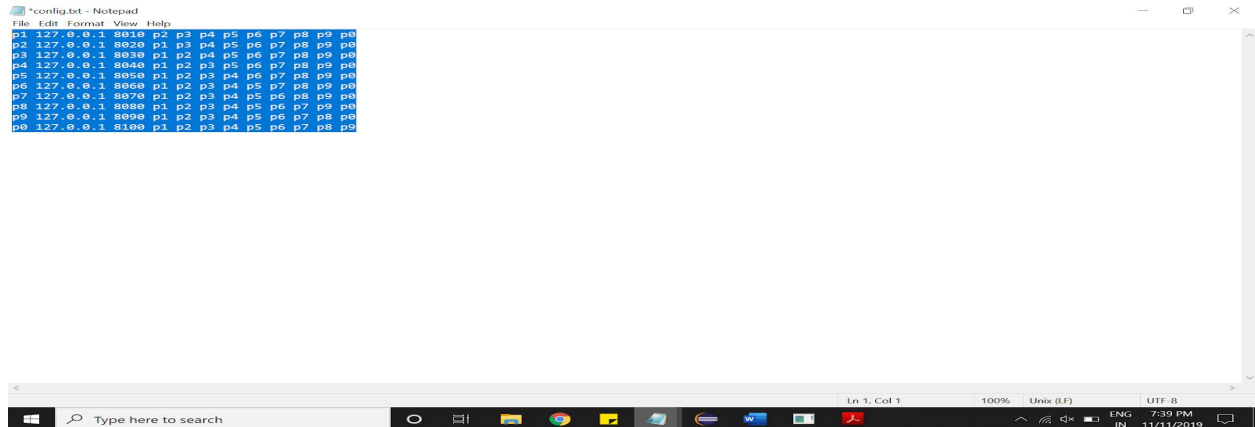


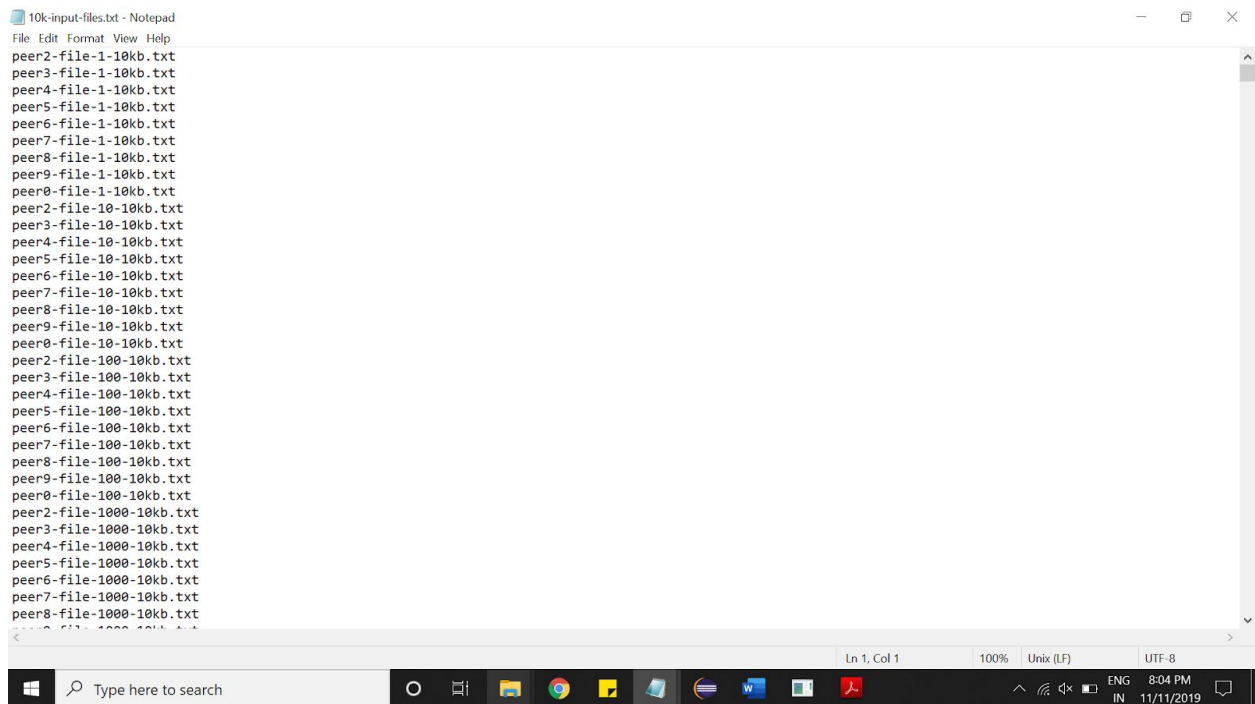
1. A centralized system (from PA1), 9 peers connected, and 1 centralized index; 9 clients to issue requests (all 10 VMs would be used)

