

Programming Project – 4

CS5352 Advanced Operating Systems Design

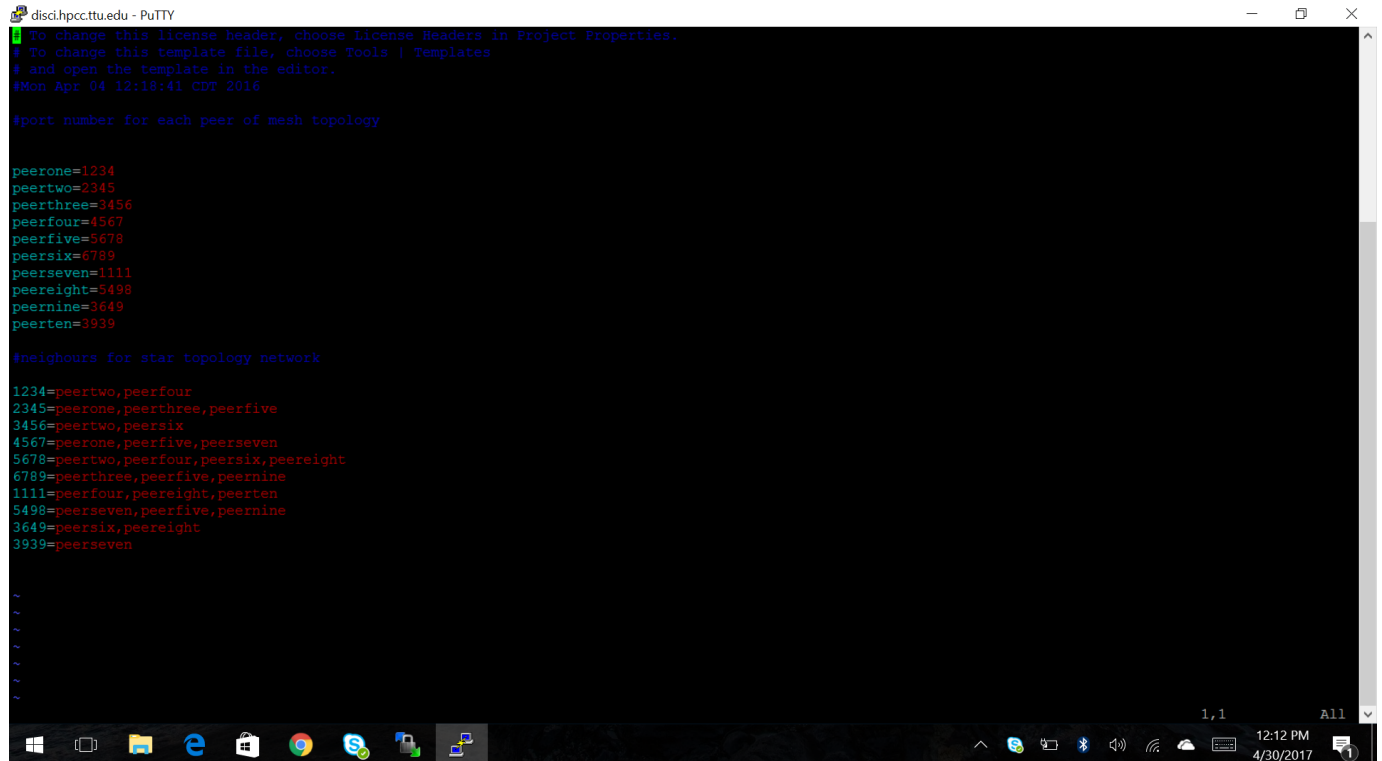
Gnutella File Sharing System with push based approach

Output Screenshots

Manisha Siddartha Nalla

Mesh Topology(mesh.properties):

Command: vi mesh.properties



```
discihpcc.ttu.edu - PuTTY
To change this license header, choose License Headers in Project Properties.
# To change this template file, choose Tools | Templates
# and open the template in the editor.
#Mon Apr 04 12:18:41 CDT 2016

#port number for each peer of mesh topology

peerone=1234
peertwo=2345
peerthree=3456
peerfour=4567
peerfive=5678
peersix=6789
peerseven=1111
peereight=5498
peernine=3649
peerten=3939

#neighbours for star topology network

1234=peertwo,peerfour
2345=peerone,peerthree,peerfive
3456=peertwo,peersix
4567=peerone,peerfive,peerseven
5678=peertwo,peerfour,peersix,peereight
6789=peerthree,peerfive,peernine
1111=peerfour,peereight,peerten
5498=peerseven,peerfive,peernine
3649=peersix,peereight
3939=peerseven

~
~
~
~
~
~
~
1,1 All
```

Command: `vi star.properties`

```
disci.hpcctu.edu - PuTTY
Tue Apr 18 12:18:41 CDT 2017

#port number for each peer of star topology
peerone=1234
peertwo=2345
peerthree=3456
peerfour=4567
peerfive=5678
peersix=6789
peerseven=1111
peereight=5498
peernine=3649
peerten=3939

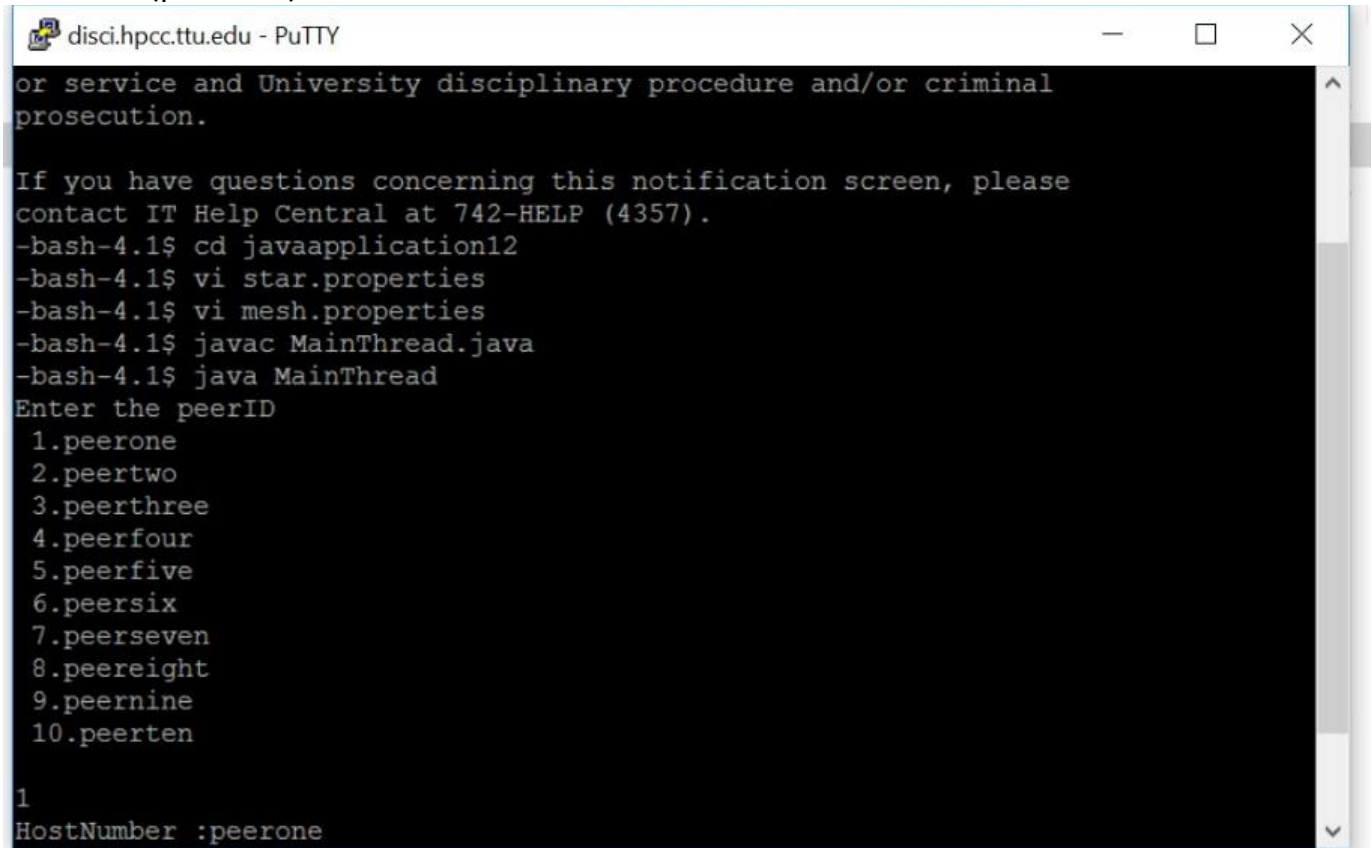
#neighbours for star topology network
1234=peertwo,peerthree,peerfour,peerfive,peersix,peerseven,peereight,peernine,peerten
2345=peerone
3456=peerone
4567=peerone
5678=peerone
6789=peerone
1111=peerone
5498=peerone
3649=peerone
3939=peerten
```

Program execution:

Start peerone server:

Command:

- Compiling – `javac MainThread.java`
- Execution – `java MainThread`
- Select – 1(peerone)



