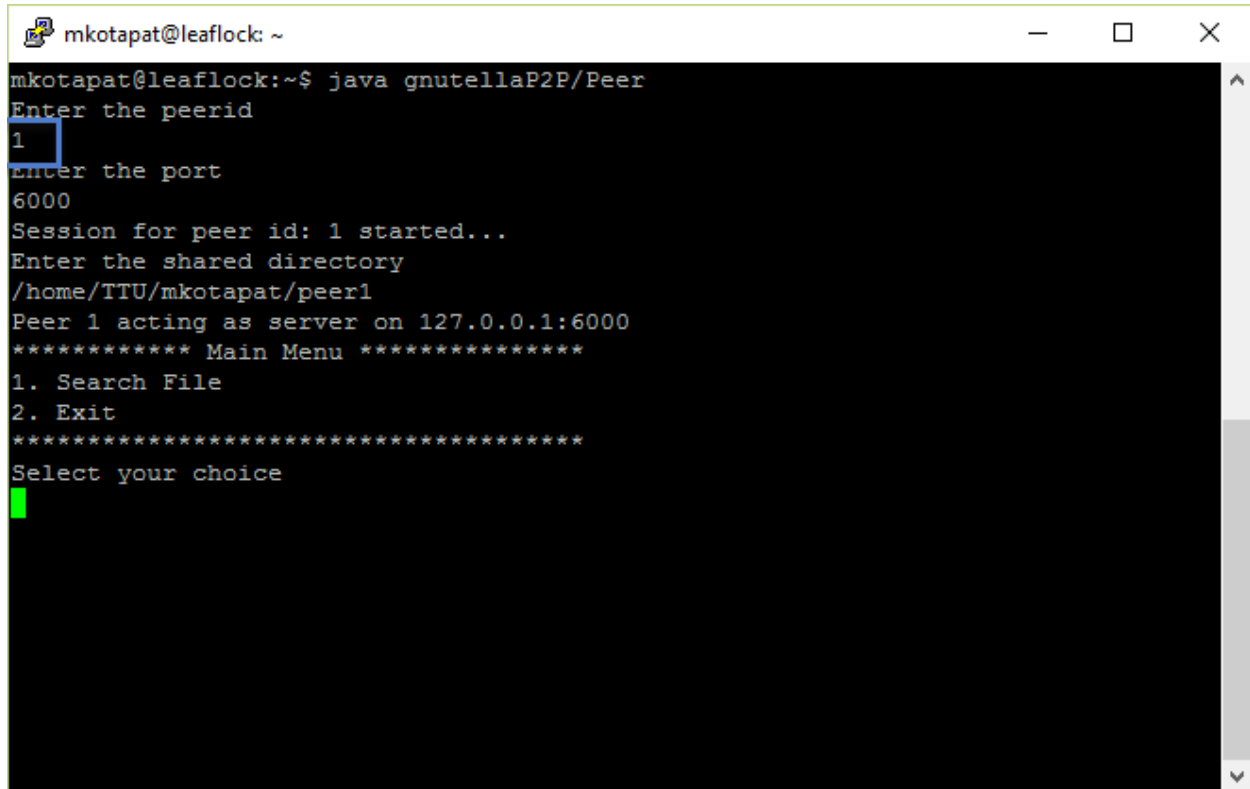


Test cases and Performance Evaluation

Note: All these test cases are executed in leafloack.cs.ttu.edu and source files in /home/TTU/mkotapat

1. Test Case 1: Peer listening – java gnutellaP2P/Peer



```
mkotapat@leaflock: ~  
mkotapat@leaflock:~$ java gnutellaP2P/Peer  
Enter the peerid  
1  
Enter the port  
6000  
Session for peer id: 1 started...  
Enter the shared directory  
/home/TTU/mkotapat/peer1  
Peer 1 acting as server on 127.0.0.1:6000  
***** Main Menu *****  
1. Search File  
2. Exit  
*****  
Select your choice  
█
```

