

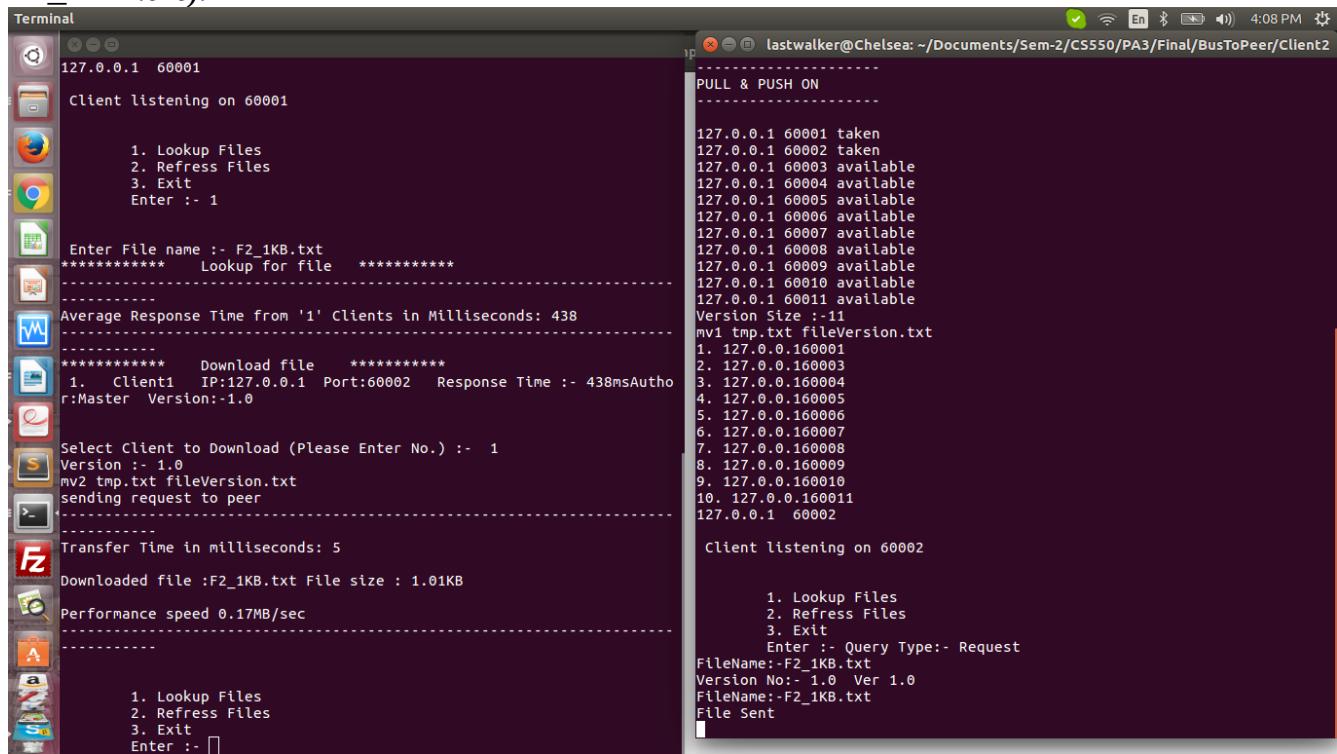
## Evaluation and Measurement

1. Testing the effectiveness of PUSH. Let one peer do queries and downloads (and refreshes) randomly and collect the query results for each query, statistically compute the percentage of invalid query results that comes back. The remaining peers simulate modifications of their own files and broadcast invalidations. Do the same thing with 2, 3, and 4 peers that do queries, downloads, etc. and collects statistics.

### BUS TOPOLOGY.

TTR value : 2 mins.

Test Case 1 : Client 1 downloads 1kb file,F2\_1KB.txt, from Client 2(master of file F2\_1KB.txt).



The image shows two terminal windows side-by-side. The left terminal window is titled 'Terminal' and shows the interaction between Client 1 and Client 2. Client 1 (IP: 127.0.0.1, Port: 60001) is listening and performing various operations like file lookup, refresh, and download. Client 2 (IP: 127.0.0.1, Port: 60002) is the master and handles file requests and sends responses. The right terminal window shows the file transfer process, including the creation of a temporary file 'tmp.txt' and its versioning. Both clients are running on the same machine, indicated by the terminal title 'lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2'.

```
Terminal
127.0.0.1 60001
Client listening on 60001

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
*****      Lookup for file      *****
-----
Average Response Time from '1' Clients in Milliseconds: 438
-----
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 438msAutho
r:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv1 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

-----
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
PULL & PUSH ON
-----
127.0.0.1 60001 taken
127.0.0.1 60002 taken
127.0.0.1 60003 available
127.0.0.1 60004 available
127.0.0.1 60005 available
127.0.0.1 60006 available
127.0.0.1 60007 available
127.0.0.1 60008 available
127.0.0.1 60009 available
127.0.0.1 60010 available
127.0.0.1 60011 available
Version Size :-11
mv1 tmp.txt fileVersion.txt
1. 127.0.0.160001
2. 127.0.0.160003
3. 127.0.0.160004
4. 127.0.0.160005
5. 127.0.0.160006
6. 127.0.0.160007
7. 127.0.0.160008
8. 127.0.0.160009
9. 127.0.0.160010
10. 127.0.0.160011
127.0.0.1 60002

Client listening on 60002

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F2_1KB.txt
Version No:- 1.0 Ver 1.0
FileName:-F2_1KB.txt
File Sent
```

