PUSH APPROACH

<u>One peer performing query and download</u>

Percentage of Invalid queries: 80% (4 invalid copies out of 5)

Leaf-Node with Master Copy (Editing from P01 for all the 4 cases):

```
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/Edi
t/Exit)
edit
Enter the file name which you want to Edit(Append)
ajax.txt
Enter anything you want to append in this file
This is sample data
File edited Successfully.
New Version Number for edited file : v02
Send invalidate request to all nodes (PUSH)
Do you want to edit more files? (Yes/No)
```

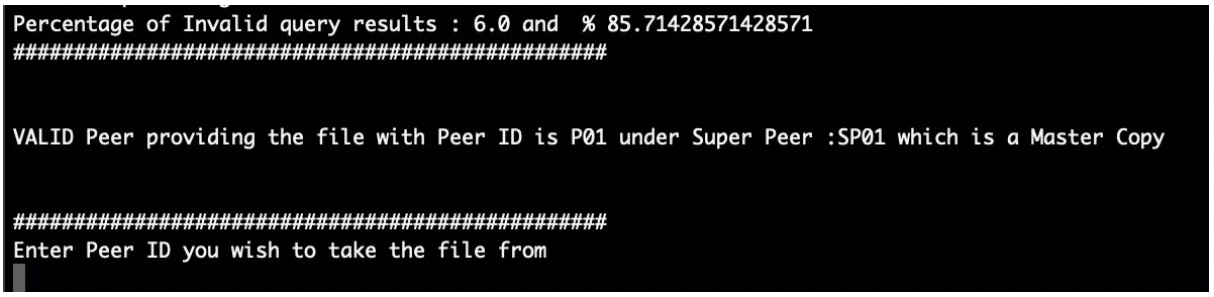
Leaf-Node where we search after editing the master copy: (Peer ID - P03)

```
Percentage of Invalid query results : 4.0 and  % 80.0
################################################

VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which is a Master Copy


################################################
Enter Peer ID you wish to take the file from
```

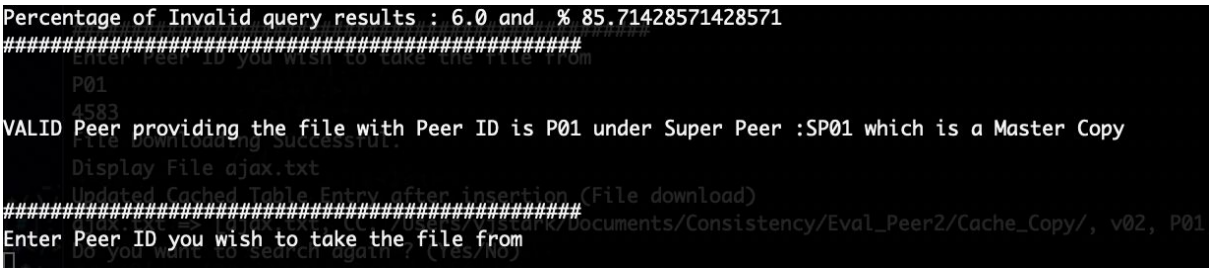
Two peers performing query and download

Percentage of Invalid queries: 85.71% (6 invalid copies out of 7)

Peer ID - P03



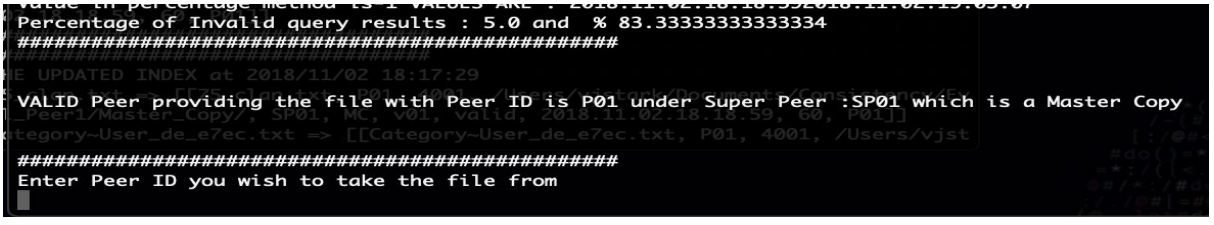
Peer ID - P06



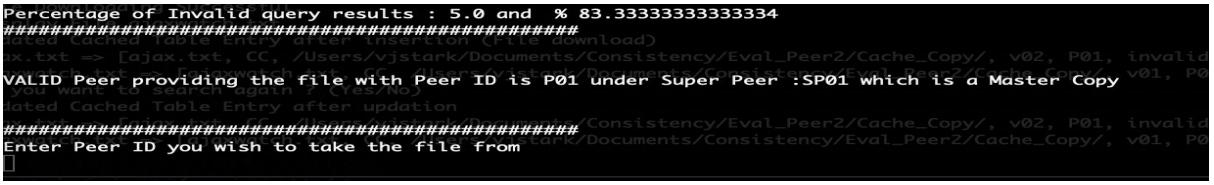
Three peers performing query and download