Configuration File for above topology



```
p1 127.0.0.1 8010 p2 p3 p4 p5 p6 p7 p8 p9 p0
p2 127.0.0.1 8020 p1 p3 p4 p5 p6 p7 p8 p9 p0
p3 127.0.0.1 8030 p1 p2 p4 p5 p6 p7 p8 p9 p0
p4 127.0.0.1 8040 p1 p2 p3 p5 p6 p7 p8 p9 p0
p5 127.0.0.1 8050 p1 p2 p3 p4 p6 p7 p8 p9 p0
p6 127.0.0.1 8060 p1 p2 p3 p4 p5 p7 p8 p9 p0
p7 127.0.0.1 8070 p1 p2 p3 p4 p5 p6 p8 p9 p0
p8 127.0.0.1 8080 p1 p2 p3 p4 p5 p6 p7 p9 p0
p9 127.0.0.1 8090 p1 p2 p3 p4 p5 p6 p7 p8 p9
p0 127.0.0.1 8100 p1 p2 p3 p4 p5 p6 p7 p8 p9
```

- a. Query latency: 1 client issues 10K query requests for random files from Small dataset



```
peer2-file-1-10kb.txt
peer3-file-1-10kb.txt
peer4-file-1-10kb.txt
peer5-file-1-10kb.txt
peer6-file-1-10kb.txt
peer7-file-1-10kb.txt
peer8-file-1-10kb.txt
peer9-file-1-10kb.txt
peer0-file-1-10kb.txt
peer2-file-10-10kb.txt
peer3-file-10-10kb.txt
peer4-file-10-10kb.txt
peer5-file-10-10kb.txt
peer6-file-10-10kb.txt
peer7-file-10-10kb.txt
peer8-file-10-10kb.txt
peer9-file-10-10kb.txt
peer0-file-10-10kb.txt
peer2-file-100-10kb.txt
peer3-file-100-10kb.txt
peer4-file-100-10kb.txt
peer5-file-100-10kb.txt
peer6-file-100-10kb.txt
peer7-file-100-10kb.txt
peer8-file-100-10kb.txt
peer9-file-100-10kb.txt
peer0-file-100-10kb.txt
peer2-file-1000-10kb.txt
peer3-file-1000-10kb.txt
peer4-file-1000-10kb.txt
peer5-file-1000-10kb.txt
peer6-file-1000-10kb.txt
peer7-file-1000-10kb.txt
peer8-file-1000-10kb.txt
peer9-file-1000-10kb.txt
peer0-file-1000-10kb.txt
```

Ten VMs have started with providing Peer name as p1, p2, p3, ..., p9, p0 and registering all files present in the folder