## Test Case 2 : Client 2 modifies the file F2\_1KB.txt (Push)

The screenshot shows two terminal windows side-by-side. The left window is titled 'Terminal' and shows the client's menu and file download process. The right window is titled 'lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2' and shows the server's log output, which includes a list of available files and their versions.

```
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 438
*****
Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 438msAutho
r:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
File Name :F2_1KB.txt Refresh with Master
```

```
127.0.0.1 60001 taken
127.0.0.1 60002 taken
127.0.0.1 60003 available
127.0.0.1 60004 available
127.0.0.1 60005 available
127.0.0.1 60006 available
127.0.0.1 60007 available
127.0.0.1 60008 available
127.0.0.1 60009 available
127.0.0.1 60010 available
127.0.0.1 60011 available
Version Size :-11
mv1 tmp.txt fileVersion.txt
1. 127.0.0.1.160001
2. 127.0.0.1.160003
3. 127.0.0.1.160004
4. 127.0.0.1.160005
5. 127.0.0.1.160006
6. 127.0.0.1.160007
7. 127.0.0.1.160008
8. 127.0.0.1.160009
9. 127.0.0.1.160010
10. 127.0.0.1.160011
127.0.0.1 6002

Client listening on 60002
```

```
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F2_1KB.txt
Version No:- 1.0 Ver 1.0
FileName:-F2_1KB.txt
File Sent
Slave Call this function
Version Size :-11
mv1 tmp.txt fileVersion.txt
Slave Call this function
```

## Test Case 3 : Client 4 lookup F2\_1.txt.

The screenshot shows three terminal windows. The left window is titled 'Terminal' and shows the client's menu and file download process. The middle window is titled 'lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2' and shows the server's log output, which includes a list of available files and their versions. The right window is titled 'lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client4' and shows the client's response to a file lookup query.

```
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 438
*****
Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 438msAutho
r:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
File Name :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:-F2_1.txt
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:-F2_1KB.txt
```

```
FileName:-F2_1KB.txt
Version No:- 1.0 Ver 1.0
FileName:-F2_1KB.txt
File Sent
Slave Call this function
Version Size :-11
mv1 tmp.txt fileVersion.txt
Slave Call this function
Slave Call this function
Query Type:- Request
FileName:-F2_1.txt
Slave Call this function
Query Type:- Request
FileName:-F2_1KB.txt
Version No:- 1.1 Ver 1.1
```

```
Enter File name :- F2_1.txt
***** Lookup for file *****
File Not Found
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 154
*****
Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 154msAutho:Ma
Version:-1.1

Select Client to Download (Please Enter No.) :-
```

Here the Client 1 didn't response as it has an invalid copy of the file F2\_1KB.txt.

## Test Case 4 : Client 1 use the pull request with refresh function.

```

Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
*****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 438msAutho
r:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:F2_1.txt
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:-F2_1KB.txt
FileName :F2_1KB.txt Refresh with Master
2
List of invalid Files
1. File Name: F2_1KB.txt IP:127.0.0.1 Port:60002
Select File to Download (Please Enter No.) OR Press '0' to Update All
:- File Name :F2_1KB.txt Refresh with Master

```

```

lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
File Name:-F2_1KB.txt
File Sent
Slave Call this function
Version Size :-11
mv1 tmp.txt fileVersion.txt
Slave Call this function
Slave Call this function
Query Type:- Request
File Name:-F2_1.txt
Slave Call this function
Query Type:- Request
File Name:-F2_1KB.txt
Version No:- 1.1 Ver 1.1
Slave Call this function
Slave Call this function
[ ]

```

```

Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client4
Enter File name :- F2_1.txt
*****
File Not Found
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
*****
File Not Found
-----
Average Response Time from '1' Clients in Milliseconds: 154
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 154msAutho:Ma
Version:-1.1

Select Client to Download (Please Enter No.) :- 

```

Here when the Client 1 request a refresh pull function it can either download a new file or press zero to refresh the invalid files which is displayed.  
On selectin 0 it update the invalid file and makes it valid.

```

Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:F2_1.txt
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName:-F2_1KB.txt
FileName :F2_1KB.txt Refresh with Master
2
List of invalid Files
1. File Name: F2_1KB.txt IP:127.0.0.1 Port:60002
Select File to Download (Please Enter No.) OR Press '0' to Update All
:- File Name :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
0
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 

```

```

lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
Version Size :-11
mv1 tmp.txt fileVersion.txt
Slave Call this function
Slave Call this function
Query Type:- Request
File Name:-F2_1.txt
Slave Call this function
Query Type:- Request
File Name:-F2_1KB.txt
Version No:- 1.1 Ver 1.1
Slave Call this function
Slave Call this function
Slave Call this function
FileName:-F2_1KB.txt
File Sent
[ ]

Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client4
Enter File name :- F2_1.txt
*****
File Not Found
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F2_1KB.txt
*****
File Not Found
-----
Average Response Time from '1' Clients in Milliseconds: 154
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 154msAutho:Ma
Version:-1.1

Select Client to Download (Please Enter No.) :- 

```

Here it downloads the new version of F2\_1KB.txt from the master of that file i.e. Client2

Test Case 5 : Client 4 downloads the file F2\_1KB.txt from the master which was the only one available as Client 1 had an invalid file before refresh.