Percentage of Invalid queries: 83.33% (5 invalid copies out of 6)

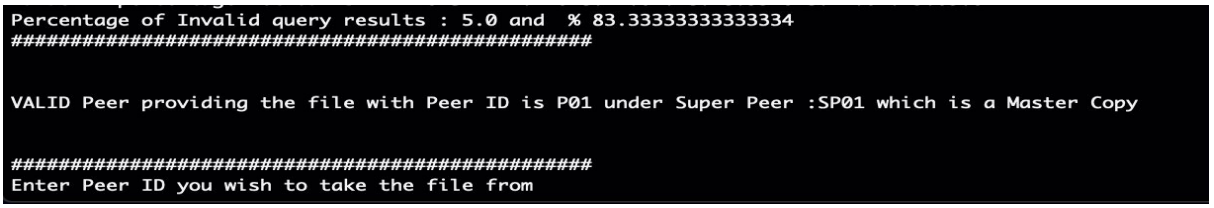
Peer ID - P03



Peer ID - P06



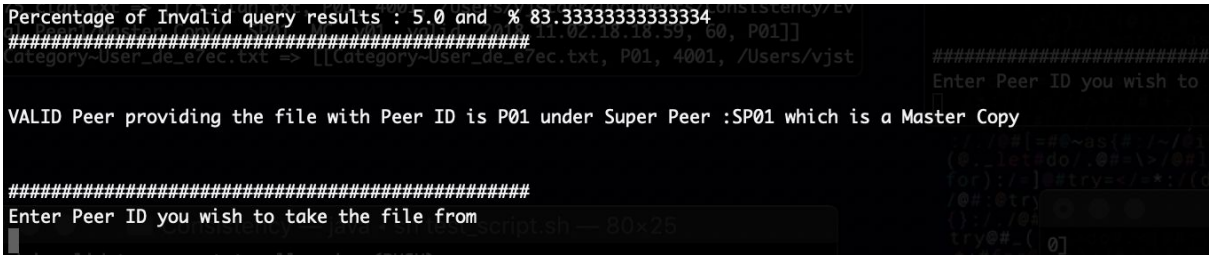
Peer ID - P08



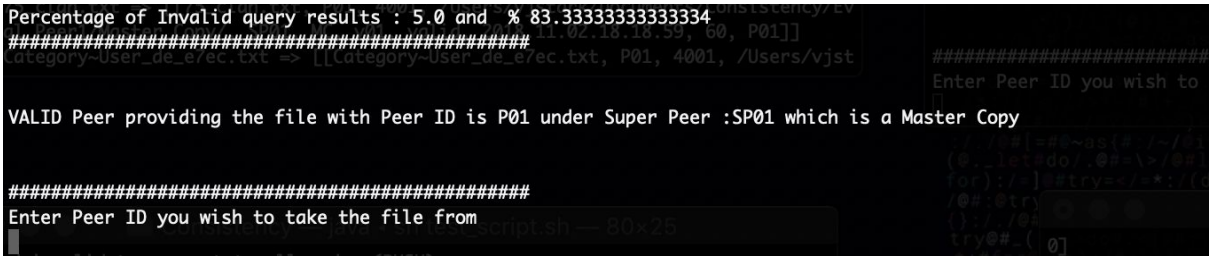
Four peers performing query and download

Percentage of Invalid queries: 83.33% (5 invalid copies out of 6)

