_first.txt, P01, 4001, /Users/vjstark/Documents/Consistency/Eval_Peer1/Master_Copy, SP01, MC, v01, v
alid, 2018.11.02.13.51.34, 30, P01]]
```

Step 6

Once the above steps are done you will now be able to see a prompt for the operation you want to perform(search, delete or exit) for all the peers that you have set up.

Step 7

<u>Repeat the steps 1 to 6 for all the remaining supe-peers and leaf nodes before proceeding, to the next step. A screenshot has been attached showing 3 registered super-peers and 3 corresponding leaf node for each super-peer.</u>



Note: While performing anything from Step 8 onwards keep all the tabs(servers and corresponding peers) shown above open all the time.

Step 8

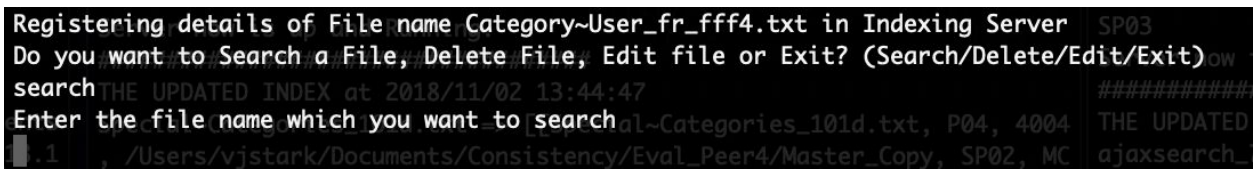
The prompt in any peer will now ask if you want to search, delete or edit a file or exit the program.

Search File

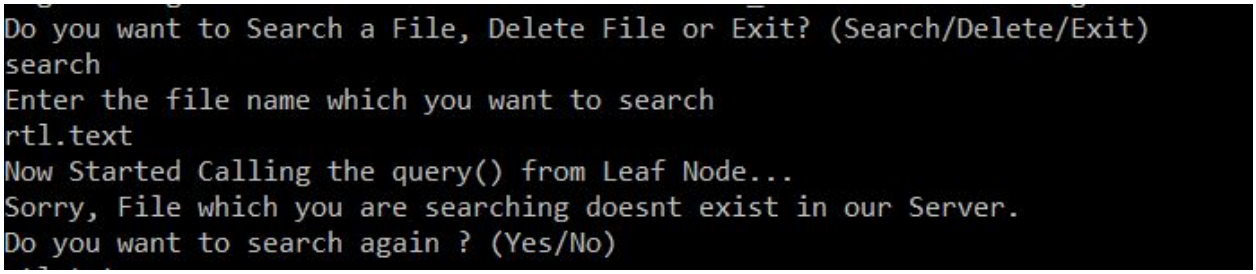
If you want to search for the file, first type search in the prompt of the leaf node where you want to search. For ex: If you want to search file using leaf node 9 (Peer ID = P09) type search in the first peer's tab.

The entry is not case sensitive.

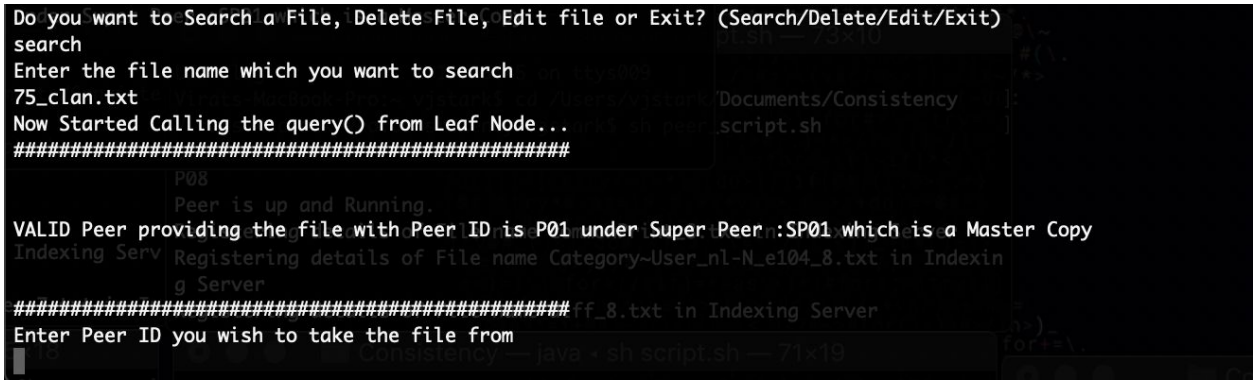
After this, the prompt will request for the file name you want to search.



