COE 4DN4 LAB 3 REPORT

A MUTI-THREADED PEER TO PEER SHARING APPLICATION "MACTELLA"

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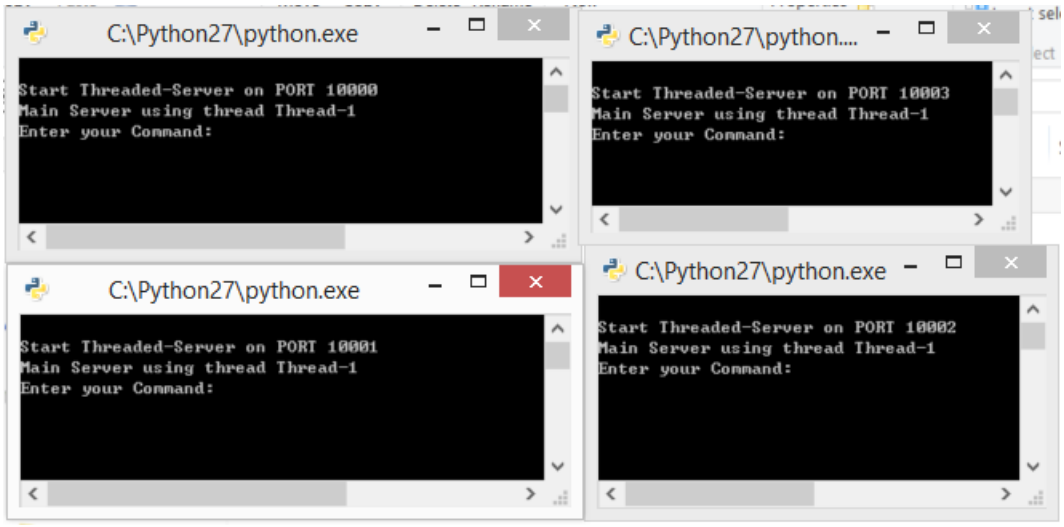
Introduction

This lab is motivated by “Nutella”, which became a very popular file sharing system after Napster’s central server got shut down by the FCC. Nutella the successor, introduced a brand new concept of file sharing, “Peer to Peer” file sharing. Instead of having a centralized server, everyone in the network becomes a server. Clients can now share files from other clients, every client becomes essentially a server themselves. This network structure avoided being shut downed by a organization because of the vast amount of servers in the network. This concept became highly adopted nowadays in our modern file sharing network.

Experimental Results

Results are for one peer only, because all peers have the same results.



LISTL, list all local files

```
Enter your Command:
LISTL
picture   I am peer 1.jpg          size: 119936 bytes
PDF       p1.pdf   size: 189000 bytes

Enter your Command:
```

LISTL, with no files in the directory

```
Enter your Command:
LISTL
There is no files in the directory
Enter your Command:
```

LISTR <remote_ip_address><port number> , list all files at peer’s directory

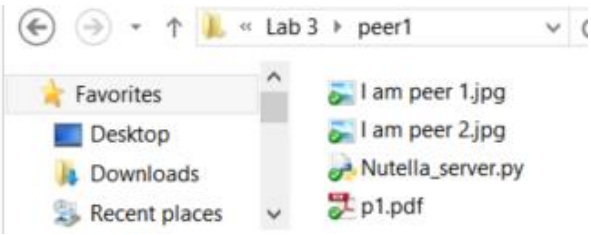
```
Enter your Command:
LISTR,localhost,10001
picture   I am peer 2.jpg          size: 119936 bytes
PDF       p2.pdf   size: 189000 bytes

Enter your Command:
```

LISTR <remote_ip_address><port number>, with no files at the peer's directory

```
Enter your Command:
LISTR,localhost,10001
There is no files in the directory
Enter your Command:
```