The screenshot shows two terminal windows. The left window (Client2) displays a file transfer process where a file is being sent from the master to a peer. The right window (Client4) shows Client4 requesting the file from Client2. Both clients report a transfer time of approximately 6 milliseconds and a performance speed of 0.14MB/sec.

```
Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
Query Type:- Request
FileName:-F2_1KB.txt
Slave Call this function
Query Type: Request
FileName:-F2_1KB.txt
Version No:- 1.1 Ver 1.1
Slave Call this function
Slave Call this function
Slave Call this function
FileName:-F2_1KB.txt
File Sent
Slave Call this function
Slave Call this function
FileName:-F2_1KB.txt
File Sent

lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client4
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time -- 154msAuthor:Master
Version:-1.1

Select Client to Download (Please Enter No.) :- 1
Version :- 1.1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 6
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.14MB/sec
-----
```

```
Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
Transfer Time in milliseconds: 5
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F2_1KB.txt IP:127.0.0.1 Port:60002

Select File to Download (Please Enter No.) OR Press '0' to Update All
:- FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
0
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
-----
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client4
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time -- 154msAuthor:Master
Version:-1.1
Select Client to Download (Please Enter No.) :- 1
Version :- 1.1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 6
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.14MB/sec
-----
```

Test Case 6 : Client 3 downloads File2\_1KB.txt from non master Client i.e. Client 1 after the above tests.

The screenshot shows two terminal windows. The left window (Client1) displays a file transfer process where a file is being sent from the master to a peer. The right window (Client3) shows Client3 requesting the file from Client1. Both clients report a transfer time of approximately 6 milliseconds and a performance speed of 0.14MB/sec.

```
Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
Performance speed 0.17MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F2_1KB.txt Refresh with Master
mv tmp.txt fileVersion.txt
FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F2_1KB.txt IP:127.0.0.1 Port:60002

Select File to Download (Please Enter No.) OR Press '0' to Update All
:- FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
0
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
-----
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client3
Enter File name :- F2_1KB.txt
***** Lookup for file *****
-----
Average Response Time from '2' Clients in Milliseconds: 162
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time -- 161msAuthor:Master
Version:-1.1
2. Client2 IP:127.0.0.1 Port:60004 Response Time -- 162msAuthor:Slave
Version:-1.1

Select Client to Download (Please Enter No.) :- 1
Select Client to Download (Please Enter No.) :- 1
Version :- 1.1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 6
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.14MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F2_1KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
Query Type:- Request
FileName :F2_1KB.txt Refresh with Master
Version No:- 1.1 Ver 1.1
```

```
Terminal lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client3
-----
```

Performance speed 0.17MB/sec

-----

1. Lookup Files  
2. Refresh Files  
3. Exit

Enter :- FileName :F2\_1KB.txt Refresh with Master

mv tmp.txt fileVersion.txt

FileName :F2\_1KB.txt Refresh with Master

FileName :F2\_1KB.txt Refresh with Master

Query Type:- Request

FileName:F2\_1.txt

FileName :F2\_1KB.txt Refresh with Master

Query Type:- Request

FileName:F2\_1KB.txt

FileName :F2\_1KB.txt Refresh with Master

2

List of invalid Files

1. FileName: F2\_1KB.txt IP:127.0.0.1 Port:60002

Select File to Download (Please Enter No.) OR Press '0' to Update All

:- FileName :F2\_1KB.txt Refresh with Master

FileName :F2\_1KB.txt Refresh with Master

0

sending request to peer

-----

1. Lookup Files  
2. Refresh Files  
3. Exit

Enter :- FileName :F2\_1KB.txt Refresh with Master

Query Type:- Request

FileName:F2\_1KB.txt

FileName :F2\_1KB.txt Refresh with Master

```
-----
```

Average Response Time from '2' Clients in Milliseconds: 162

\*\*\*\*\* Download file \*\*\*\*\*

1. Client1 IP:127.0.0.1 Port:60002 Response Time :: 161ms Author:Master Version:1.1

2. Client2 IP:127.0.0.1 Port:60004 Response Time :: 162ms Author:Slave Version:1.1

Select Client to Download (Please Enter No.) :- 2

Version :- 1.1

mv2 tmp.txt fileVersion.txt

sending request to peer

-----

Transfer Time in milliseconds: 4

Downloaded file :F2\_1KB.txt File size : 1.01KB

Performance speed 0.24MB/sec

-----

Performance speed 0.14MB/sec

-----

1. Lookup Files  
2. Refresh Files  
3. Exit

Enter :- FileName :F2\_1KB.txt Refresh with Master

FileName :F2\_1KB.txt Refresh with Master

Query Type:- Request

FileName:F2\_1KB.txt

Version No:- 1.1 Ver 1.1

FileName :F2\_1KB.txt Refresh with Master

FileName:-F2\_1KB.txt

File Sent

Test Case 7 : Client 1 downloads (and refreshes) randomly(before this test we set everything to original configuration.

[Note: in every TTR value the peers run the refresh function which check the consistency of the file using the version number of the file from the master of that file. Hence after every TTR values the screen will display a message \*\*\* Refresh function called \*\*\*\* or \*\*\*\* Refresh with Master\*\*\*\*]

## Downloads:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
7. 127.0.0.160008
8. 127.0.0.160009
9. 127.0.0.160010
10. 127.0.0.160011
127.0.0.1 60001

Client listening on 60001

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F3_10KB.txt
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 491
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60003 Response Time :- 491msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
-----
Downloaded file :F3_10KB.txt File size : 10.08KB
Performance speed 1.82MB/sec
-----

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F10_100KB.txt
***** Lookup for file *****
File Not Found

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F3_10KB.txt Refresh with Master
1