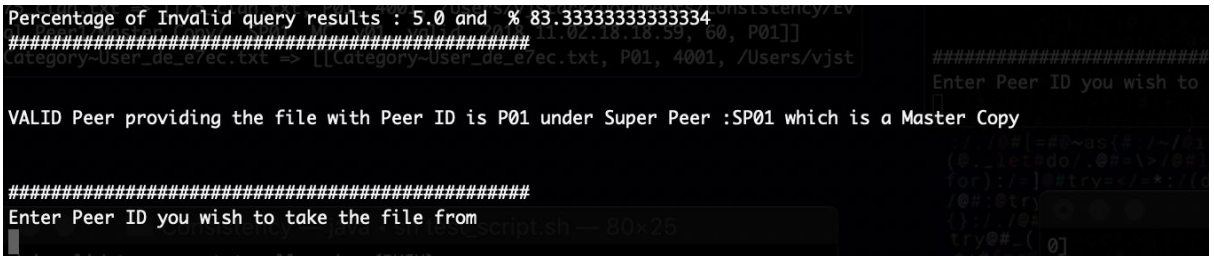
Peer ID - P02



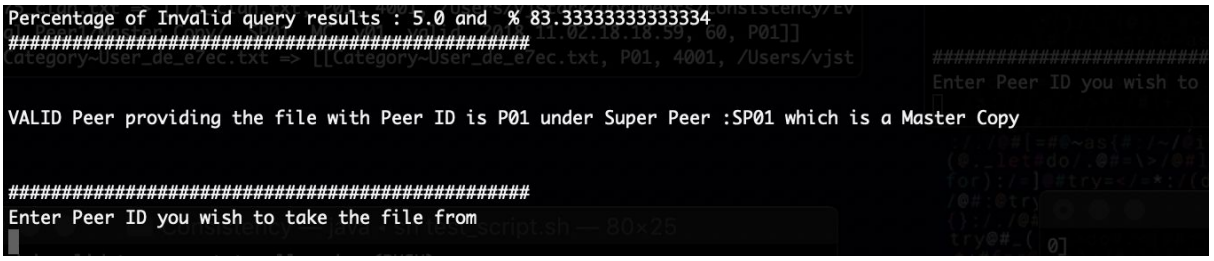
Peer ID - P03



Peer ID - P06



Peer ID - P08



PULL APPROACH

(We have evaluated this approach for TTR of 30 seconds and 60 seconds)

We edit our files from Leaf Nodes P01. We search for the files from Leaf Nodes P07, P08. The cached copies will be stored with P02,P03,P04,P05,P06 where P is the Peer ID of the Leaf Nodes.

We also keep a time difference of 20 seconds between every download operations. After master copy alteration, we wait for almost 5-10 secs to issue a new search/query hit.

Case 1a : TTR = 30 seconds

We use PULL1 approach for this.

Percentage of Invalid queries: 50% (3 invalid copies out of 6)

Result at P07 :

```
Registering details of File name Category~User_de_e7ec_7.txt in Indexing Server
Registering details of File name 75_clan_7.txt in Indexing Server
Registering details of File name ajax_7.txt in Indexing Server
Registering details of File name Category~User_fr_fff4_7.txt in Indexing Server
Registering details of File name Category~User_nl_e3e1_7.txt in Indexing Server
Registering details of File name Category~User_fr-1_d449_7.txt in Indexing Server
Registering details of File name arrow_first_7.txt in Indexing Server
Registering details of File name ajaxwatch_7.txt in Indexing Server
Registering details of File name arrow_left_7.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edit/Exit)
Search
Enter the file name which you want to search
ajax.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 3.0 and  % 50.0
##################################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which is a Master Copy


##################################################
Enter Peer ID you wish to take the file from
```

Result at P08 :

```
Registering details of File name Category~User_nl-N_e104_8.txt in Indexing Server
Registering details of File name diff_8.txt in Indexing Server
Registering details of File name DIC_22082018_8.txt in Indexing Server
Registering details of File name DIC_27082018_8.txt in Indexing Server
Registering details of File name feed_8.txt in Indexing Server
Registering details of File name COPYING_8.txt in Indexing Server
Registering details of File name cologneblue_8.txt in Indexing Server
Registering details of File name DIC_17092018_8.txt in Indexing Server
Registering details of File name Category~Websites_which_use_Wikipedia_a160_8.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edit/Exit)
Search
Enter the file name which you want to search
ajax.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 3.0 and  % 50.0
##################################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which is a Master Copy


##################################################
Enter Peer ID you wish to take the file from
```

Case 1b : TTR = 30 seconds

We use PULL2 approach for this.

