

# Manual

## A Simple Peer to Peer File Sharing System

Step 1: - (Initializing the index server and the three individual servers )

For setting up the index server we need to give the command as given below

```
python3 IndexServer.py
```

And for the three individual servers we need three different directories on local host and three different port number.

For server 1, we use peer1 as directory and 9036 as the port

```
python3 ~/Downloads/Peer1.py server peer1 localhost 9036
```

For server 2, we use peer3 as directory and 9037 as the port

```
python3 ~/Downloads/Peer1.py server peer2 localhost 9037
```

For server 3, we use peer3 as directory and 9038 as the port

```
python3 ~/Downloads/Peer1.py server peer3 localhost 9038
```

```
SERVER 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer1 localhost 9036
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
[]

SERVER 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer3 localhost 9038
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
[]

SERVER 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer2 localhost 9037
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
[]

INDEX SERVER (Python)
st|peer1|9036'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51094', '.DS_Store')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037', 'localhost|peer1|1035'}, '.DS_Store': {'localhost|peer3|9038', 'localhost|peer2|9037', 'localhost|peer1|9036'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51095', 'fiftykb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037', 'localhost|peer1|1035'}, '.DS_Store': {'localhost|peer3|9038', 'localhost|peer2|9037', 'localhost|peer1|9036'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer3|9038'}, 'fiftykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
```

Updated IndexServer

After the following commands we can see the updated IndexServer as shown in the above picture.

## Step 2: - (For setting up the clients )

For each server we create a client with the same directory and the same port number we used for the servers, and after every command the index server gets updated which is shown in the respected images below the commands.

## Step 3: - (Start first clients)

For every client there are different commands as follows:

For client 1, we use peer1 as directory and 9036 as the port

```
python3 ~/Downloads/Peer1.py client peer1 localhost 9036
```

The screenshot displays several terminal windows. On the left, 'SERVER 1 (Python)' shows the server starting and waiting for requests. 'SERVER 2 (Python)' shows a client request for 'twentykb.txt' and the server sending the file. 'SERVER 3 (Python)' shows the server starting. In the center, 'INDEX SERVER (Python)' shows the index being updated with file locations from the servers. On the right, 'CLIENT 1 (Python)' shows the client sending a file and receiving an update from the server. Below it, 'CLIENT 2 (bash)' shows the client command for peer2. At the bottom right, 'CLIENT 3 (bash)' shows the client command for peer1.

## Before update

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51088', 'onekb.txt')
{'onekb.txt': {'localhost|peer1|9036',
'tenkb.txt': {'localhost|peer1|9036'}}
```

## Searching for twentykb.txt and updated index

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51089', 'twentykb.txt')
{'onekb.txt': {'localhost|peer1|9036',
'tenkb.txt': {'localhost|peer1|9036'},
twentykb.txt': {'localhost|peer2|9037'}}
```

## Step 4: - (Start second clients)

For client 2, we use peer3 as directory and 9037 as the port

```
python3 ~/Downloads/Peer1.py client peer2 localhost 9037
```

```
SERVER 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer1 localhost 9036
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
[]

SERVER 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer3 localhost 9038
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51171)
New sender started for client - ('127.0.0.1', '51171', './peer3/sixtykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer3/sixtykb.txt
[]

CLIENT 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer1 localhost 9036
## Please input file name with extension. Or exit() to close.
twentykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]

SERVER 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer2 localhost 9037
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51152)
New sender started for client - ('127.0.0.1', '51152', './peer2/twentykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer2/twentykb.txt
[]

INDEX SERVER (Python)
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037', 'localhost|peer1|1035'}, '.DS_Store': {'localhost|peer3|9038', 'localhost|peer2|9037', 'localhost|peer1|9036'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer3|9038'}, 'fiftykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51170', 'sixtykb.txt', 'localhost|peer3|9038')
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51172', 'sixtykb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037', 'localhost|peer1|1035'}, '.DS_Store': {'localhost|peer3|9038', 'localhost|peer2|9037', 'localhost|peer1|9036'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer2|9037', 'localhost|peer3|9038'}, 'fiftykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
[]

CLIENT 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer2 localhost 9037
## Please input file name with extension. Or exit() to close.
sixtykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]

CLIENT 3 (bash)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer1 localhost 9038
```

## Before update

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51090', 'thirtykb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer1|9036'},
'tenkb.txt': {'localhost|peer1|9036'},
'twentykb.txt': {'localhost|peer2|9037'},
'thirtykb.txt': {'localhost|peer2|9037'}}
```

## Searching for sixtykb.txt and updated index

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51093', 'sixtykb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037'},
'tenkb.txt': {'localhost|peer1|9036'},
'twentykb.txt': {'localhost|peer2|9037'},
'thirtykb.txt': {'localhost|peer2|9037'},
'sixtykb.txt': {'localhost|peer3|9038'}}
```