Peer running successfully

2. Test Case 2: Mesh - Perform search in Mesh

Set config properties as follows

```
config properties x
5 peerid.7.port=5007
6 peerid.8.ip=127.0.0.1
7 peerid.8.port=5008
8 peerid.9.ip=127.0.0.1
9 peerid.9.port=5009
0
1
2 # Neighbor details
3 #3X3 Mesh
4 peerid.1.neighbors=peerid.2,peerid.4
5 peerid.2.neighbors=peerid.1,peerid.3,peerid.5
6 peerid.3.neighbors=peerid.2,peerid.6
7 peerid.4.neighbors=peerid.1,peerid.5,peerid.7
8 peerid.5.neighbors=peerid.2,peerid.4,peerid.6,peerid.8
9 peerid.6.neighbors=peerid.3,peerid.5,peerid.9
0 peerid.7.neighbors=peerid.4,peerid.8
1 peerid.8.neighbors=peerid.5,peerid.7,peerid.9
2 peerid.9.neighbors=peerid.6,peerid.8
3
```

Run 9 peers as shown in test case 1

Perform search in peer 1

```
mkotapat@leaflock: ~  
mkotapat@leaflock:~$ java gnutellaP2P/Peer  
Enter the peerid  
1  
Enter the port  
6000  
Session for peer id: 1 started...  
Enter the shared directory  
/home/TTU/mkotapat/peer1  
Peer 1 acting as server on 127.0.0.1:6000  
***** Main Menu *****  
1. Search File  
2. Exit  
*****  
Select your choice  
1  
Enter file name to search:  
CommonFile1.txt  
Message id for search: Peer1.Search1  
Sending request to peerid.2 7002  
Sending request to peerid.4 7004  
*** Search Paths ***  
Search Path: 12369  
Search Path: 145  
Search Path: 1478  
*****  
CommonFile1.txt File found in the network at below peers  
--Found at Peer3 , running on 127.0.0.1:7003  
--Found at Peer9 , running on 127.0.0.1:7009  
--Found at Peer5 , running on 127.0.0.1:7005  
--Found at Peer7 , running on 127.0.0.1:7007  
***Download Menu***  
1.Download file  
2.Exit  
*****  
Select operaion  
█
```

Observe the search paths which are done in Mesh network

Search Path: 12369

Search Path: 145

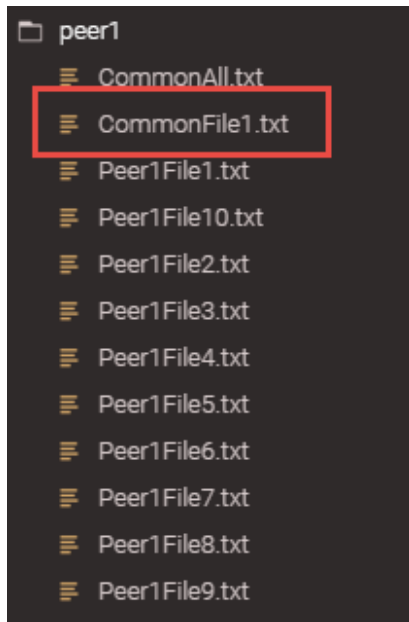
Search Path: 1478

File found in 4 peers as shown above. Search performed successfully.

3. Test Case 3: Mesh - Download from search results

```
mkotapat@leaflock: ~  
Enter the port  
6000  
Session for peer id: 1 started...  
Enter the shared directory  
/home/TTU/mkotapat/peer1  
Peer 1 acting as server on 127.0.0.1:6000  
***** Main Menu *****  
1. Search File  
2. Exit  
*****  
Select your choice  
1  
Enter file name to search:  
CommonFile1.txt  
Message id for search: Peer1.Search1  
Sending request to peerid.2 7002  
Sending request to peerid.4 7004  
*** Search Paths ***  
Search Path: 12369  
Search Path: 145  
Search Path: 1478  
*****  
CommonFile1.txt File found in the network at below peers  
--Found at Peer3 , running on 127.0.0.1:7003  
--Found at Peer9 , running on 127.0.0.1:7009  
--Found at Peer5 , running on 127.0.0.1:7005  
--Found at Peer7 , running on 127.0.0.1:7007  
***Download Menu***  
1.Download file  
2.Exit  
*****  
Select operation  
1  
Enter peer id to connect and download the file  
5  
Downloading from localhost:7005  
"CommonFile1.txt" downloaded to path: /home/TTU/mkotapat/peer1  
***** Main Menu *****
```