Percentage of Invalid queries: 66.67% (4 invalid copies out of 6)

Result at P07 :

```
Registering details of File name Category~User_fr_fff4_7.txt in Indexing Server
Registering details of File name Category~User_nl_e3e1_7.txt in Indexing Server
Registering details of File name Category~User_fr-1_d449_7.txt in Indexing Serve
r
Registering details of File name arrow_first_7.txt in Indexing Server
Registering details of File name ajaxwatch_7.txt in Indexing Server
Registering details of File name arrow_left_7.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edi
t/Exit)
Search
Enter the file name which you want to search
ajax.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 4.0 and  % 66.66666666666666
################################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which i
s a Master Copy


################################################
Enter Peer ID you wish to take the file from
```

Result at P08 :

```
Registering details of File name DIC_27082018_8.txt in Indexing Server
Registering details of File name feed_8.txt in Indexing Server
Registering details of File name COPYING_8.txt in Indexing Server
Registering details of File name cologneblue_8.txt in Indexing Server
Registering details of File name DIC_17092018_8.txt in Indexing Server
Registering details of File name Category~Websites_which_use_Wikipedia_a160_8.tx
t in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edi
t/Exit)
search
Enter the file name which you want to search
ajax.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 4.0 and  % 66.66666666666666
################################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which i
s a Master Copy


################################################
Enter Peer ID you wish to take the file from
```

Case 2a : TTR = 60 seconds

We use PULL1 approach for this.

Result at P07 : Percentage of Invalid queries: 50% (3 invalid copies out of 6)

```
Registering details of File name Category~User_nl-N_e104_8.txt in Indexing Server
Registering details of File name diff_8.txt in Indexing Server
Registering details of File name DIC_22082018_8.txt in Indexing Server
Registering details of File name DIC_27082018_8.txt in Indexing Server
Registering details of File name feed_8.txt in Indexing Server
Registering details of File name COPYING_8.txt in Indexing Server
Registering details of File name cologneblue_8.txt in Indexing Server
Registering details of File name DIC_17092018_8.txt in Indexing Server
Registering details of File name Category~Websites_which_use_Wikipedia_a160_8.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edit/Exit)
Search
Enter the file name which you want to search
75_clan.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 3.0 and  % 50.0
##############################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which is a Master Copy


##############################################
Enter Peer ID you wish to take the file from
```

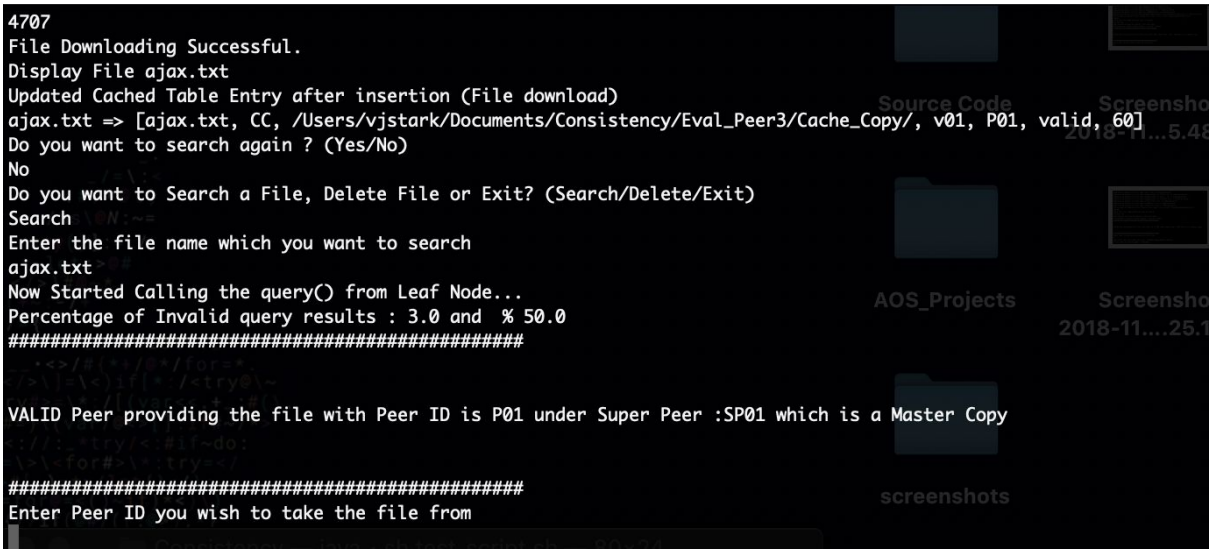
Result at P08 : Percentage of Invalid queries: 50% (3 invalid copies out of 6)

```
Registering details of File name Category~User_nl-N_e104_8.txt in Indexing Server
Registering details of File name diff_8.txt in Indexing Server
Registering details of File name DIC_22082018_8.txt in Indexing Server
Registering details of File name DIC_27082018_8.txt in Indexing Server
Registering details of File name feed_8.txt in Indexing Server
Registering details of File name COPYING_8.txt in Indexing Server
Registering details of File name cologneblue_8.txt in Indexing Server
Registering details of File name DIC_17092018_8.txt in Indexing Server
Registering details of File name Category~Websites_which_use_Wikipedia_a160_8.txt in Indexing Server
Do you want to Search a File, Delete File, Edit file or Exit? (Search/Delete/Edit/Exit)
Search
Enter the file name which you want to search
75_clan.txt
Now Started Calling the query() from Leaf Node...
Percentage of Invalid query results : 3.0 and  % 50.0
##############################################


VALID Peer providing the file with Peer ID is P01 under Super Peer :SP01 which is a Master Copy


##############################################
Enter Peer ID you wish to take the file from
```