We search for the file “75_clan.txt” or “rtl.txt” as an example.
The file is located at Leaf Node 1 (Peer ID = P01) and we are searching the file from Leaf Node9 (Peer ID = P09) .
If the file is not available :
It will show the message that the file doesn’t exist in our server as shown below.



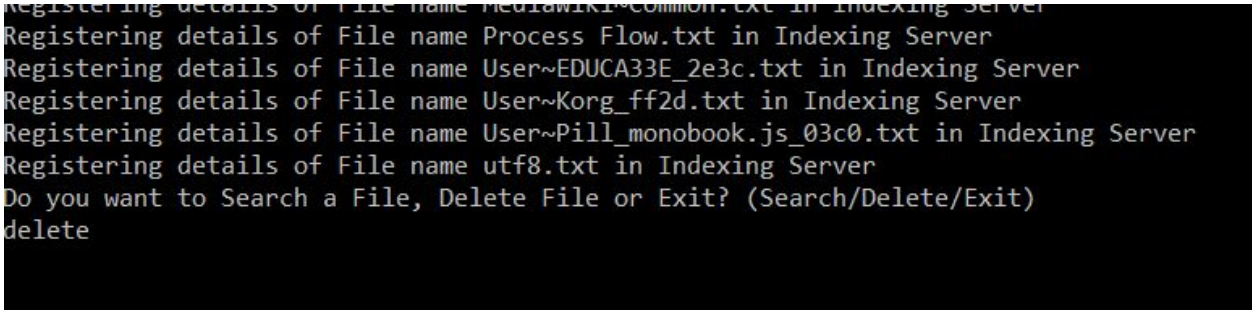
If the file is found it will display the message as follows :



The prompt will now ask you to enter the Peer ID from where you wish to download the file.
Enter the Peer-ID and download the desired File.
The screen will display the message shown below which includes cached table entry.

Delete File

To delete a file, we type delete in the prompt received at Step 5 or once you are done searching and downloading a file.



The prompt will then ask for the filename of the file you want to delete.
The file will be deleted if present and the prompt will show a message showing that the deletion was successful and ask if you want to delete more files.
If the file is not found, a message will be displayed saying “Failed to delete file”.
The prompt will return to asking if you want to delete more files.
Once you type “no” into the prompt it will return to the prompt at step 5.

```
Do you want to Search a File, Delete File or Exit? (Search/Delete/Exit)
delete
Enter the file name which you want to delete
rtl.txt
Failed to delete the File
Do you want to delete more files? (Yes/No)
yes
Enter the file name which you want to delete
dskgmwl;krgmw
Failed to delete the File
Do you want to delete more files? (Yes/No)
no
Do you want to Search a File, Delete File or Exit? (Search/Delete/Exit)
```

Edit File

To edit a file we first type edit in the prompt from the peer where we want to edit the file. For our case we edit the file in leaf Node 1 (Peer ID : P01) as shown below

```
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edi
t/Exit)
edit
Enter the file name which you want to Edit(Append)
75_clan.txt
```

We then enter the file name of the file we want to edit as shown above. The prompt then asks you to edit the file content as shown below.

```
Enter anything you want to append in this file
This is edited data that we are adding to the file
```

Once this is done simply press enter and the file will be edited. Depending on the approach an invalidate broadcast will be sent to all other leaf nodes (Push Implementation) or the other servers will poll the status of that edited file from the leaf node which has the master copy.
If you search again from any leaf node, the result returned will contain only the nodes having the latest version of the file.