File download from peer 5 to peer 1 to /home/TTU/mkotapat/peer1



4. Test Case 4: Star Network – Perform Search

Set Config file as

```
34 #6 star network
35 peerid.1.neighbors=peerid.2,peerid.3,peerid.4,peerid.5,peerid.6,peerid.7,peerid.8,peerid.9
36 peerid.2.neighbors=peerid.1
37 peerid.3.neighbors=peerid.1
38 peerid.4.neighbors=peerid.1
39 peerid.5.neighbors=peerid.1
40 peerid.6.neighbors=peerid.1
41 peerid.7.neighbors=peerid.1
42 peerid.8.neighbors=peerid.1
43 peerid.9.neighbors=peerid.1
44
45
```

Run 9 peers as shown in test case 1

Perform search in peer1

```
***** Main Menu *****
1. Search File
2. Exit
*****
Select your choice
1
Enter file name to search:
CommonFile1.txt
Message id for search: Peer1.Search2
Sending request to peerid.2 7002
Sending request to peerid.3 7003
Sending request to peerid.4 7004
Sending request to peerid.5 7005
Sending request to peerid.6 7006
Sending request to peerid.7 7007
Sending request to peerid.8 7008
Sending request to peerid.9 7009
*** Search Paths ***
Search Path: 12
Search Path: 13
Search Path: 14
Search Path: 15
Search Path: 16
Search Path: 17
Search Path: 18
Search Path: 19
*****
CommonFile1.txt File found in the network at below peers
--Found at Peer3 , running on 127.0.0.1:7003
--Found at Peer5 , running on 127.0.0.1:7005
--Found at Peer7 , running on 127.0.0.1:7007
--Found at Peer9 , running on 127.0.0.1:7009
***Download Menu***
1.Download file
2.Exit
*****
Select operaion
```

Observe the search paths which are done in star network

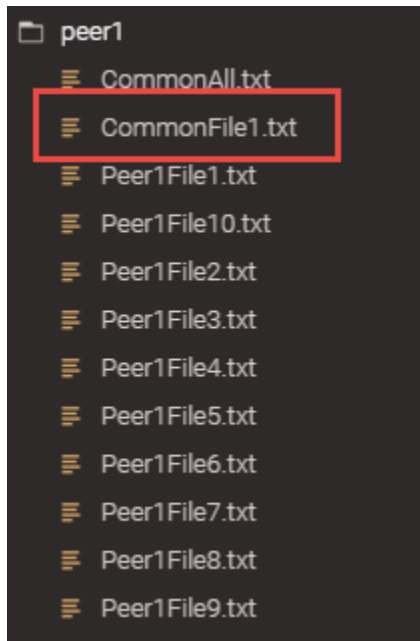
Search Path: 12
Search Path: 13
Search Path: 14
Search Path: 15
Search Path: 16
Search Path: 17
Search Path: 18
Search Path: 19

File existed in 4 peers as shown above. Search performed successfully.