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-1
File peer1-file-83-10kb.txt is registered in the local peer !
File peer1-file-84-10kb.txt is registered in the local peer !
File peer1-file-85-10kb.txt is registered in the local peer !
File peer1-file-86-10kb.txt is registered in the local peer !
File peer1-file-87-10kb.txt is registered in the local peer !
File peer1-file-88-10kb.txt is registered in the local peer !
File peer1-file-89-10kb.txt is registered in the local peer !
File peer1-file-9-10kb.txt is registered in the local peer !
File peer1-file-90-10kb.txt is registered in the local peer !
File peer1-file-91-10kb.txt is registered in the local peer !
File peer1-file-92-10kb.txt is registered in the local peer !
File peer1-file-93-10kb.txt is registered in the local peer !
File peer1-file-94-10kb.txt is registered in the local peer !
File peer1-file-95-10kb.txt is registered in the local peer !
File peer1-file-96-10kb.txt is registered in the local peer !
File peer1-file-97-10kb.txt is registered in the local peer !
File peer1-file-98-10kb.txt is registered in the local peer !
File peer1-file-99-10kb.txt is registered in the local peer !

1.Set up peer
2.Search and download file in required peer
3.Exit
```

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-2
File peer-2-file-79-10kb.txt is registered in the local peer !
File peer-2-file-8-10kb.txt is registered in the local peer !
File peer-2-file-80-10kb.txt is registered in the local peer !
File peer-2-file-81-10kb.txt is registered in the local peer !
File peer-2-file-82-10kb.txt is registered in the local peer !
File peer-2-file-83-10kb.txt is registered in the local peer !
File peer-2-file-84-10kb.txt is registered in the local peer !
File peer-2-file-85-10kb.txt is registered in the local peer !
File peer-2-file-86-10kb.txt is registered in the local peer !
File peer-2-file-87-10kb.txt is registered in the local peer !
File peer-2-file-88-10kb.txt is registered in the local peer !
File peer-2-file-89-10kb.txt is registered in the local peer !
File peer-2-file-9-10kb.txt is registered in the local peer !
File peer-2-file-90-10kb.txt is registered in the local peer !
File peer-2-file-91-10kb.txt is registered in the local peer !
File peer-2-file-92-10kb.txt is registered in the local peer !
File peer-2-file-93-10kb.txt is registered in the local peer !
File peer-2-file-94-10kb.txt is registered in the local peer !
File peer-2-file-95-10kb.txt is registered in the local peer !
File peer-2-file-96-10kb.txt is registered in the local peer !
File peer-2-file-97-10kb.txt is registered in the local peer !
File peer-2-file-98-10kb.txt is registered in the local peer !
File peer-2-file-99-10kb.txt is registered in the local peer !

1.Set up peer
2.Search and download file in required peer
3.Exit
```

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-3
File peer-3-file-78-10kb.txt is registered in the local peer |
File peer-3-file-79-10kb.txt is registered in the local peer |
File peer-3-file-8-10kb.txt is registered in the local peer |
File peer-3-file-80-10kb.txt is registered in the local peer |
File peer-3-file-81-10kb.txt is registered in the local peer |
File peer-3-file-82-10kb.txt is registered in the local peer |
File peer-3-file-83-10kb.txt is registered in the local peer |
File peer-3-file-84-10kb.txt is registered in the local peer |
File peer-3-file-85-10kb.txt is registered in the local peer |
File peer-3-file-86-10kb.txt is registered in the local peer |
File peer-3-file-87-10kb.txt is registered in the local peer |
File peer-3-file-88-10kb.txt is registered in the local peer |
File peer-3-file-89-10kb.txt is registered in the local peer |
File peer-3-file-9-10kb.txt is registered in the local peer |
File peer-3-file-90-10kb.txt is registered in the local peer |
File peer-3-file-91-10kb.txt is registered in the local peer |
File peer-3-file-92-10kb.txt is registered in the local peer |
File peer-3-file-93-10kb.txt is registered in the local peer |
File peer-3-file-94-10kb.txt is registered in the local peer |
File peer-3-file-95-10kb.txt is registered in the local peer |
File peer-3-file-96-10kb.txt is registered in the local peer |
File peer-3-file-97-10kb.txt is registered in the local peer |
File peer-3-file-98-10kb.txt is registered in the local peer |
File peer-3-file-99-10kb.txt is registered in the local peer |