Once you edit any file say “ajax.txt”, all the other leaf-nodes will receive an invalidate message as shown below :

```
Updated Cached Table Entry after insertion (File download)
ajax.txt => [ajax.txt, CC, /Users/vjstark/Documents/Consistency/Eval_Peer2/Cache_Copy/, v01, P01, valid, 60]
Do you want to search again ? (Yes/No)
Updated Cached Table Entry after updation
ajax.txt => [ajax.txt, CC, /Users/vjstark/Documents/Consistency/Eval_Peer2/Cache_Copy/, v01, P01, invalid, 60]
```

Exit

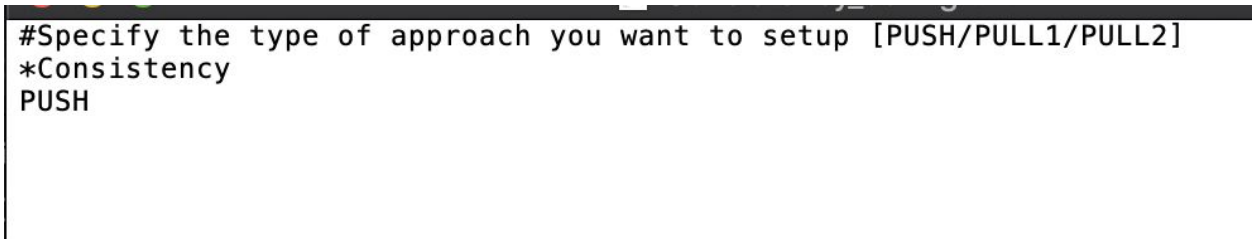
To exit the screen, you just need to type exit and press enter. The screen will close off, thus shutting down the peer. Repeat this for all the leaf nodes and super-peers that you have set up.

Step 9

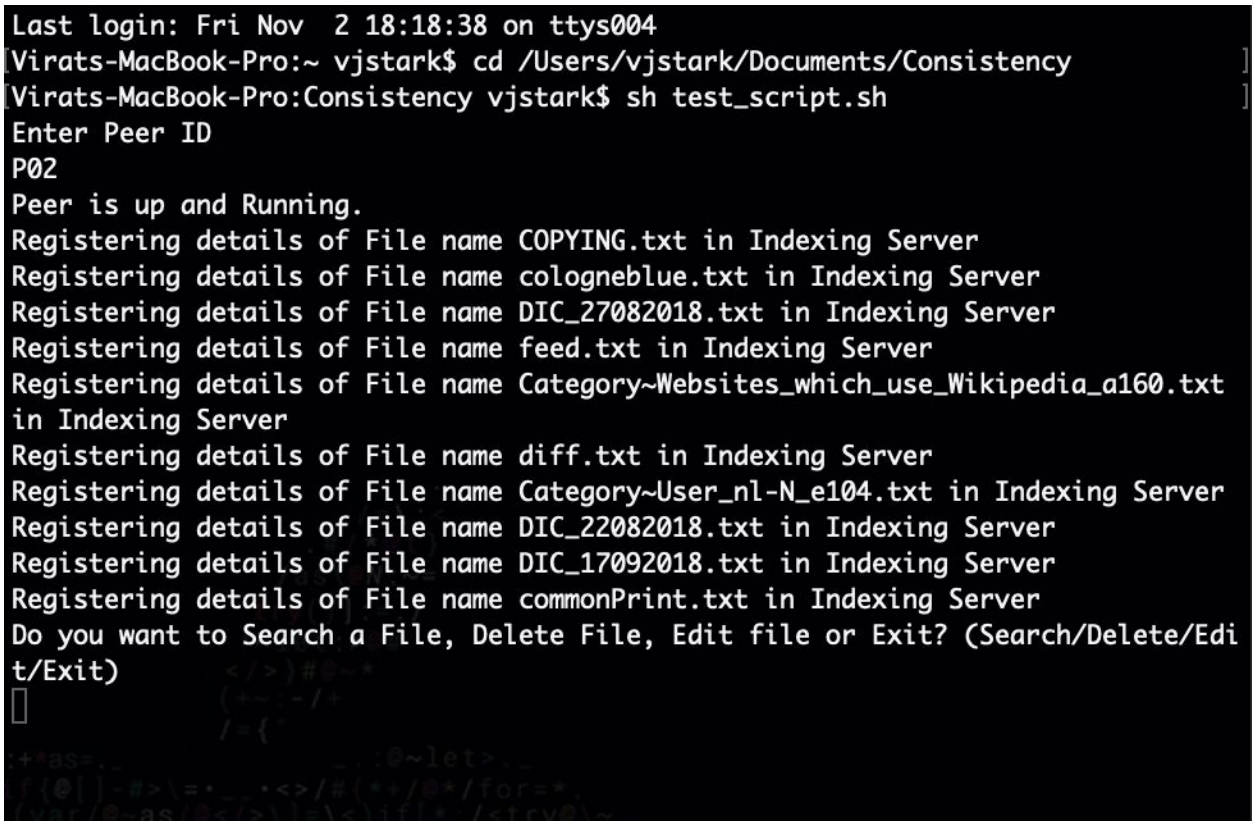
We need to test the implementation in terms of the percentage of invalid queries returned. To do this we run the “test_script.sh” file in the same path as in step 1.