Enter File name :- F2_1KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 200
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60002 Response Time :- 200msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F2_1KB.txt File size : 1.01KB
Performance speed 0.24MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F4_100KB.txt
***** Lookup for file *****
File Not Found

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- FileName :F3_10KB.txt Refresh with Master
F4_100kb.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 163
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60004 Response Time :- 163msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F4_100kb.txt File size : 100.78KB
Performance speed 21.56MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- 1

Enter File name :- F4_100KB.txt
***** Lookup for file *****
File Not Found

      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- 1

Enter File name :- FileName :F3_10KB.txt Refresh with Master
F4_100kb.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 163
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60004 Response Time :- 163msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F4_100kb.txt File size : 100.78KB
Performance speed 21.56MB/sec
-----
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- 1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F4_100kb.txt File size : 100.78KB
Performance speed 21.56MB/sec
-----
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- 1. Lookup Files Refresh with Master
1

Enter File name :- F6_9KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 138
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 138msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_9KB.txt File size : 9.07KB
Performance speed 1.86MB/sec
-----
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- 1
```

Refreshes: The files downloaded are now modified by master peers of that file.

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
*****      Lookup for file *****

Average Response Time from '1' Clients in Milliseconds: 138
-----  
*****      Download file *****  
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 138msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_9KB.txt File size : 9.07KB
Performance speed 1.86MB/sec
-----  
  
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****      Invalidate Called *****  
FileName :F6_9KB.txt Refresh with Master
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****      Invalidate Called *****  
*****      Invalidate Called *****  
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_9KB.txt File size : 9.07KB
Performance speed 1.86MB/sec
-----  
  
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****      Invalidate Called *****  
FileName :F6_9KB.txt Refresh with Master
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****      Invalidate Called *****  
*****      Invalidate Called *****  
FileName :F3_10KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F3_10KB.txt IP:127.0.0.1 Port:60003
2. FileName: F2_1KB.txt IP:127.0.0.1 Port:60002
3. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F6_9KB.txt Refresh with Master
FileName :F3_10KB.txt Refresh with Master
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
 1. Lookup Files
 2. Refresh Files
 3. Exit
      Enter :-  FileName :F3_10KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
FileName :F6_9KB.txt  Refresh with Master
FileName :F3_10KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
*****
***** Invalidate Called *****
FileName :F6_9KB.txt  Refresh with Master
FileName :F3_10KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
FileName :F6_9KB.txt  Refresh with Master
*****
***** Invalidate Called *****
FileName :F3_10KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
2
List of invalid Files
1. FileName: F3_10KB.txt  IP:127.0.0.1  Port:60003
2. FileName: F2_1KB.txt  IP:127.0.0.1  Port:60002
3. FileName: F6_9KB.txt  IP:127.0.0.1  Port:60006
Fz
0
sending request to peer
sending request to peer
sending request to peer

A
 1. Lookup Files
 2. Refresh Files
 3. Exit
      Enter :-  FileName :F6_9KB.txt  Refresh with Master
```

We have refreshed all the updated files by their master now client 1 don't invalid file. If we do 2 again no files with an invalid status is appeared.

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
Client listening on 60001

 1. Lookup Files
 2. Refresh Files
 3. Exit
      Enter :-  FileName :F3_10KB.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F6_9KB.txt  Refresh with Master
FileName :F3_10KB.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
FileName :F6_9KB.txt  Refresh with Master
2
List of invalid Files
1. FileName: F3_10KB.txt  IP:127.0.0.1  Port:60003
2. FileName: F2_1KB.txt  IP:127.0.0.1  Port:60002
3. FileName: F6_9KB.txt  IP:127.0.0.1  Port:60006
Select File to Download (Please Enter No.) OR Press '0' to Update All :-  0
sending request to peer
sending request to peer
sending request to peer