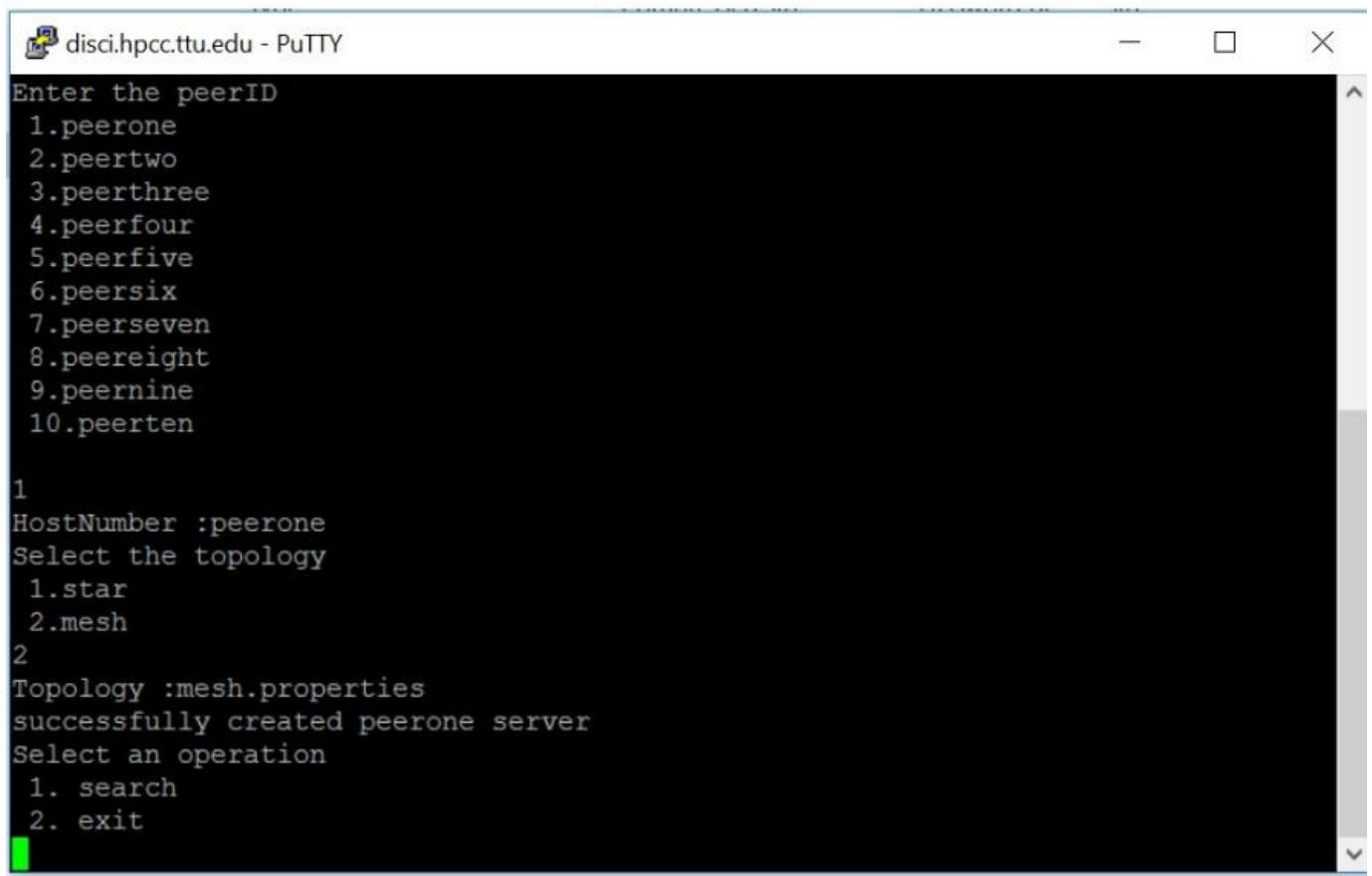
The screenshot shows a PuTTY terminal window titled "disci.hpcc.ttu.edu - PuTTY". The terminal displays the following text:

```
or service and University disciplinary procedure and/or criminal
prosecution.

If you have questions concerning this notification screen, please
contact IT Help Central at 742-HELP (4357).
-bash-4.1$ cd javaapplication12
-bash-4.1$ vi star.properties
-bash-4.1$ vi mesh.properties
-bash-4.1$ javac MainThread.java
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

1
HostNumber :peerone
```

- Select – 1(star.properties) or 2(mesh.properties)



```
disci.hpcc.ttu.edu - PuTTY
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

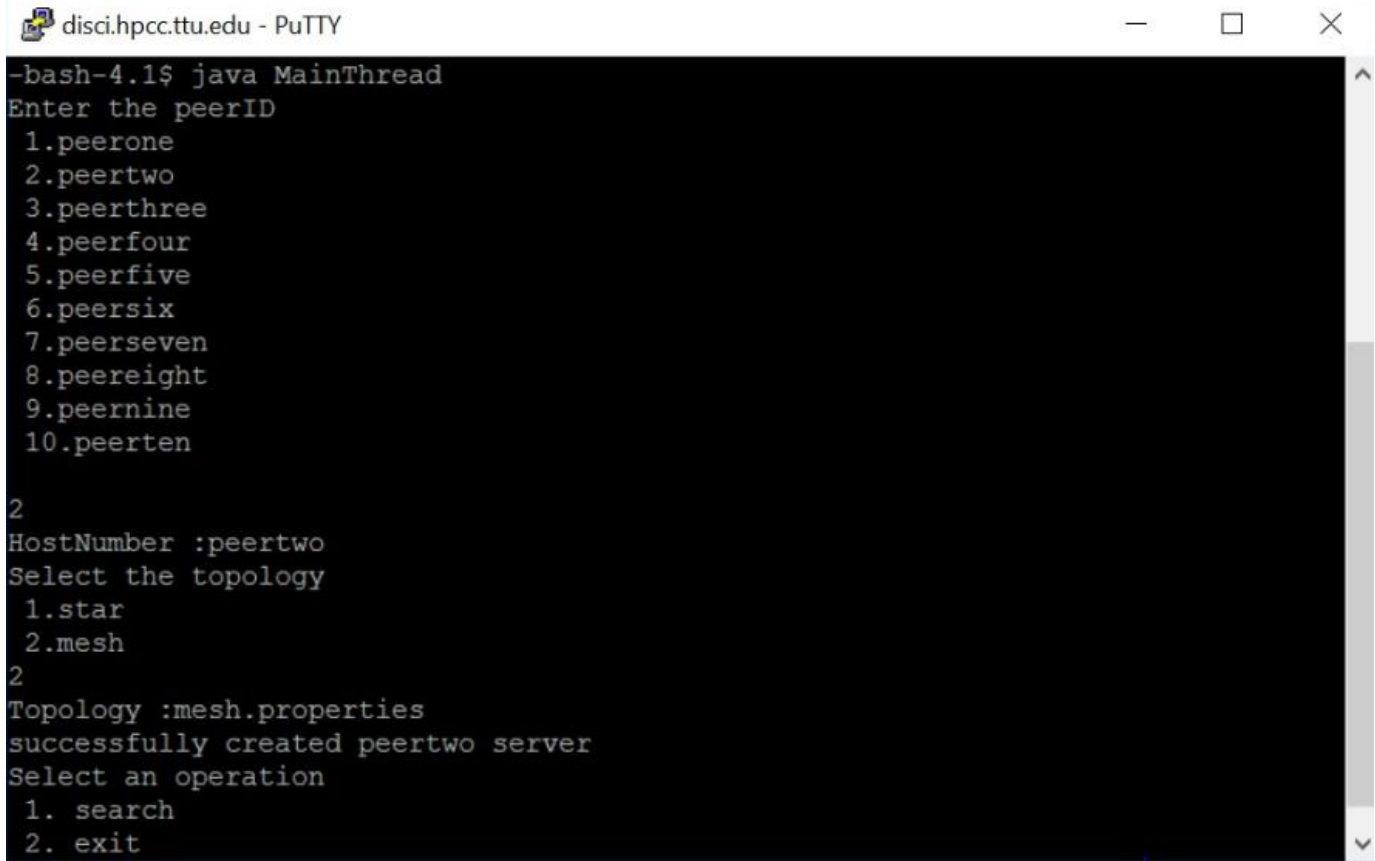
1
HostNumber :peerone
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerone server
Select an operation
1. search
2. exit
```

Note: Run all the peers concurrently in different terminals

Start peertwo server:

Command:

- Execution – java MainThread
- Select – 2(peertwo)
- Select – 1(star.properties) or 2(mesh.properties)



```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

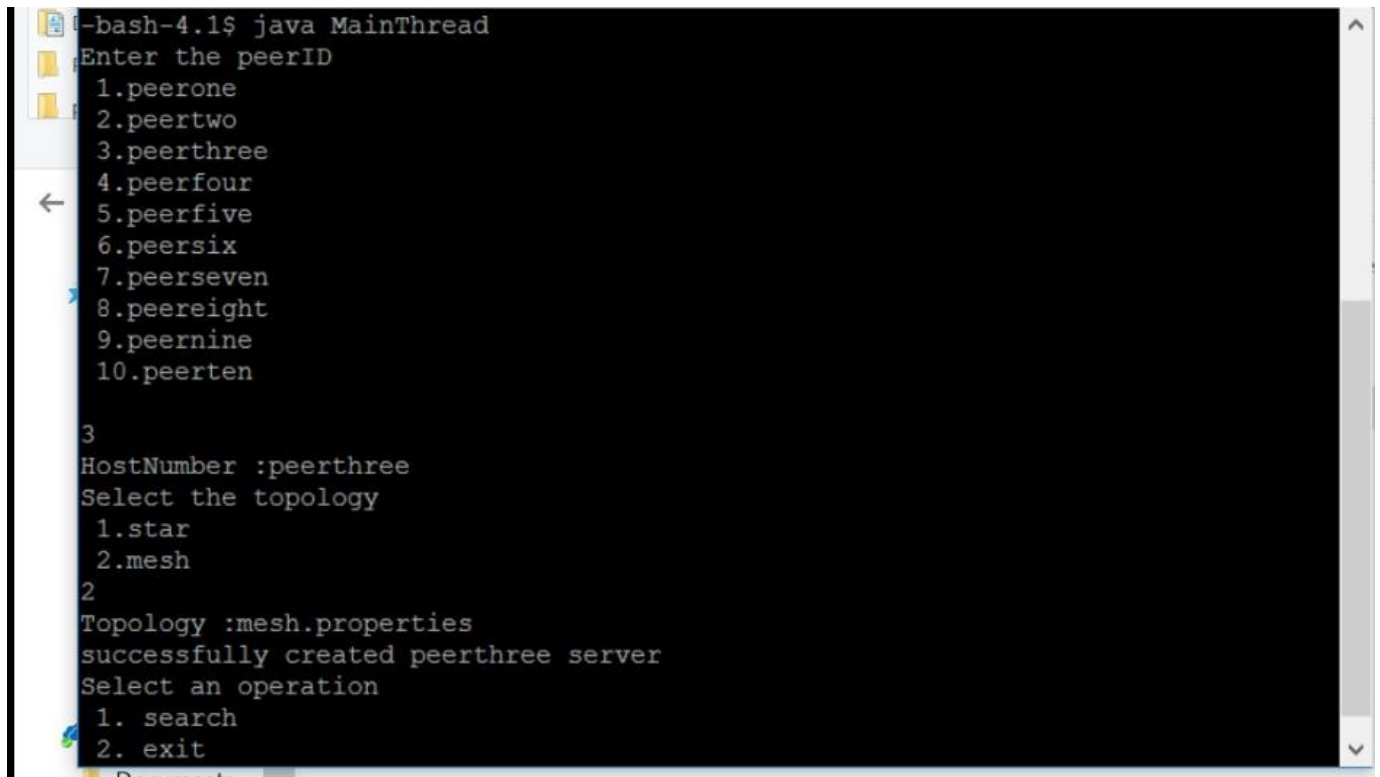
2
HostNumber :peertwo
Select the topology
1.star
2.mesh

2
Topology :mesh.properties
successfully created peertwo server
Select an operation
1. search
2. exit
```