PUSH APPROACH

For PUSH approach we set the value in “Consistency_Config.txt” to PUSH as shown below and save the file before closing it.

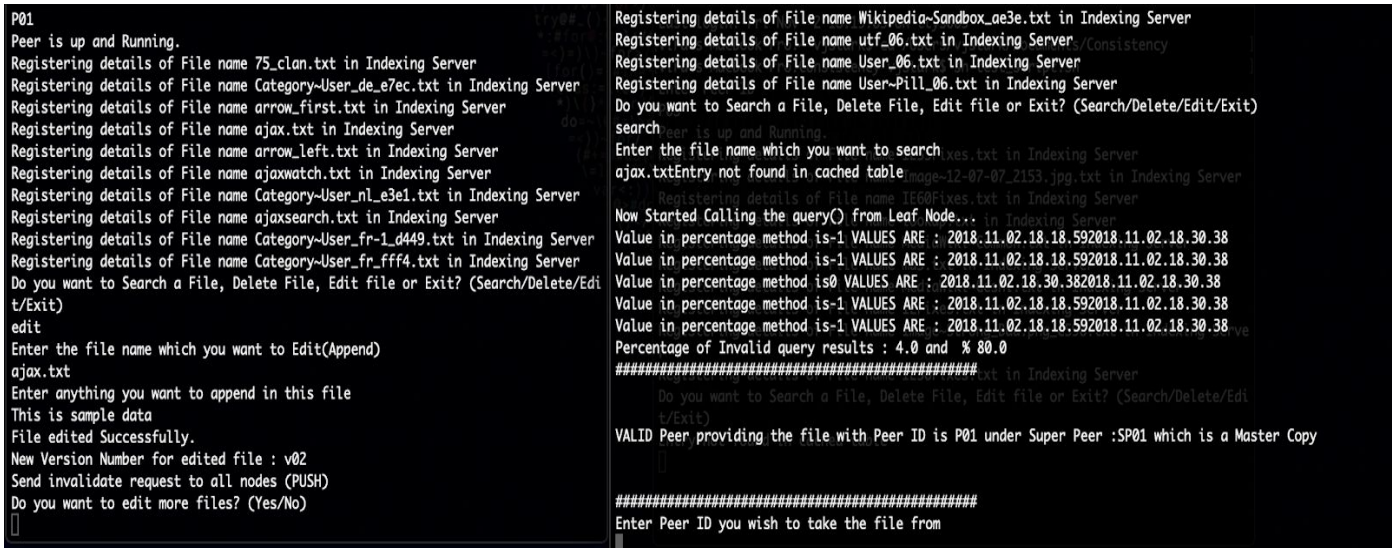


We now setup the super-peers as shown in steps 1 and 2. We set up 4 super-peers.
Then we run the “test_script.sh” file in the same path as shown in Step 1 and set up the leaf nodes 1 to 12. One sample is shown below.



Repeat the search and download steps for some of the leaf nodes.
Now edit the file you have downloaded in the leaf node with master copy. At the same time search for the file in a leaf node where it has not been downloaded. Since we already know how to search and download a file, the screenshots have not been given.

Once you search in a leaf node where the file was not downloaded after editing the file we will get the results as shown below.



The left half is where we have edited the file for P01. The right half shows the search results after editing the file. We can see that the percentage of invalid queries is 80% i.e. 4 invalid copies out of the 5 total copies that we had.

Similarly we can evaluate the results for PULL1 and PULL2 approach. The only change we need to do is in the property file as shown below.

PULL1

```
#Specify the type of approach you want to setup [PUSH/PULL1/PULL2]
*Consistency
PULL1
```

PULL2

```
#Specify the type of approach you want to setup [PUSH/PULL1/PULL2]
*Consistency
PULL2
```

END