A
 1. Lookup Files
 2. Refresh Files
 3. Exit
      Enter :-  FileName :F3_10KB.txt  Refresh with Master
FileName :F2_1KB.txt  Refresh with Master
FileName :F4_100kb.txt  Refresh with Master
FileName :F6_9KB.txt  Refresh with Master
2
List of invalid Files
 1. Lookup Files
 2. Refresh Files
 3. Exit
      Enter :-  
```

Test Case 8 : Client 1,2,8 and 10 downloads (and refreshes) randomly(before this test we set everything to original configuration.

## Downloads:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
*****
*****Refresh function called*****
Version Size :-11
***** Invalidate Called *****
*****
*****Refresh function called*****
*****Refresh function called*****
FileName:-F2_1KB.txt
File Sent
*****
*****Refresh function called*****
FileName:-F2_1KB.txt
File Sent
*****
*****Refresh function called*****
*****Refresh function called*****
*****Refresh function called*****
1

Enter File name :- F6_9KB.txt
***** Lookup for file *****
E Average Response Time from '2' Clients in Milliseconds: 138
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 71msAuthor:Master Version:-1.1
2. Client2 IP:127.0.0.1 Port:60001 Response Time :- 206msAuthor:Slave Version:-1.1
>-
Select Client to Download (Please Enter No.) :- *****
1
FZ Version :: 1.1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 2
Downloaded file :F6_9KB.txt File size : 9.08KB
Performance speed 3.37MB/sec
-----
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F4_100kb.txt
***** Lookup For file *****
E Average Response Time from '2' Clients in Milliseconds: 126
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60001 Response Time :- 97msAuthor:Slave Version:-1.0
2. Client2 IP:127.0.0.1 Port:60004 Response Time :- 156msAuthor:Master Version:-1.0
>-
Select Client to Download (Please Enter No.) :- 2
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 3
Downloaded file :F4_100kb.txt File size : 100.78KB
Performance speed 26.62MB/sec
-----

FZ 1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F7_4KB.txt
***** Lookup For file *****
E Average Response Time from '1' Clients in Milliseconds: 128
-----
```

```
lastwalker@Chelsea:~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
-----
Transfer Time in milliseconds: 3
Downloaded file :F4_100kb.txt File size : 100.78KB
Performance speed 26.62MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F7_4KB.txt
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 128
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60007 Response Time :- 128msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 5
Downloaded file :F7_4KB.txt File size : 4.03KB
Performance speed 0.69MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :. *****Refresh function called*****FileName :F6_9KB.txt Refresh with Master
```

```
lastwalker@Chelsea:~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
-----
FileName:-F10_100KB
Query Type:- Request
FileName:-F10_100KB.txt
Query Type:- Request
FileName:-F2_1KB.txt
Query Type:- Request
FileName:-F4_100KB.txt
Query Type:- Request
FileName:-F4_100kb.txt
Query Type:- Request
FileName:-F6_9KB.txt
*****
Invalidate Called *****
*****
Invalidate Called *****
*****
Invalidate Called *****
Query Type:- Request
FileName:-F6_9KB.txt
Query Type:- Request
FileName:-F4_100kb.txt
Query Type:- Request
FileName:-F7_4KB.txt
1

Enter File name :- F9_6KB.txt
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 138
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60009 Response Time :- 138msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version : 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F9_6KB.txt File size : 6.05KB
Performance speed 1.27MB/sec
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F9_6KB.txt File size : 6.05KB
Performance speed 1.27MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F10_5KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 92
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60010 Response Time :- 92msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 3
Downloaded file :F10_5KB.txt File size : 5.04KB
Performance speed 1.5MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client10
*****      Invalidate Called      *****
*****      Invalidate Called      *****
*****      Invalidate Called      *****
Query Type:- Request
FileName:-F6_9KB.txt
Query Type:- Request
FileName:-F4_100kb.txt
Query Type:- Request
FileName:-F7_4KB.txt
Query Type:- Request
FileName:-F9_6KB.txt
Query Type:- Request
FileName:-F10_5KB.txt
Version No:- 1.0 Ver 1.0
FileName:-F10_5KB.txt
File Sent
1

Enter File name :- F6_9KB.txt
*****      Lookup for file      *****
Average Response Time from '3' Clients in Milliseconds: 191
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60001 Response Time :- 157msAuthor:Slave Version:-1.1
2. Client2 IP:127.0.0.1 Port:60006 Response Time :- 207msAuthor:Master Version:-1.1
3. Client3 IP:127.0.0.1 Port:60002 Response Time :- 210msAuthor:Slave Version:-1.1

Select Client to Download (Please Enter No.) :- 2
Version :- 1.1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 10
Downloaded file :F6_9KB.txt File size : 9.08KB
Performance speed 0.83MB/sec
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client10
sending request to peer
-----
Transfer Time in milliseconds: 10
Downloaded file :F6_9KB.txt File size : 9.08KB
Performance speed 0.83MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F1_10KB.txt
***** Lookup for file *****
Average Response Time from '1' Clients in Milliseconds: 126
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60001 Response Time :- 126ms Author:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1*****Refresh function called*****
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 6
Downloaded file :F1_10KB.txt File size : 10.08KB
Performance speed 1.6MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

## Refreshes:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 3
Downloaded file :F10_5KB.txt File size : 5.04KB
Performance speed 1.5MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F6_9KB.txt
FileName :F9_6KB.txt Refresh with Master
Query Type:- Request
FileName:-F1_10KB.txt
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
*****
Invalidate Called *****
FileName :F10_5KB.txt Refresh with Master
*****
Invalidate Called *****
*****
Invalidate Called *****
*****
Invalidate Called *****
2
List of invalid Files
1. FileName: F9_6KB.txt IP:127.0.0.1 Port:60009
2. FileName: F10_5KB.txt IP:127.0.0.1 Port:60010

Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F9_6KB.txt Refresh with Master
1
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 3
Downloaded file :F10_5KB.txt File size : 5.04KB
Performance speed 1.5MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F6_9KB.txt
FileName :F9_6KB.txt Refresh with Master
Query Type:- Request
FileName:F1_10KB.txt
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
*****
Invalidate Called *****
FileName :F10_5KB.txt Refresh with Master
*****
Invalidate Called *****
*****
Invalidate Called *****
*****
Invalidate Called *****
2
List of invalid Files
1. FileName: F9_6KB.txt IP:127.0.0.1 Port:60009
2. FileName: F10_5KB.txt IP:127.0.0.1 Port:60010
Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client10
Performance speed 1.6MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh Function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****
Invalidate Called *****
*****
Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
*****
Invalidate Called *****
*****
Invalidate Called *****
Version Size :-13
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName:-F10_5KB.txt
File Sent
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006
2. FileName: F1_10KB.txt IP:127.0.0.1 Port:60001
Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F6_9KB.txt Refresh with Master
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
Version Size :-15
*****Refresh function called*****
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
***** Invalidate Called *****
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName :F1_10KB.txt
File Sent
*****Refresh function called*****
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh Function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F4_100kb.txt Refresh with Master
***** Invalidate Called *****
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
***** Invalidate Called *****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh Function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
*****Refresh function called*****
FileName :F6_9KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F7_4KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

Hence in the above screen shots we are doing the “push” function of the implementation and message “\*\*\*\*\*Invalidate called\*\*\*\*\*” is printed when ever there is a change in the master copy of a particular file.

## Test case 9:

2. Testing the effectiveness of PULL. Let 2 to 3 peers do queries, downloads, and refreshes. The remaining peers simulate modifications using an exponential distribution. Collect statistics of the percentage of invalid query results.

### Downloads1:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 3
Downloaded file :F10_5KB.txt File size : 5.04KB
Performance speed 1.5MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:F6_9KB.txt
FileName :F9_6KB.txt Refresh with Master
Query Type:- Request
FileName:F1_10KB.txt
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
*****
***** Invalidate Called *****
FileName :F10_5KB.txt Refresh with Master
*****
***** Invalidate Called *****
*****
***** Invalidate Called *****
*****
***** Invalidate Called *****
2
List of invalid Files
1. FileName: F9_6KB.txt IP:127.0.0.1 Port:60009
2. FileName: F10_5KB.txt IP:127.0.0.1 Port:60010
Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
```