5. Test Case 5: Star Network – File download from search results

```
***** Main Menu *****
1. Search File
2. Exit
*****
Select your choice
1
Enter file name to search:
CommonFile1.txt
Message id for search: Peer1.Search2
Sending request to peerid.2 7002
Sending request to peerid.3 7003
Sending request to peerid.4 7004
Sending request to peerid.5 7005
Sending request to peerid.6 7006
Sending request to peerid.7 7007
Sending request to peerid.8 7008
Sending request to peerid.9 7009
*** Search Paths ***
Search Path: 12
Search Path: 13
Search Path: 14
Search Path: 15
Search Path: 16
Search Path: 17
Search Path: 18
Search Path: 19
*****
CommonFile1.txt File found in the network at below peers
--Found at Peer3 , running on 127.0.0.1:7003
--Found at Peer5 , running on 127.0.0.1:7005
--Found at Peer7 , running on 127.0.0.1:7007
--Found at Peer9 , running on 127.0.0.1:7009
***Download Menu***
1.Download file
2.Exit
*****
Select operation
1
Enter peer id to connect and download the file
7
Downloading from localhost:7007
"CommonFile1.txt" downloaded to path: /home/TTU/mkotapat/peer1
```

File downloaded from peer 7 to peer 1 /home/TTU/mkotapat/peer1 directory



6. Performance Evaluation:

Assume mesh network of 3X3 peers. Find the response time of Peer1 for 1000 requests in following scenarios

- When it is the only peer performing the search in the network.
- When there is one more peer performing the search in the network
- When there are two more peers performing the search in the network

i) Average response time for 1000 requests for peer1 - only one peer performing search in network

Modified PerformanceLauncher.java to allow only peer to search

Run the performance evaluator as java **PerformanceLauncher**


```
Local Search: File Found in the current peer
Incoming Request to peer 7: From - 8 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
Incoming Request to peer 3: From - 6 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
Incoming Request to peer 9: From - 6 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
Outgoing Request from peer 9: Sending request to peerid.6 8006
HitQuery: Send following result back to 5
Incoming Request to peer 6: From - 9 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
HitQuery: Send following result back to 8
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 5
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 4
--Found at Peer5 on localhost:8005
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 1
--Found at Peer5 on localhost:8005
--Found at Peer9 on localhost:8009
--Found at Peer7 on localhost:8007
    *** Search Paths ***
Search Path: 123
Search Path: 1456
Search Path: 14589
Search Path: 147
*****
CommonFile1.txt File found in the network at below peers
--Found at Peer2 , running on localhost:8002
--Found at Peer3 , running on localhost:8003
--Found at Peer5 , running on localhost:8005
--Found at Peer9 , running on localhost:8009
--Found at Peer7 , running on localhost:8007
Downloading from localhost:8005
"CommonFile1.txt" downloaded to path: //home//TTU//mkotapat//peer1
peerid 1 search running time is 27098
```

Total time is 27098 for 1000 requests.

Average time for each request is 27.09 Milli seconds.

ii) Average response time for 1000 requests for peer1 - two peers performing search in network

Modified PerformanceLauncher.java to allow two peers to search

Run the performance evaluator as java **PerformanceLauncher**

```
HitQuery: Send following result back to 1
--Found at Peer7 on localhost:8007
Incoming Request to peer 7: From - 8 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
Incoming Request to peer 9: From - 8 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
HitQuery: Send following result back to 5
Incoming Request to peer 8: From - 9 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
HitQuery: Send following result back to 6
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 5
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 2
--Found at Peer5 on localhost:8005
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 1
--Found at Peer3 on localhost:8003
--Found at Peer5 on localhost:8005
--Found at Peer9 on localhost:8009
*** Search Paths ***
Search Path: 123
Search Path: 12569
Search Path: 1258
Search Path: 147
*****
CommonFile1.txt File found in the network at below peers
--Found at Peer3 , running on localhost:8003
--Found at Peer5 , running on localhost:8005
--Found at Peer9 , running on localhost:8009
--Found at Peer7 , running on localhost:8007
Downloading from localhost:8005
"CommonFile1.txt" downloaded to path: //home//TTU//mkotapat//peer1
peerid 1 search running time is 30306
```

Total time is 30306 for 1000 requests.