1.Set up peer
2.Search and download file in required peer
3.Exit
```

A screenshot of a Windows terminal window. The title bar at the top reads "vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-4". The terminal content shows a list of 20 files, each followed by the text "is registered in the local peer |". The files are named "peer-4-file-78-10kb.txt" through "peer-4-file-99-10kb.txt". Below this list, there is a menu with three numbered options: "1.Set up peer", "2.Search and download file in required peer", and "3.Exit". The Windows taskbar is visible at the bottom, showing the Start button, a search bar with the text "Type here to search", and several application icons including File Explorer, Google Chrome, and Microsoft Word. The system tray on the right shows the date and time as "11/11/2019" and "7:22 PM".

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-5
File peer-5-file-75-10kb.txt is registered in the local peer |
File peer-5-file-76-10kb.txt is registered in the local peer |
File peer-5-file-77-10kb.txt is registered in the local peer |
File peer-5-file-78-10kb.txt is registered in the local peer |
File peer-5-file-79-10kb.txt is registered in the local peer |
File peer-5-file-8-10kb.txt is registered in the local peer |
File peer-5-file-80-10kb.txt is registered in the local peer |
File peer-5-file-81-10kb.txt is registered in the local peer |
File peer-5-file-82-10kb.txt is registered in the local peer |
File peer-5-file-83-10kb.txt is registered in the local peer |
File peer-5-file-84-10kb.txt is registered in the local peer |
File peer-5-file-85-10kb.txt is registered in the local peer |
File peer-5-file-86-10kb.txt is registered in the local peer |
File peer-5-file-87-10kb.txt is registered in the local peer |
File peer-5-file-88-10kb.txt is registered in the local peer |
File peer-5-file-89-10kb.txt is registered in the local peer |
File peer-5-file-9-10kb.txt is registered in the local peer |
File peer-5-file-90-10kb.txt is registered in the local peer |
File peer-5-file-91-10kb.txt is registered in the local peer |
File peer-5-file-92-10kb.txt is registered in the local peer |
File peer-5-file-93-10kb.txt is registered in the local peer |
File peer-5-file-94-10kb.txt is registered in the local peer |
File peer-5-file-95-10kb.txt is registered in the local peer |
File peer-5-file-96-10kb.txt is registered in the local peer |
File peer-5-file-97-10kb.txt is registered in the local peer |
File peer-5-file-98-10kb.txt is registered in the local peer |
File peer-5-file-99-10kb.txt is registered in the local peer |

1.Set up peer
2.Search and download file in required peer
3.Exit
```

A screenshot of a Windows terminal window. The title bar at the top reads "vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-6". The terminal content consists of 19 lines, each stating "File peer-6-file-78-10kb.txt is registered in the local peer" (with the file number increasing from 78 to 99). Below this list, there are three numbered instructions: "1.Set up peer", "2.Search and download file in required peer", and "3.Exit". The terminal window is open over a Windows 10 desktop. The taskbar at the bottom shows the Start button, a search bar with the text "Type here to search", and several pinned application icons including File Explorer, Google Chrome, and Microsoft Word. The system tray on the right shows the date and time as "11/11/2019 7:22 PM" and the language as "ENG IN".

After giving 10k requests

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-1
vaishnavim@Vaishu-Laptop:/mnt/d/PA22/Peer-1$ java Peer /mnt/d/PA22/Peer-1/10k-input-files.txt search /mnt/d/PA22/Peer-1/Files/output-file.txt 1-node
1.Set up peer
2.Search and download file in required peer
3.Exit
1
Enter the peer name in the format of p1, p2, etc :
p1_
```

Files are searched and output log file is downloaded with all the requests