### Refresh1(PULL):

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client8
Query Type:- Request
FileName:F1_10KB.txt
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
*****
***** Invalidate Called *****
FileName :F10_5KB.txt Refresh with Master
*****
***** Invalidate Called *****
*****
***** Invalidate Called *****
*****
***** Invalidate Called *****
2
List of invalid Files
1. FileName: F9_6KB.txt IP:127.0.0.1 Port:60009
2. FileName: F10_5KB.txt IP:127.0.0.1 Port:60010
Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F9_6KB.txt Refresh with Master
FileName :F10_5KB.txt Refresh with Master
FileName :F9_6KB.txt Refresh with Master
0
sending request to peer
sending request to peer

1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  FileName :F10_5KB.txt Refresh with Master
2
List of invalid Files

1. Lookup Files
2. Refresh Files
3. Exit
Enter :-
```

## Download 2:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client10
Performance speed 1.6MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Invalidate Called *****
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
*****Invalidate Called *****
*****Invalidate Called *****
Version Size :-13
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName:-F10_5KB.txt
File Sent
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006
2. FileName: F1_10KB.txt IP:127.0.0.1 Port:60001

Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F6_9KB.txt Refresh with Master
```

## Refresh 2:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client10
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Invalidate Called *****
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
*****Invalidate Called *****
*****Invalidate Called *****
Version Size :-13
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName:-F10_5KB.txt
File Sent
*****Refresh function called*****
FileName :F1_10KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006
2. FileName: F1_10KB.txt IP:127.0.0.1 Port:60001

Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F6_9KB.txt Refresh with Master
0
sending request to peer
sending request to peer
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- *****Refresh function called*****
2
List of invalid Files
1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  FileName :F1_10KB.txt Refresh with Master
```

## Download 3:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
Version Size :-15
*****Refresh function called*****
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
***** Invalidate Called *****
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName :F1_10KB.txt
File Sent
*****Refresh function called*****
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

## Refresh 3:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
Version Size :-15
*****Refresh function called*****
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
***** Invalidate Called *****
*****Refresh function called*****
FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
FileName :F1_10KB.txt
File Sent
*****Refresh function called*****
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-  FileName :F3_10KB.txt Refresh with Master
FileName :F2_1KB.txt Refresh with Master
FileName :F4_100kb.txt Refresh with Master
FileName :F6_9KB.txt Refresh with Master
0
sending request to peer

1. Lookup Files
2. Refresh Files
3. Exit
Enter :-
```

## TTR value : 5 mins.

Test Case 10 : Client 1 and 2 downloads (and refreshes) randomly(before this test we set everything to original configuration.

### Downloads 1:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
10. 127.0.0.16001
127.0.0.1 60001
Client listening on 60001

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F6_9KB.txt
*****      Lookup for file      *****
File Not Found

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F6_9KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 182
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 182msAuthor:Master Version:-1.0

F Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 7
A Downloaded file :F6_9KB.txt File size : 9.07KB
Performance speed 1.22MB/sec
-----
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 7
Downloaded file :F6_9KB.txt File size : 9.07KB
Performance speed 1.22MB/sec
-----

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F8_6KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 190
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60008 Response Time :- 190msAuthor:Master Version:-1.0

S Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F8_6KB.txt File size : 6.05KB
Performance speed 1.36MB/sec
-----

A
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

## Invalidate1 :

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 190
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60008 Response Time :- 190ms Author:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileversion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F8_6KB.txt File size : 6.05KB
Performance speed 1.36MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F5_5KB.txt
Query Type:- Request
FileName:-F6_6KB.txt
-> FileName :F6_9KB.txt Refresh with Master
FileName :F8_6KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F6_9KB.txt Refresh with Master
FileName :F8_6KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

## Download 2:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
7. 127.0.0.160008
8. 127.0.0.160009
9. 127.0.0.160010
10. 127.0.0.160011
127.0.0.1 60002
Client listening on 60002

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F6_9KB.txt
Query Type:- Request
FileName:-F6_9KB.txt
Query Type:- Request
FileName:-F8_6KB.txt
1

Enter File name :- F5_5KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 225
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60005 Response Time :- 225msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 9
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.51MB/sec
-----
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 9
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.51MB/sec
-----

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F6_6KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 150
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 150msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_6KB.txt File size : 6.05KB
Performance speed 1.26MB/sec
-----