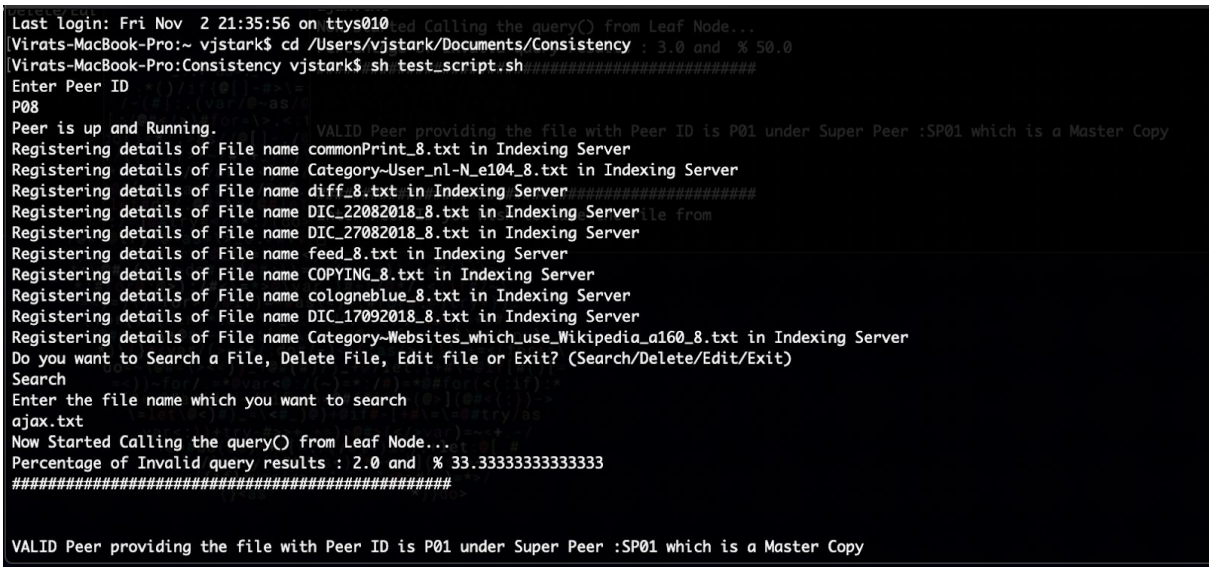
Case 2b : TTR = 60 seconds

We use PULL2 approach for this.

Result at P07 : Percentage of Invalid queries: 50% (3 invalid copies out of 6)



Result at P08 : Percentage of Invalid queries: 33.33% (2 invalid copies out of 6)



Comparison of PUSH and PULL approach in terms of their advantages, disadvantages, and applicability respectively.

We can see that the PUSH approach gives a very consistent result. The percentage of invalid queries hardly varies for different cases. However, this consistency comes at the cost of bandwidth consumption. Furthermore, this approach is scalable but the performance will degrade due to bandwidth consumption.

On the other hand, the PULL approaches utilize minimal bandwidth due to a strict refresh interval. This however comes at the cost of lack of consistency. We could see in our evaluation that if the TTR is sufficiently long the accuracy of our results degrade considerably and even reach 0 for a value of TTR which is not a desirable feature.

END