```
peerLog.txt - Notepad
File Edit Format View Help
2019-11-11 20:17:40 Send:query 19964 peer0-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19964 peer9-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19966 peer8-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19967 peer7-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19968 peer6-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19969 peer5-file-10593-10kb.txt p1
2019-11-11 20:17:40 Send:query 19970 peer2-file-10121-10kb.txt p1
2019-11-11 20:17:41 Send:query 19971 peer4-file-10593-10kb.txt p1
2019-11-11 20:17:41 Send:query 19972 peer8-file-10120-10kb.txt p1
2019-11-11 20:17:41 Send:query 19973 peer5-file-10003-10kb.txt p1
2019-11-11 20:17:41 Send:query 19973 peer4-file-10168-10kb.txt p1
2019-11-11 20:17:41 Send:query 19973 peer3-file-10168-10kb.txt p1
2019-11-11 20:17:41 Send:query 19973 peer3-file-10593-10kb.txt p1
2019-11-11 20:17:41 Send:query 19975 peer2-file-10593-10kb.txt p1
2019-11-11 20:17:41 Send:query 19978 peer0-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19978 peer5-file-10168-10kb.txt p1
2019-11-11 20:17:41 Send:query 19980 peer9-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19981 peer6-file-10038-10kb.txt p1
2019-11-11 20:17:41 Send:query 19982 peer7-file-10120-10kb.txt p1
2019-11-11 20:17:41 Send:query 19983 peer3-file-10011-10kb.txt p1
2019-11-11 20:17:41 Send:query 19984 peer8-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19985 peer7-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19986 peer6-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19987 peer5-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19987 peer4-file-10592-10kb.txt p1
2019-11-11 20:17:41 Send:query 19988 peer3-file-10592-10kb.txt p1
2019-11-11 20:17:42 Send:query 19990 peer2-file-10592-10kb.txt p1
2019-11-11 20:17:42 Send:query 19990 peer0-file-10591-10kb.txt p1
2019-11-11 20:17:42 Send:query 19992 peer9-file-10591-10kb.txt p1
2019-11-11 20:17:42 Send:query 19992 peer8-file-10591-10kb.txt p1
2019-11-11 20:17:42 Send:query 19994 peer7-file-10591-10kb.txt p1
2019-11-11 20:17:42 Send:query 19995 peer6-file-10591-10kb.txt p1
2019-11-11 20:17:42 Send:query 19996 peer5-file-10591-10kb.txt p1
```

- b. Query throughput: 9 clients concurrently issue 10K query requests each for random files from Small dataset

Like below requests are issued from all the 9 servers

```
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-0
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-0$ java Peer /mnt/d/PA22/Peer-0/peer-0-input-copy.txt search /mnt/d/PA22/Peer-0/Files/output-file.txt 1-node
```

- c. Transfer throughput Small: 9 clients concurrently issue 10K query + obtain requests each for random files from Small dataset (Request issuing from 4 clients)

```
Select vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-2
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-2$ java Peer /mnt/d/PA22/Peer-2/peer-2-input-copy.txt download /mnt/d/PA22/Peer-2/Files/output-file.txt 1-node

1. Set up peer
2. Search and download file in required peer
3. Exit
1
Enter the peer name in the format of p1, p2, etc :
p2
```



```
Select vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-3
vaishnavim@Vaishu-Laptop:/mnt/d/PA22/Peer-3$ java Peer /mnt/d/PA22/Peer-3/peer-3-input-copy.txt download /mnt/d/PA22/Peer-3/Files/output-file.txt 1-node
1.Set up peer
2.Search and download file in required peer
3.Exit
1
Enter the peer name in the format of p1, p2, etc :
p3
```

```
Select vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-4
vaishnavim@Vaishu-Laptop:/mnt/d/PA22/Peer-4$ java Peer /mnt/d/PA22/Peer-4/peer-4-input-copy.txt download /mnt/d/PA22/Peer-4/Files/output-file.txt 1-node
1.Set up peer
2.Search and download file in required peer
3.Exit
1
Enter the peer name in the format of p1, p2, etc :
p4
```

```
Select vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-5
vaishnavim@Vaishu-Laptop: /mnt/d/PA22/Peer-5$ java Peer /mnt/d/PA22/Peer-5/peer-5-input-copy.txt download /mnt/d/PA22/Peer-5/Files/output-file.txt 1-node

1. Set up peer
2. Search and download file in required peer
3. Exit
4.
Enter the peer name in the format of p1, p2, etc :
p5
```

After running the files are downloaded to respective Files folder