Start peerthree server:

Command:

- Execution – java MainThread
- Select – 3(peerthree)
- Select – 1(star.properties) or 2(mesh.properties)



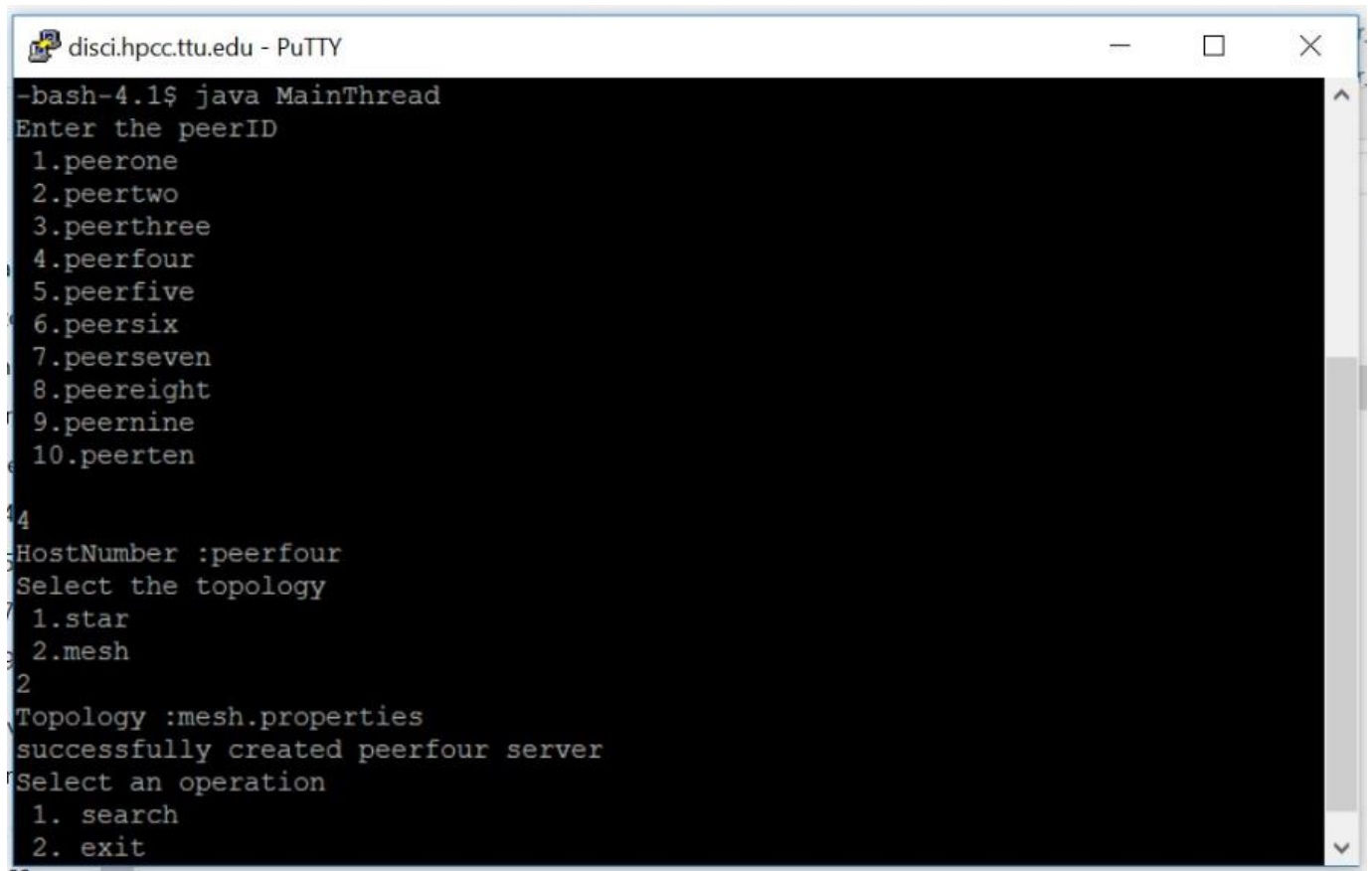
```
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

3
HostNumber :peerthree
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerthree server
Select an operation
1. search
2. exit
```

Start peerfour server:

Command:

- Execution – java MainThread
- Select – 4(peerfour)
- Select – 1(star.properties) or 2(mesh.properties)

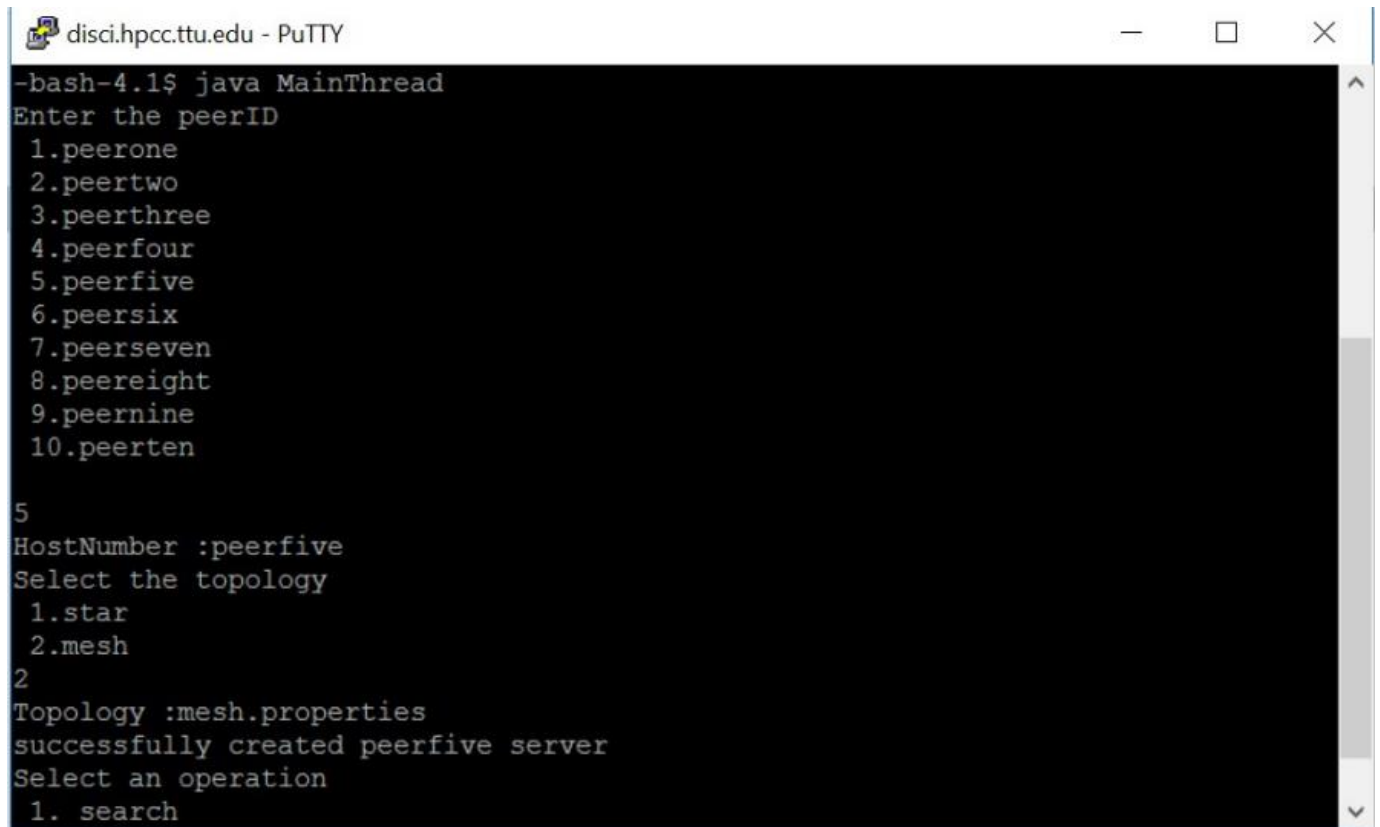


```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten
4
HostNumber :peerfour
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerfour server
Select an operation
1. search
2. exit
```

Start peerfive server:

Command:

- Execution – java MainThread
- Select – 5(peerfive)
- Select – 1(star.properties) or 2(mesh.properties)



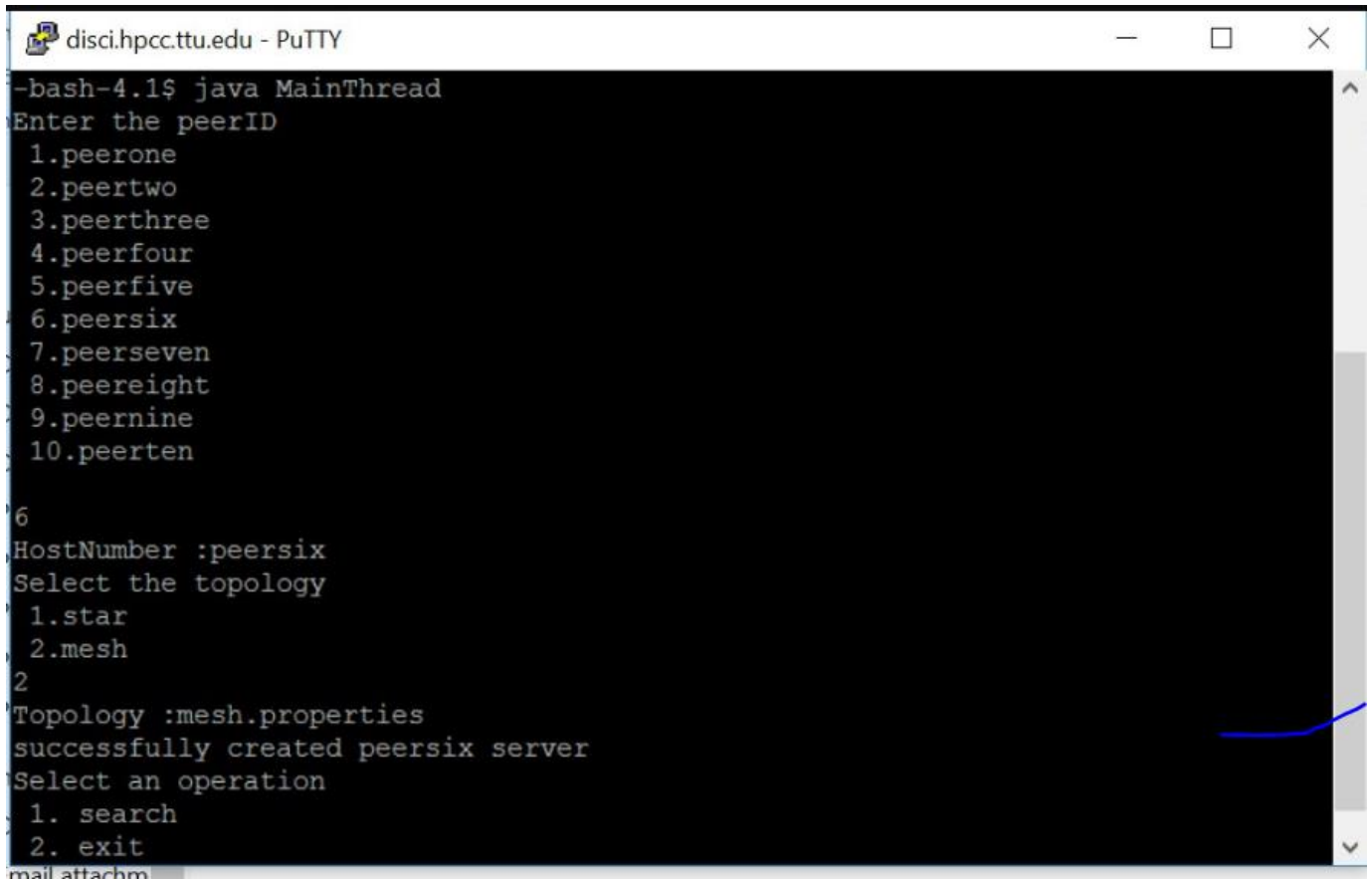
```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

5
HostNumber :peerfive
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerfive server
Select an operation
1. search
```