Average time for each request is 30.3 Milli seconds

iii) Average response time for 1000 requests for peer1 - three peers performing search in network

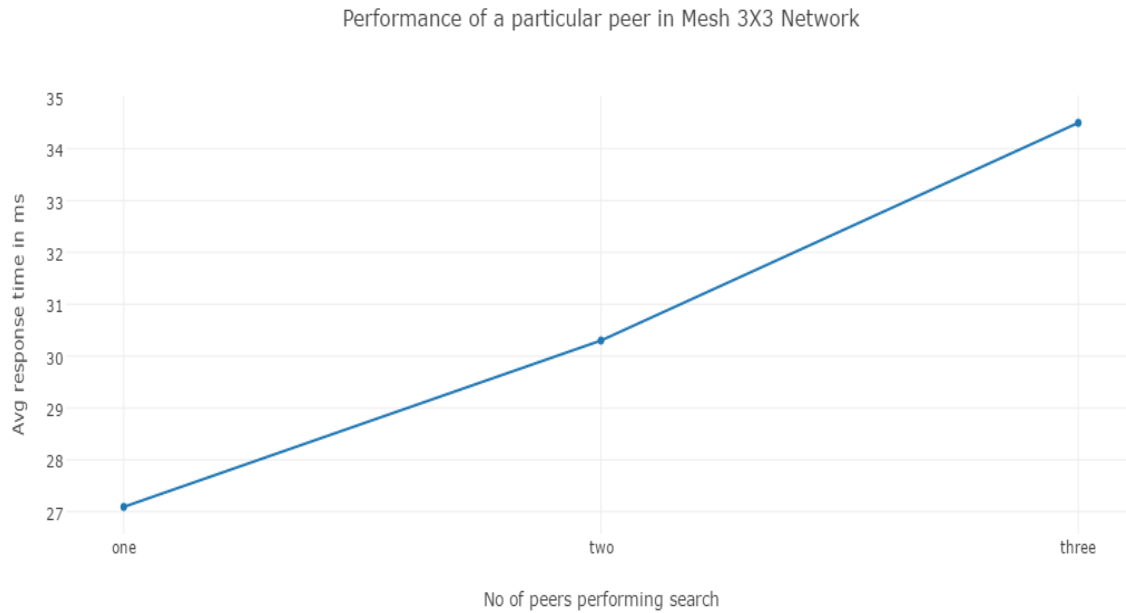
Modified PerformanceLauncher.java to allow three peers to search

Run the performance evaluator as java **PerformanceLauncher**

```
Incoming Request to peer 8: From - 9 Duplicate Request - Already searched in this peer- with message id - Peer1.Search1000
HitQuery: Send following result back to 6
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 3
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 2
--Found at Peer3 on localhost:8003
--Found at Peer9 on localhost:8009
HitQuery: Send following result back to 1
--Found at Peer2 on localhost:8002
--Found at Peer3 on localhost:8003
--Found at Peer9 on localhost:8009
--Found at Peer5 on localhost:8005
*** Search Paths ***
Search Path: 12369
Search Path: 1258
Search Path: 147
*****
CommonFile1.txt File found in the network at below peers
--Found at Peer2 , running on localhost:8002
--Found at Peer3 , running on localhost:8003
--Found at Peer9 , running on localhost:8009
--Found at Peer5 , running on localhost:8005
--Found at Peer7 , running on localhost:8007
Downloading from localhost:8005
"CommonFile1.txt" downloaded to path: //home//TTU//mkotapat//peer1
peerid 1 search running time is 34555
```

Total time is 34555 for 1000 requests.

Average time for each request is 34.5 Milli seconds



Plot analysis for the above results.

Observations from the P2P with index server and Gnutella style P2P:

In index server managed P2P file system, index server maintains files of all the peers and there will be less overhead on all the peers.

In Gnutella style P2P system, the search will be performed by traversing through all the peers in the network and checking files of every peer.

Thus Gnutella takes average response time more than the index server managed P2P system. But this is only the case when there are less peers.

For large peer network the Gnutella maintains the same average response time as of less peers network.