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

## Invalidate 2:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client2
      3. Exit
      Enter :- 1

      Enter File name :- F6_6KB.txt
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 150
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:60006 Response Time :- 150msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_6KB.txt File size : 6.05KB
Performance speed 1.26MB/sec
-----
S
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- ***** Invalidate Called *****
FileName :F5_5KB.txt Refresh with Master
***** Invalidate Called *****
FileName :F6_6KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
2
List of invalid Files
1. FileName: F5_5KB.txt IP:127.0.0.1 Port:60005
2. FileName: F6_6KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :- 0
```

2. Testing the effectiveness of PULL. Let 2 to 3 peers do queries, downloads, and refreshes. The remaining peers simulate modifications using an exponential distribution. Collect statistics of the percentage of invalid query results.

### PULL 1:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/BusToPeer/Client1
Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F8_6KB.txt File size : 6.05KB
Performance speed 1.36MB/sec
-----
S
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F5_5KB.txt
Query Type:- Request
FileName:-F6_6KB.txt
FileName :F6_9KB.txt Refresh with Master
FileName :F8_6KB.txt Refresh with Master
***** Invalidate Called *****
2
List of invalid Files
1. FileName: F6_9KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :- 0
sending request to peer
-----
S
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 0
```

## PULL2:

```
lastwalker@minalsfile:~/editur/Views/Search/Downloads/BusToPeer/Client2
*****
----- Download file -----
1. Clienti IP:127.0.0.1 Port:60006 Response Time :- 150ms Author:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 4
Downloaded file :F6_6KB.txt File size : 6.05KB
Performance speed 1.26MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- ***** Invalidate Called *****
FileName :F5_5KB.txt Refresh with Master
***** Invalidate Called *****
FileName :F6_6KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
2
List of invalid Files
1. FileName: F5_5KB.txt IP:127.0.0.1 Port:60005
2. FileName: F6_6KB.txt IP:127.0.0.1 Port:60006

Select File to Download (Please Enter No.) OR Press '0' to Update All :- 0
sending request to peer
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :-
```

## STAR TOPOLOGY.

### TTR value : 5 mins.

Test Case 1 : Randomly downloading files and refreshing.

Download1:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client1
127.0.0.1 40010 available
Version Size :-11
1. 127.0.0.140002
2. 127.0.0.140003
3. 127.0.0.140004
4. 127.0.0.140005
5. 127.0.0.140006
6. 127.0.0.140007
7. 127.0.0.140008
8. 127.0.0.140009
9. 127.0.0.140010
127.0.0.1 40001
Client listening on 40001

1. Lookup Files
2. Refresh Files
3. Exit
Enter -- 1

Enter File name :- F10_1KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 324
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:40010 Response Time :- 324msAuthor:Master Version:-1.0

F Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
Transfer Time in milliseconds: 5
Downloaded file :F10_1KB.txt File size : 1.01KB
Performance speed 0.19MB/sec
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client1
mv2 tmp.txt fileVersion.txt
sending request to peer
Transfer Time in milliseconds: 5
Downloaded file :F10_1KB.txt File size : 1.01KB
Performance speed 0.19MB/sec

1. Lookup Files
2. Refresh Files
3. Exit
Enter -- 1

Enter File name :- F5_5KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 173
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:40005 Response Time :- 173msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
Transfer Time in milliseconds: 7
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.64MB/sec

1. Lookup Files
2. Refresh Files
3. Exit
Enter -- 1
```

## Invalid 1 :

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client
      2. Refresh Files
      3. Exit
Enter :- 1

Enter File name :- F5_5KB.txt
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 173
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:40005 Response Time :- 173msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 7
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.64MB/sec
-----
S
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- Query Type:- Request
fileName:-F2_2KB.txt
Query Type:- Request
fileName:-F3_3KB.txt
  fileName :F10_1KB.txt Refresh with Master
  fileName :F5_5KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
  fileName :F10_1KB.txt Refresh with Master
  fileName :F5_5KB.txt Refresh with Master
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client
***** Lookup for file *****
-----
Average Response Time from '1' Clients in Milliseconds: 173
-----
***** Download file *****
1. Client1 IP:127.0.0.1 Port:40005 Response Time :- 173msAuthor:Master Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 7
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.64MB/sec
-----
M
      1. Lookup Files
      2. Refresh Files
      3. Exit
Enter :- Query Type:- Request
fileName:-F2_2KB.txt
Query Type:- Request
fileName:-F3_3KB.txt
  fileName :F10_1KB.txt Refresh with Master
  fileName :F5_5KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
  fileName :F10_1KB.txt Refresh with Master
  fileName :F5_5KB.txt Refresh with Master
2
List of invalid Files
1. fileName: F10_1KB.txt IP:127.0.0.1 Port:40010
2. fileName: F5_5KB.txt IP:127.0.0.1 Port:40005

Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

## Download 2 :

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client9
5. 127.0.0.140005
6. 127.0.0.140006
7. 127.0.0.140007
8. 127.0.0.140008
9. 127.0.0.140010
127.0.0.1 40009

Client listening on 40009

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F10_1KB.txt
Query Type:- Request
FileName:-F5_5KB.txt
1

Enter File name :- F2_2KB.txt
*****      Lookup for file      *****
Average Response Time from '1' Clients in Milliseconds: 193
-----
*****      Download file      *****
1. Client1  IP:127.0.0.1  Port:40002  Response Time :- 193msAuthor:Master  Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 8
Downloaded file :F2_2KB.txt File size : 2.02KB
Performance speed 0.23MB/sec
-----
1. Lookup Files
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client9
Average Response Time from '1' Clients in Milliseconds: 193
-----
*****      Download file      *****
1. Client1  IP:127.0.0.1  Port:40002  Response Time :- 193msAuthor:Master  Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 8
Downloaded file :F2_2KB.txt File size : 2.02KB
Performance speed 0.23MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F3_3KB.txt
*****      Lookup for file      *****
1
Average Response Time from '1' Clients in Milliseconds: 65
-----
*****      Download file      *****
1. Client1  IP:127.0.0.1  Port:40003  Response Time :- 65msAuthor:Master  Version:-1.0

Select Client to Download (Please Enter No.) :- 1
Index: 10, Size: 1

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1
```