Start peersix server:

Command:

- Execution – java MainThread
- Select – 6(peersix)
- Select – 1(star.properties) or 2(mesh.properties)

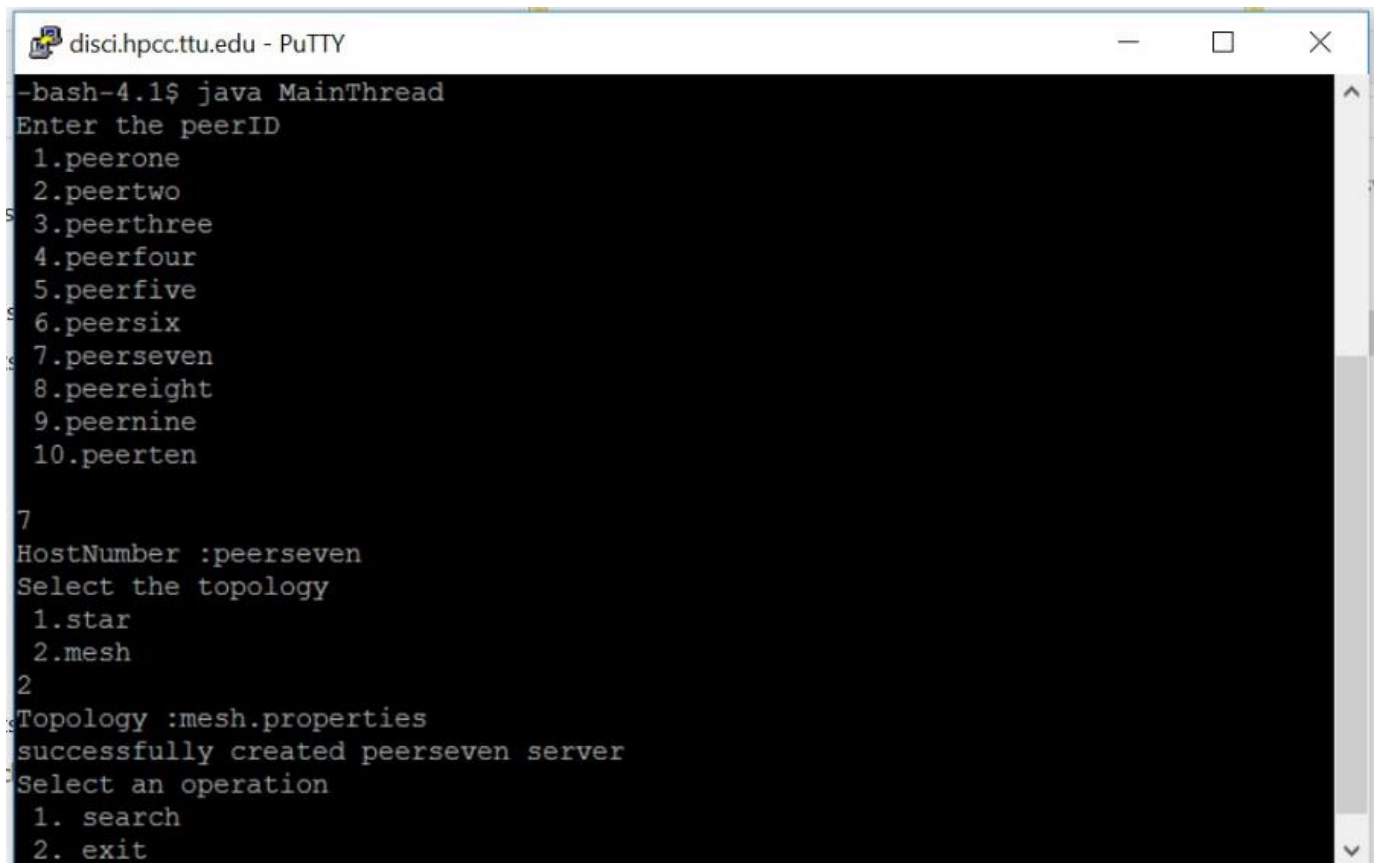


```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten
6
HostNumber :peersix
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peersix server
Select an operation
1. search
2. exit
mail attachm
```

Start peerseven server:

Command:

- Execution – java MainThread
- Select – 7(peerseven)
- Select – 1(star.properties) or 2(mesh.properties)



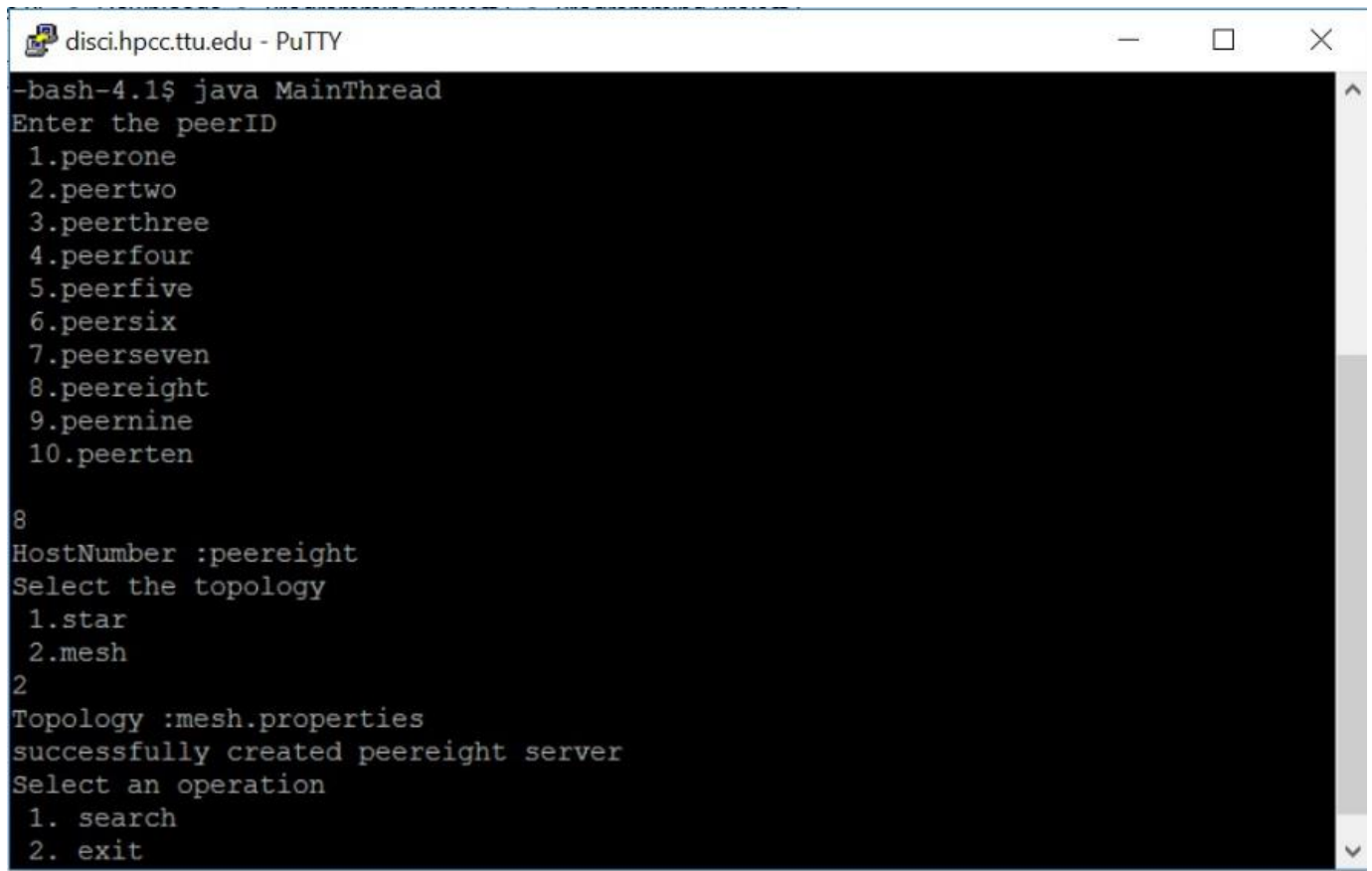
```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

7
HostNumber :peerseven
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerseven server
Select an operation
1. search
2. exit
```

Start peereight server:

Command:

- Execution – java MainThread
- Select – 8(peereight)
- Select – 1(star.properties) or 2(mesh.properties)