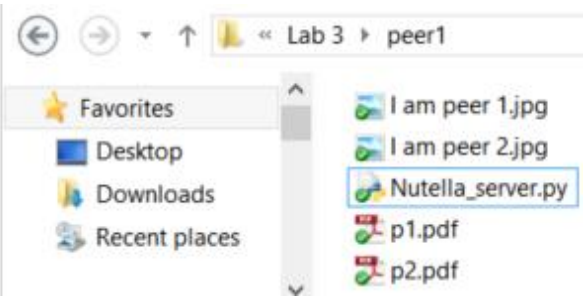
GET <file> <remote_IP_Address>, getting an image file.

```
Enter your Command:
GET,I am peer 2.jpg,localhost,10001
File Received
Enter your Command:
```



GET <file> <remote_IP_Address>, getting a PDF file.

```
Enter your Command:
GET,p2.pdf,localhost,10001
File Received
Enter your Command:
```



SEARCH <filename> <TT>, a file in **peer 4**,(3 hops away), with 2 hops to live, expecting no results.

```
SEARCH,p4.pdf,2
Enter your Command:
```

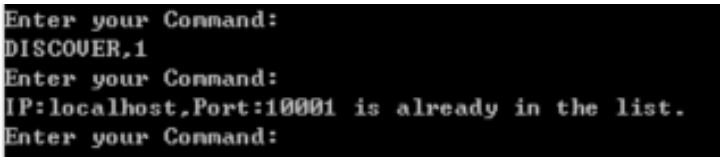
SEARCH <filename> <TT>, a file in **peer 4**,(3 hops away), with 3 hops to live, expecting results.

```
Enter your Command:
SEARCH,p4.pdf,3
Enter your Command:
File has been found at IP_Address: localhost Port: 10003

Enter your Command:
```

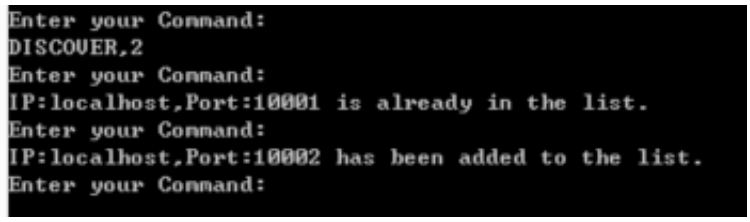
SEARCH <filename> <TT>, a file in peer 3, (2 hops away), with 2 hops to live, expecting results.

```
Enter your Command:
SEARCH,p2.pdf,2
Enter your Command:
File has been found at IP_Address: localhost Port: 10001

Enter your Command:
```

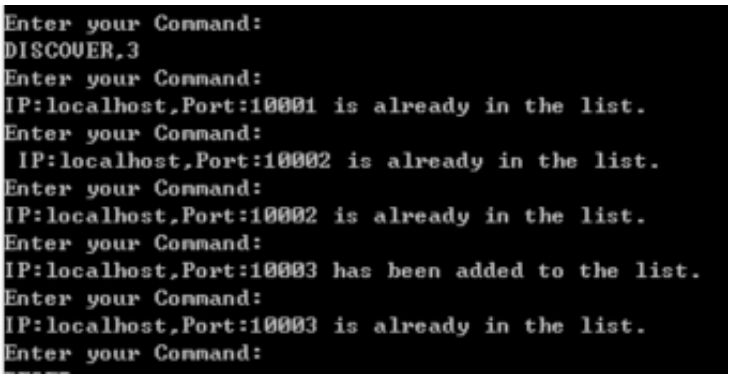
DISCOVER <1>, peer A already knows about peer B, expecting no change to the list.



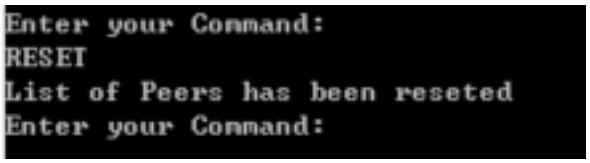
DISCOVER <2>, peer A will add peer C to its list but it will not add peer B since it is already in the list.