## Invalid 2 :

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client
Select Client to Download (Please Enter No.) :- 1
Version :- 1.0
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 8
Downloaded file :F2_2KB.txt File size : 2.02KB
Performance speed 0.23MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F3_3KB.txt
*****      Lookup for file      *****
1-----
Average Response Time from '1' Clients in Milliseconds: 65
-----
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:40003 Response Time :- 65msAuthor:Master Version:-1.0
>-
Select Client to Download (Please Enter No.) :- 1
Index: 10, Size: 1

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_2KB.txt Refresh with Master
*****      Invalidate Called      *****
*****      Invalidate Called      *****
*****      Invalidate Called      *****
*****      Invalidate Called      *****

lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client
sending request to peer
-----
Transfer Time in milliseconds: 8
Downloaded file :F2_2KB.txt File size : 2.02KB
Performance speed 0.23MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F3_3KB.txt
*****      Lookup for file      *****
1-----
Average Response Time from '1' Clients in Milliseconds: 65
-----
*****      Download file      *****
1. Client1 IP:127.0.0.1 Port:40003 Response Time :- 65msAuthor:Master Version:-1.0
>-
Select Client to Download (Please Enter No.) :- 1
Index: 10, Size: 1

1. Lookup Files
2. Refresh Files
3. Exit
Enter :- File Name :F2_2KB.txt Refresh with Master
*****      Invalidate Called      *****
*****      Invalidate Called      *****
*****      Invalidate Called      *****
*****      Invalidate Called      *****
```

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client
-----  
Select Client to Download (Please Enter No.) :- 1  
Version :- 1.0  
mv2 tmp.txt fileVersion.txt  
-----  
sending request to peer  
-----  
Transfer Time in milliseconds: 8  
Downloaded file :F2_2KB.txt File size : 2.02KB  
Performance speed 0.23MB/sec  
-----  
1. Lookup Files  
2. Refresh Files  
3. Exit  
Enter :- 1  
  
Enter File name :- F3_3KB.txt  
*****      Lookup for file      *****  
1-----  
Average Response Time from '1' Clients in Milliseconds: 65  
-----  
*****      Download file      *****  
1. Client1 IP:127.0.0.1 Port:40003 Response Time :- 65msAuthor:Master Version:-1.0  
-----  
>-  
Select Client to Download (Please Enter No.) :- 1  
Index: 10, Size: 1  
  
1. Lookup Files  
2. Refresh Files  
3. Exit  
Enter :- File Name :F2_2KB.txt Refresh with Master  
*****      Invalidate Called      *****  
*****      Invalidate Called      *****  
*****      Invalidate Called      *****  
*****      Invalidate Called      *****  
2  
List of invalid Files  
1. File Name: F2_2KB.txt IP:127.0.0.1 Port:40002  
  
Select File to Download (Please Enter No.) OR Press '0' to Update All :-
```

## Test case 2 :

Testing the effectiveness of PULL. Let 2 to 3 peers do queries, downloads, and refreshes. The remaining peers simulate modifications using an exponential distribution. Collect statistics of the percentage of invalid query results.

### PULL1:

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client1
mv2 tmp.txt fileVersion.txt
sending request to peer
-----
Transfer Time in milliseconds: 7
Downloaded file :F5_5KB.txt File size : 5.04KB
Performance speed 0.64MB/sec
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- Query Type:- Request
FileName:-F2_2KB.txt
Query Type:- Request
FileName:-F3_3KB.txt
FileName :F10_1KB.txt Refresh with Master
FileName :F5_5KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
FileName :F10_1KB.txt Refresh with Master
FileName :F5_5KB.txt Refresh with Master
2
List of invalid Files
1. FileName: F10_1KB.txt IP:127.0.0.1 Port:40010
2. FileName: F5_5KB.txt IP:127.0.0.1 Port:40005

Fz Select File to Download (Please Enter No.) OR Press '0' to Update All :- 0
sending request to peer
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  File Name :F10_1KB.txt Refresh with Master
FileName :F5_5KB.txt Refresh with Master
```

### PULL2 :

```
lastwalker@Chelsea: ~/Documents/Sem-2/CS550/PA3/Final/StarToPeer/Client9
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 1

Enter File name :- F3_3KB.txt
***** Lookup for file *****
1
Average Response Time from '1' Clients in Milliseconds: 65
-----
1. Client1 IP:127.0.0.1 Port:40003 Response Time :- 65ms Author:Master Version:-1.0

M Select Client to Download (Please Enter No.) :- 1
Index: 10, Size: 1

1. Lookup Files
2. Refresh Files
3. Exit
Enter :-  File Name :F2_2KB.txt Refresh with Master
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
***** Invalidate Called *****
2
Fz List of invalid Files
1. FileName: F2_2KB.txt IP:127.0.0.1 Port:40002

Fz Select File to Download (Please Enter No.) OR Press '0' to Update All :- 0
sending request to peer
-----
1. Lookup Files
2. Refresh Files
3. Exit
Enter :- 0
```