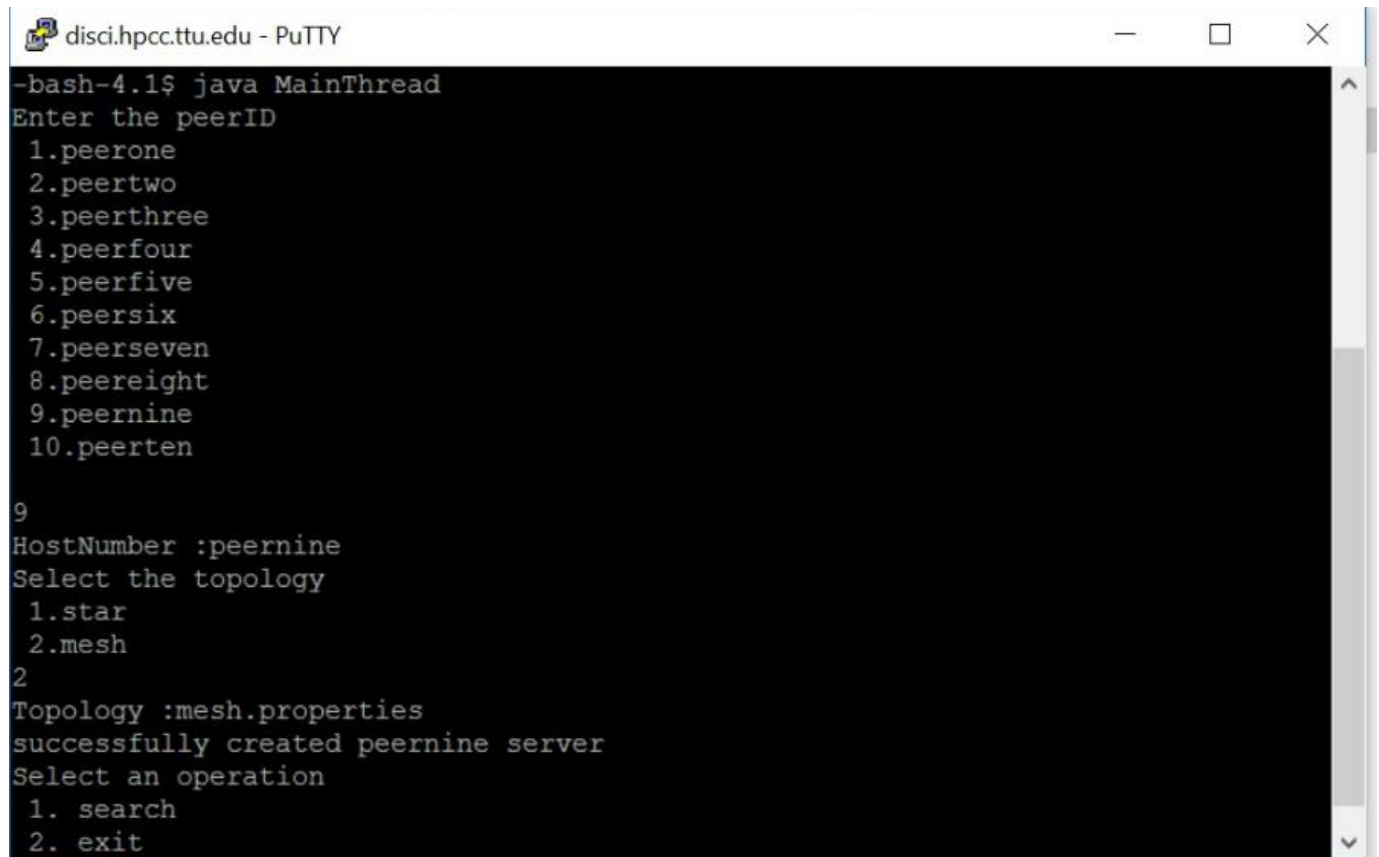
```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

8
HostNumber :peereight
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peereight server
Select an operation
1. search
2. exit
```

Start peernine server:

Command:

- Execution – java MainThread
- Select – 9(peernine)
- Select – 1(star.properties) or 2(mesh.properties)



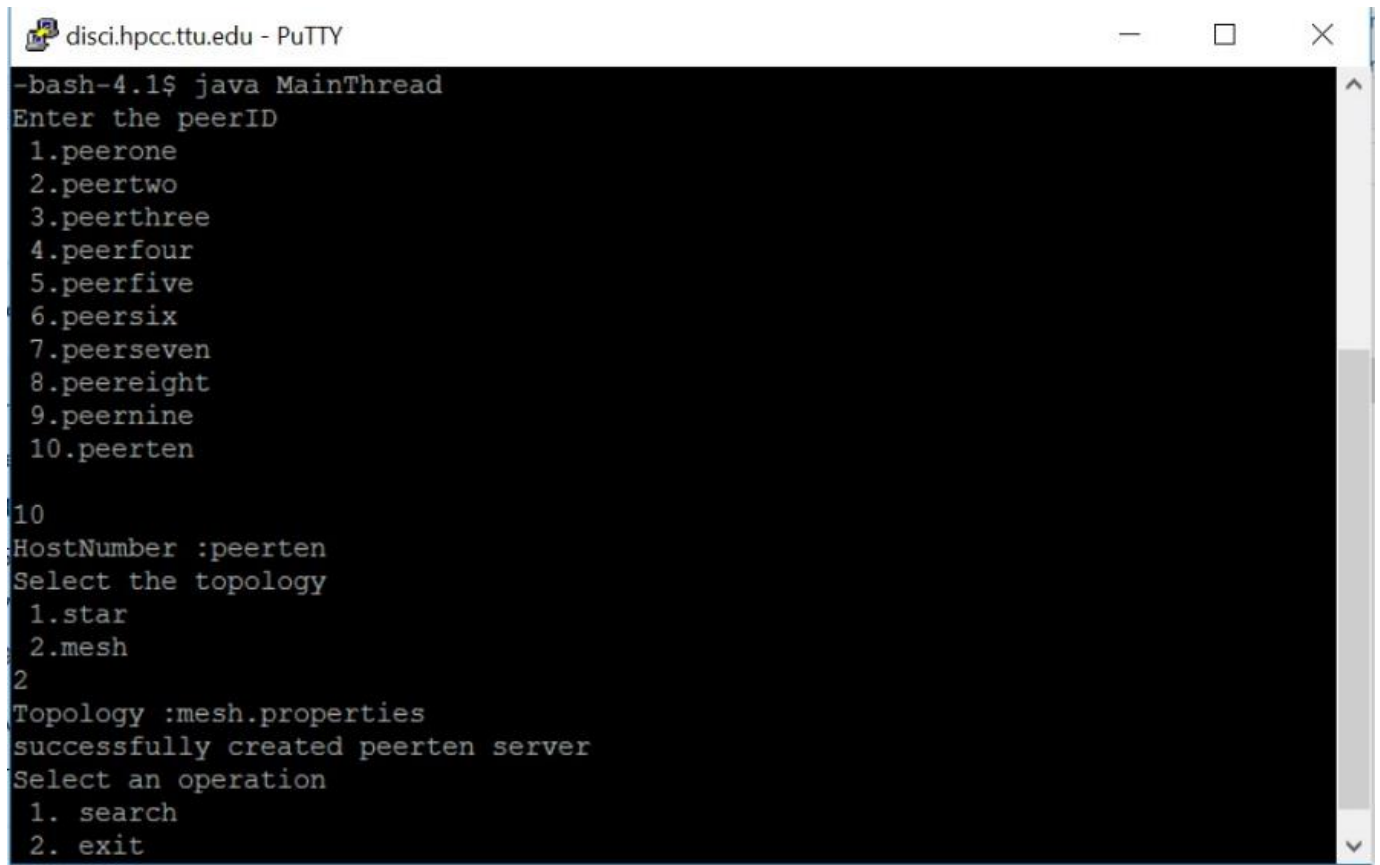
```
disci.hpc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

9
HostNumber :peernine
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peernine server
Select an operation
1. search
2. exit
```

Start peerten server:

Command:

- Execution – java MainThread
- Select – 10(peerten)
- Select – 1(star.properties) or 2(mesh.properties)



```
disci.hpcc.ttu.edu - PuTTY
-bash-4.1$ java MainThread
Enter the peerID
1.peerone
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

10
HostNumber :peerten
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerten server
Select an operation
1. search
2. exit
```

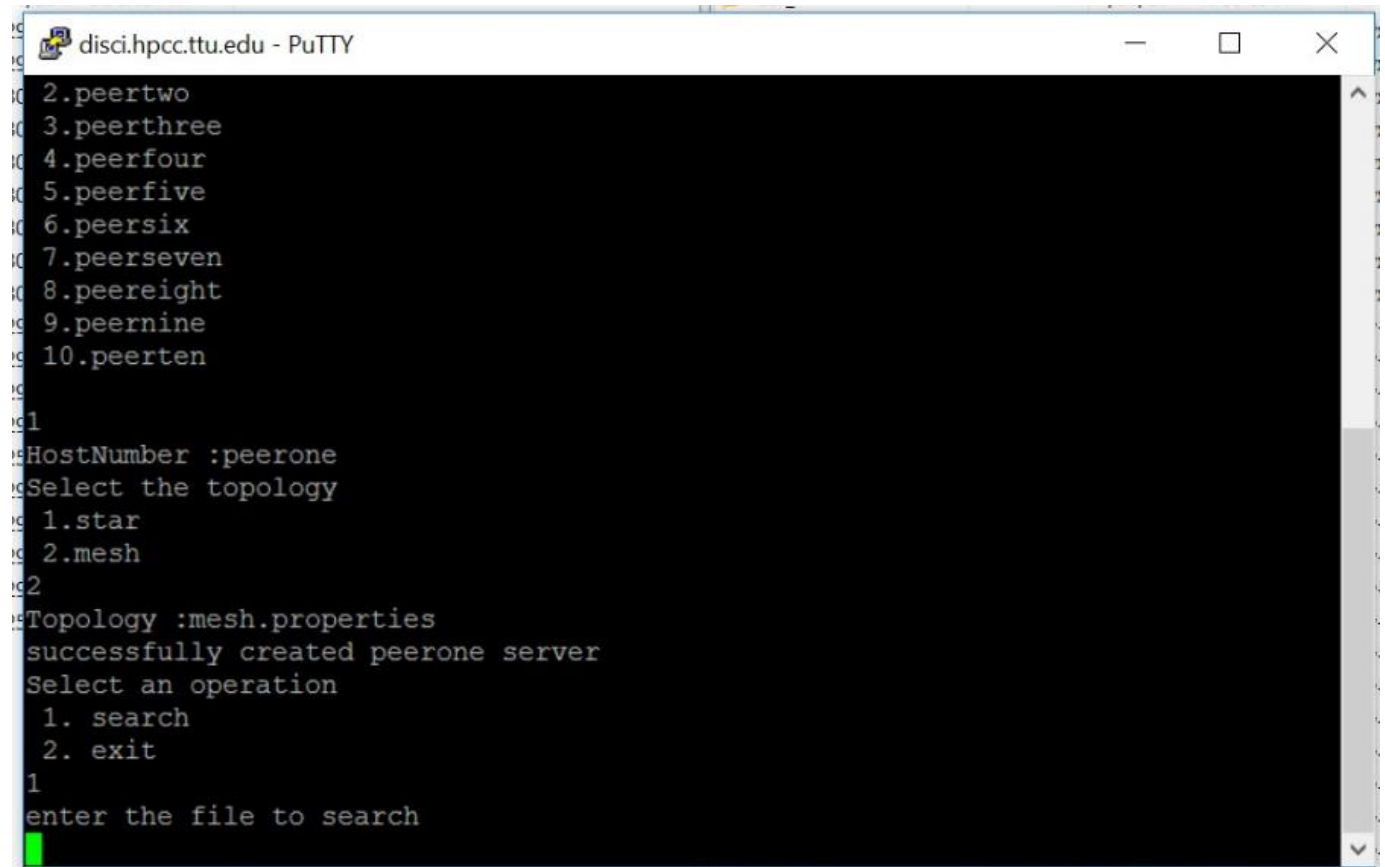
Searching file operation

Navigate to any of the peer client terminal

In this example I have navigated to **peerone** client to perform search operation