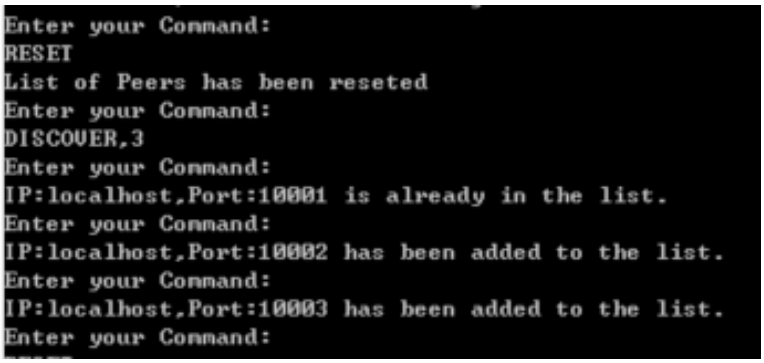
DISCOVER <3>, peer A will add peer D and peer C to its list but it will not add peer B since It is already in the list



RESET, peer A will reset its list



Proof, DISCOVER,3 re-added peer C and D to its list.



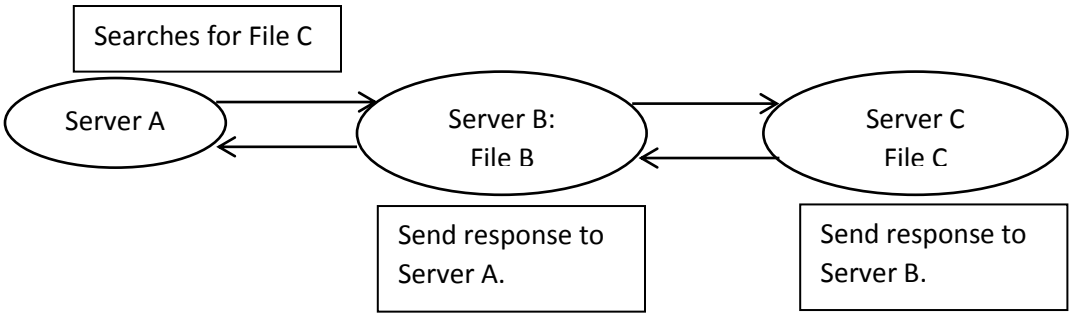
QUIT, will exit the program

```
Enter your Command:
QUIT
Main server thread shutting down the server and terminating

C:\Users\dave\Dropbox\4DN4\Lab 3\peer1>
```

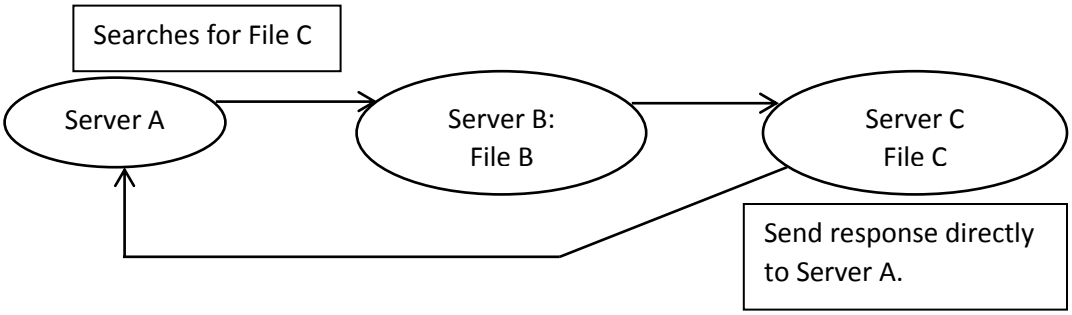
Issues and problems

The first problem we encountered was the issue with the Search function of the network, shown below:

Plan A:



Plan B:



We choose Plan B for our implementation, because it is a more simple way of communication between peers, also it saves time to transfer between peers. The lab description could be made more clear to exactly how each function should work, and exactly how peer's should communicate, because we also encountered some ambiguity during the application's development.

TA's name for demonstration

We demonstrated to **Haleh Shahzad** on **Wednesday, April 1, 2015**.

Conclusion

In Summary, this project allows us to learn and explore about P2P communication and the fundamentals design concepts of a P2P system. We experienced the advantage P2P provides, the benefit of not having a single server, and the easiness of the scalability of the P2P system. The disadvantages we noted was that if the network has too many peers, the network might

have higher delay. Additionally, this lab give us a understand of how more modern file sharing communication systems operates, and gave us the knowledge to implement and expand on to our own ideas for future network application development.