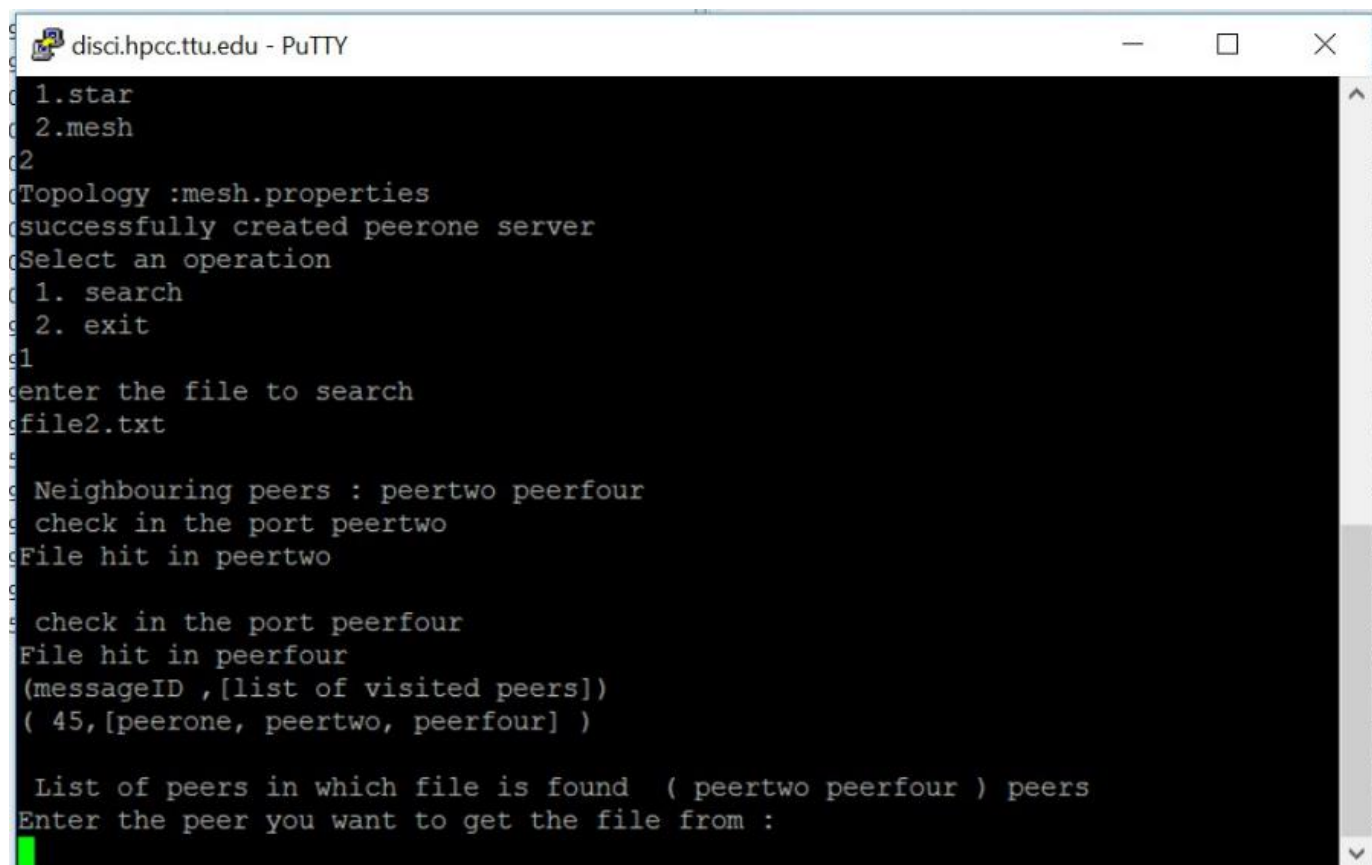
Command:

Select - 1(Search Operation)

A screenshot of a PuTTY terminal window titled "disci.hpc.ttu.edu - PuTTY". The terminal displays a menu of peer clients (2.peertwo to 10.peerten), followed by a selection of "1" and the command "HostNumber :peerone". It then prompts to "Select the topology" with options "1.star" and "2.mesh", where "2" is selected. This leads to "Topology :mesh.properties" and the message "successfully created peerone server". A prompt "Select an operation" shows options "1. search" and "2. exit", with "1" selected. Finally, it prompts "enter the file to search" with a green cursor on a new line.

```
disci.hpc.ttu.edu - PuTTY
2.peertwo
3.peerthree
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten
1
HostNumber :peerone
Select the topology
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerone server
Select an operation
1. search
2. exit
1
enter the file to search
█
```

Command : file2.txt(Any other file u wish to search):



```
disci.hpcc.ttu.edu - PuTTY
1.star
2.mesh
2
Topology :mesh.properties
successfully created peerone server
Select an operation
1. search
2. exit
1
Enter the file to search
file2.txt

Neighbouring peers : peertwo peerfour
check in the port peertwo
File hit in peertwo

check in the port peerfour
File hit in peerfour
(messageID ,[list of visited peers])
( 45,[peerone, peertwo, peerfour] )

List of peers in which file is found ( peertwo peerfour ) peers
Enter the peer you want to get the file from :
```

So the given file is found in the immediate neighbors peertwo and peerfour

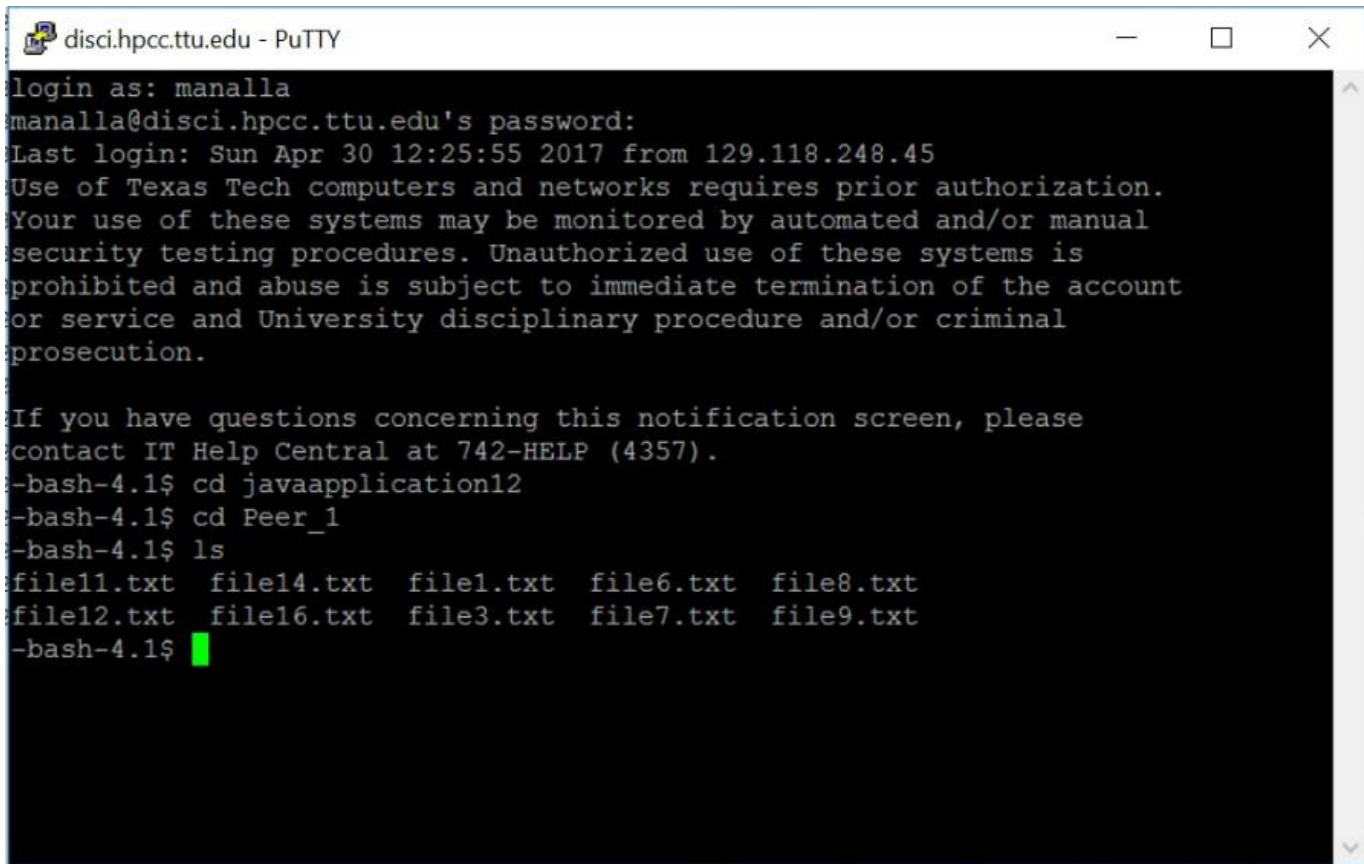
Alternate cases:

- file is not found in immediate levels so it searches in next levels
- Time to live value is expired before the file is found (overcome this by searching from other peers)

Check files in peer1 before transfer

Command:

- cd Peer_1
- ls



```
disci.hpcc.ttu.edu - PuTTY
login as: manalla
manalla@disci.hpcc.ttu.edu's password:
Last login: Sun Apr 30 12:25:55 2017 from 129.118.248.45
Use of Texas Tech computers and networks requires prior authorization.
Your use of these systems may be monitored by automated and/or manual
security testing procedures. Unauthorized use of these systems is
prohibited and abuse is subject to immediate termination of the account
or service and University disciplinary procedure and/or criminal
prosecution.

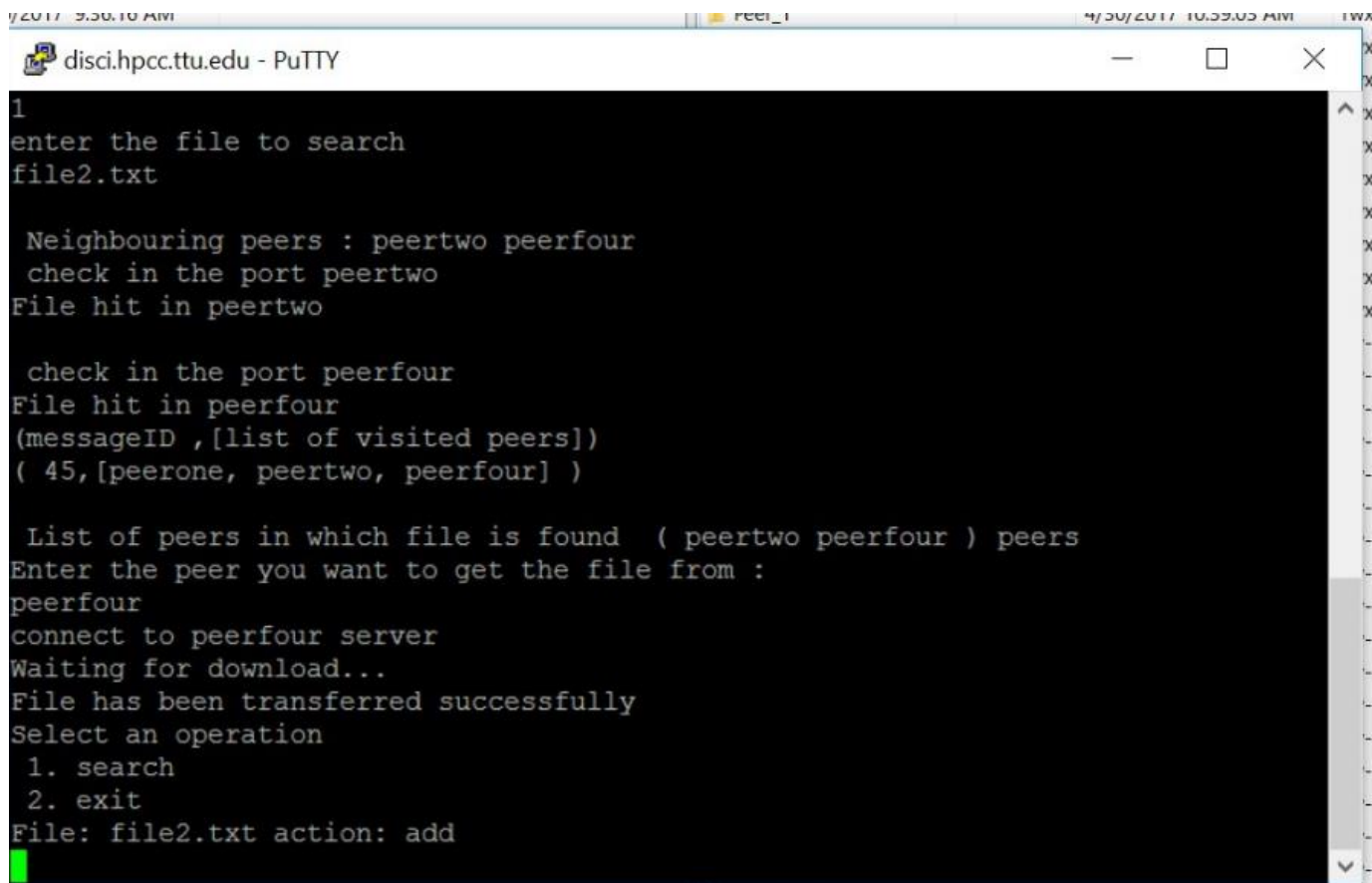
If you have questions concerning this notification screen, please
contact IT Help Central at 742-HELP (4357).
-bash-4.1$ cd javaapplication12
-bash-4.1$ cd Peer_1
-bash-4.1$ ls
file11.txt  file14.txt  file1.txt  file6.txt  file8.txt
file12.txt  file16.txt  file3.txt  file7.txt  file9.txt
-bash-4.1$
```

File2.txt is not found before transfer

Transferring file:

Command:

Select – peerfour(or peertwo)

A screenshot of a PuTTY terminal window titled 'disci.hpc.ttu.edu - PuTTY'. The terminal shows a sequence of commands and responses. It starts with '1' and 'enter the file to search', followed by 'file2.txt'. Then it lists 'Neighbouring peers : peertwo peerfour', checks 'peertwo' and finds the file, then checks 'peerfour' and also finds it. It shows a list of visited peers and a list of peers where the file is found. The user selects 'peerfour' to get the file. The terminal shows 'connect to peerfour server', 'Waiting for download...', and 'File has been transferred successfully'. It then prompts for an operation, with options '1. search' and '2. exit'. Finally, it shows 'File: file2.txt action: add'.

```
1
enter the file to search
file2.txt

Neighbouring peers : peertwo peerfour
check in the port peertwo
File hit in peertwo

check in the port peerfour
File hit in peerfour
(messageID ,[list of visited peers])
( 45,[peerone, peertwo, peerfour] )

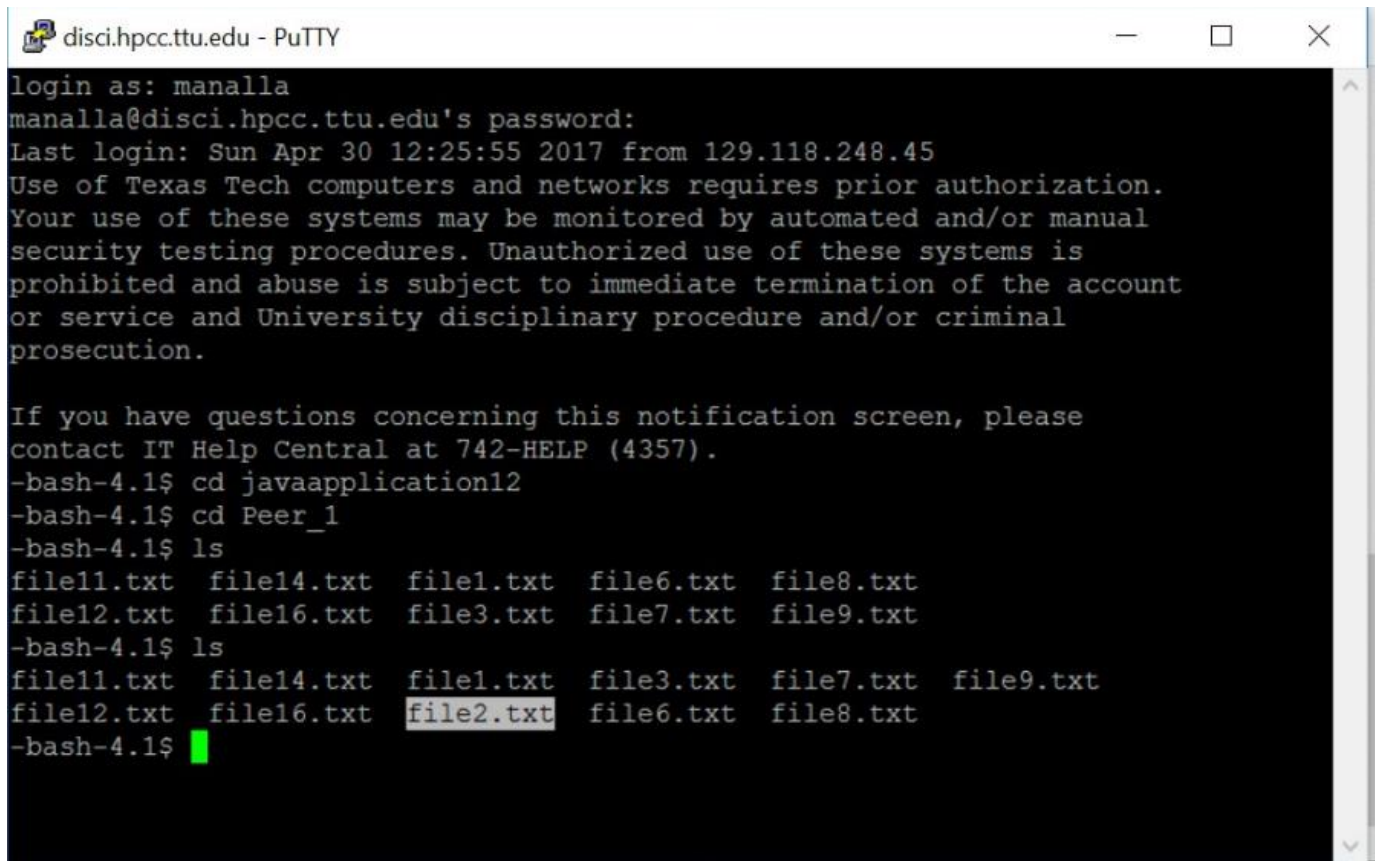
List of peers in which file is found ( peertwo peerfour ) peers
Enter the peer you want to get the file from :
peerfour
connect to peerfour server
Waiting for download...
File has been transferred successfully
Select an operation
1. search
2. exit
File: file2.txt action: add
```

As it is a push based approach there will be a file monitoring thread which constantly checks for the changes happening in the peer server. Hence it returns action: add because a new file is added into the peerone server

Open peer_1 directory to check if file has been transferred

Command:

- cd peer_1
- ls



The screenshot shows a PuTTY terminal window titled "disci.hpcc.ttu.edu - PuTTY". The user "manalla" has logged in. The terminal displays a login banner with university policies. The user then navigates to the "javaapplication12" directory and then to the "Peer_1" directory. Two "ls" commands are executed. The first "ls" shows files: file11.txt, file14.txt, file1.txt, file6.txt, file8.txt, file12.txt, file16.txt, file3.txt, file7.txt, and file9.txt. The second "ls" shows the same files plus "file2.txt", which is highlighted with a green background. The prompt "-bash-4.1\$" is visible at the end of the line.

```
disci.hpcc.ttu.edu - PuTTY
login as: manalla
manalla@disci.hpcc.ttu.edu's password:
Last login: Sun Apr 30 12:25:55 2017 from 129.118.248.45
Use of Texas Tech computers and networks requires prior authorization.
Your use of these systems may be monitored by automated and/or manual
security testing procedures. Unauthorized use of these systems is
prohibited and abuse is subject to immediate termination of the account
or service and University disciplinary procedure and/or criminal
prosecution.

If you have questions concerning this notification screen, please
contact IT Help Central at 742-HELP (4357).
-bash-4.1$ cd javaapplication12
-bash-4.1$ cd Peer_1
-bash-4.1$ ls
file11.txt  file14.txt  file1.txt  file6.txt  file8.txt
file12.txt  file16.txt  file3.txt  file7.txt  file9.txt
-bash-4.1$ ls
file11.txt  file14.txt  file1.txt  file3.txt  file7.txt  file9.txt
file12.txt  file16.txt  file2.txt  file6.txt  file8.txt
-bash-4.1$
```

File2.txt has been transferred in peer_1 directory

Modifying the contents of file

Contents of file in both the peers before modification:

Peer_4:



A screenshot of a PuTTY terminal window titled "disci.hpcc.ttu.edu - PuTTY". The terminal displays the contents of a file named "file2.txt". The file contains a single line of text: "file2.txt" [noeol] 1L, 9C. The status bar at the bottom right shows "1,1" and "All".

Peer_1:



A screenshot of a PuTTY terminal window titled "disci.hpcc.ttu.edu - PuTTY". The terminal displays the contents of a file named "file2.txt". The file contains a single line of text: "file2.txt" [noeol] 1L, 9C. The status bar at the bottom right shows "1,1" and "All".

Commands:

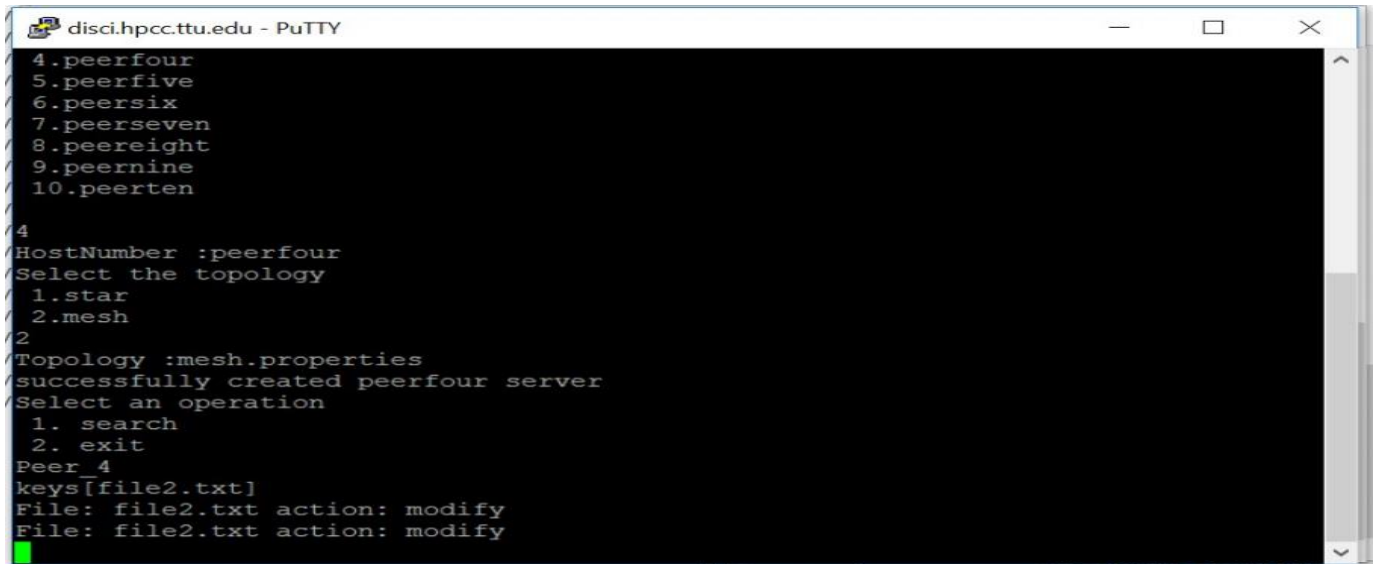
- Open file2.txt(Master file) in Peer_4 directory : cd Peer_4, vi file2.txt
Change the contents of file and **save** (esc+:wq) the file



The screenshot shows a PuTTY terminal window titled "disci.hpcc.ttu.edu - PuTTY". The terminal output displays the message "file2.txt has been modified" on the first line. Subsequent lines show a series of tilde (~) characters, likely representing a directory listing or a series of prompts. At the bottom of the terminal, the status bar indicates the current file is "file2.txt" with 1 line and 28 characters, and the cursor is at line 1, column 1. The window includes standard PuTTY window controls (minimize, maximize, close) in the top right corner.

Open terminal of peerfour clients:

As it is a push based approach the thread for file monitoring detects the file changes and displays file has been modified on **peerfour terminal**



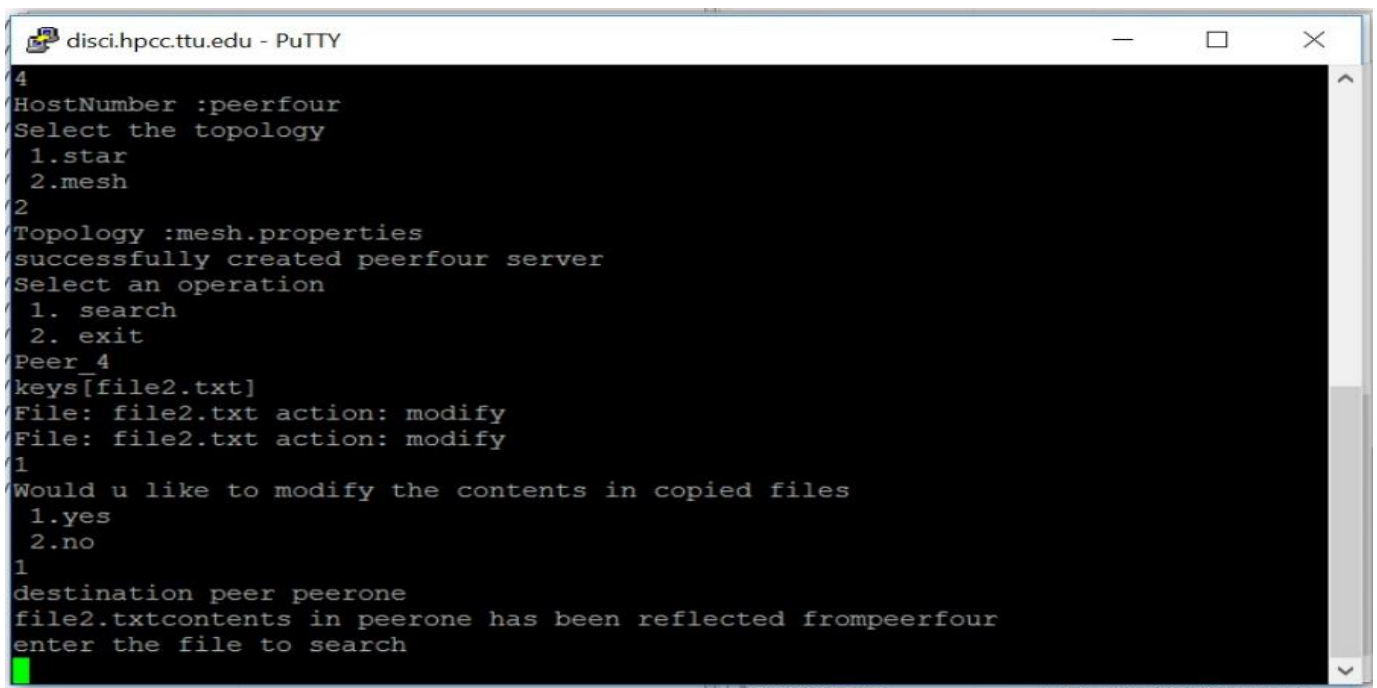
```
disci.hpc.ttu.edu - PuTTY
4.peerfour
5.peerfive
6.peersix
7.peerseven
8.peereight
9.peernine
10.peerten

4
HostNumber :peerfour
Select the topology
 1.star
 2.mesh
2
Topology :mesh.properties
successfully created peerfour server
Select an operation
 1. search
 2. exit
Peer_4
keys[file2.txt]
File: file2.txt action: modify
File: file2.txt action: modify
```

Now Continue executing peer4 client

Command : Select-1 (search operation)

Now it shows a prompt asking if you want to reflect the modified changes in cached file



```
disci.hpc.ttu.edu - PuTTY
4
HostNumber :peerfour
Select the topology
 1.star
 2.mesh
2
Topology :mesh.properties
successfully created peerfour server
Select an operation
 1. search
 2. exit
Peer_4
keys[file2.txt]
File: file2.txt action: modify
File: file2.txt action: modify
1
Would u like to modify the contents in copied files
 1.yes
 2.no
1
destination peer peerone
file2.txtcontents in peerone has been reflected frompeerfour
enter the file to search
```

Commands :

- ```
disci.hpcc.ttu.edu - PuTTY
or service and University disciplinary procedure and/or criminal
prosecution.

If you have questions concerning this notification screen, please
contact IT Help Central at 742-HHELP (4357).
-bash-4.1$ cd javaapplication12
-bash-4.1$ cd Peer_1
-bash-4.1$ ls
file11.txt file14.txt file1.txt file6.txt file8.txt
file12.txt file16.txt file3.txt file7.txt file9.txt
-bash-4.1$ ls
file11.txt file14.txt file1.txt file3.txt file7.txt file9.txt
file12.txt file16.txt file2.txt file6.txt file8.txt
-bash-4.1$ vi file2.txt
-bash-4.1$ cd ..
-bash-4.1$ cd Peer_2
-bash-4.1$ cd ..
-bash-4.1$ cd Peer_4
-bash-4.1$ vi file2.txt
-bash-4.1$ vi file2.txt
-bash-4.1$ vi file2.txt
-bash-4.1$ cd ..
-bash-4.1$ cd Peer_1
-bash-4.1$ vi file2.txt
```

Changes have been reflected in file2.txt of Peer\_1 server