## Step 5: - (Start third clients)

For client 3, we use peer3 as directory and 9038 as the port

```
python3 ~/Downloads/Peer1.py client peer13localhost 9038
```

```
SERVER 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer1 localhost 9036
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51180)
New sender started for client - ('127.0.0.1', '51180', './peer1/tenkb.txt')
## Successfully sent - ./peer1/tenkb.txt
Waiting patiently for new download requests
[]

SERVER 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer2 localhost 9037
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51152)
New sender started for client - ('127.0.0.1', '51152', './peer2/twentykb.txt')
## Successfully sent - ./peer2/twentykb.txt
[]

SERVER 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer3 localhost 9038
Server started. One time ops. Update all files to index server
Index server Update complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51171)
New sender started for client - ('127.0.0.1', '51171', './peer3/sixtykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer3/sixtykb.txt
[]

INDEX SERVER (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py index server localhost 9038
Updated index - ('127.0.0.1', '51181', 'tenkb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037'}, 'tenkb.txt': {'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer2|9037', 'localhost|peer3|9038'}, 'fiftykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51178', 'tenkb.py', 'notfound')
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51179', 'tenkb.txt', 'localhost|peer1|9036')
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51181', 'tenkb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037', 'localhost|peer1|9035'}, '.DS_Store': {'localhost|peer3|9038', 'localhost|peer2|9037', 'localhost|peer1|9036'}, 'tenkb.txt': {'localhost|peer3|9038', 'localhost|peer1|9036'}, 'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'}, 'thirtykb.txt': {'localhost|peer2|9037'}, 'sixtykb.txt': {'localhost|peer2|9037', 'localhost|peer3|9038'}, 'fiftykb.txt': {'localhost|peer3|9038'}}
Waiting patiently for search queries
[]

CLIENT 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer1 localhost 9036
## Please input file name with extension. Or exit() to close.
twentykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]

CLIENT 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer2 localhost 9037
## Please input file name with extension. Or exit() to close.
sixtykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]

CLIENT 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer3 localhost 9038
## Please input file name with extension. Or exit() to close.
tenkb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]
```

## Before update

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51172', 'sixtykb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037'},
'tenkb.txt': {'localhost|peer1|9036'},
'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'},
'thirtykb.txt': {'localhost|peer2|9037'},
'sixtykb.txt': {'localhost|peer2|9037', 'localhost|peer3|9038'},
'fiftykb.txt': {'localhost|peer3|9038'}}
```

## Searching for tenkb.txt and updated index

```
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51181', 'tenkb.txt')
{'onekb.txt': {'localhost|peer1|9036', 'localhost|peer2|9037'},
'tenkb.txt': {'localhost|peer3|9038', 'localhost|peer1|9036'},
'twentykb.txt': {'localhost|peer2|9037', 'localhost|peer1|9036'},
'thirtykb.txt': {'localhost|peer2|9037'},
'sixtykb.txt': {'localhost|peer2|9037', 'localhost|peer3|9038'},
'fiftykb.txt': {'localhost|peer3|9038'}}
```

## Step 6: - (If file is already existing)

If we search for file which already exists in the peer, then it will show error that the file already exists. For example, if we request for file onekb.txt in peer1, then it will show the following error in the image below

```
SERVER 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer1 localhost 9036
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51180)
New sender started for client - ('127.0.0.1', '51180', './peer1/tenkb.txt')
## Successfully sent - ./peer1/tenkb.txt
Waiting patiently for new download requests
[]

SERVER 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer2 localhost 9037
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51152)
New sender started for client - ('127.0.0.1', '51152', './peer2/twentykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer2/twentykb.txt
[]

SERVER 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer3 localhost 9038
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51171)
New sender started for client - ('127.0.0.1', '51171', './peer3/sixtykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer3/sixtykb.txt
[]

INDEX SERVER (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py index server localhost 9036
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51178', 'tenkb.py', 'notfound')
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51179', 'tenkb.txt', 'localhost:peer1:9036')
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51181', 'tenkb.txt')
{'onekb.txt': {'localhost:peer1:9036', 'localhost:peer2:9037', 'localhost:peer3:9038'}, '.DS_Store': {'localhost:peer3:9038', 'localhost:peer2:9037', 'localhost:peer1:9036'}, 'tenkb.txt': {'localhost:peer3:9038', 'localhost:peer1:9036'}, 'twentykb.txt': {'localhost:peer2:9037', 'localhost:peer1:9036'}, 'thirtykb.txt': {'localhost:peer2:9037', 'localhost:peer3:9038'}, 'sixtykb.txt': {'localhost:peer2:9037', 'localhost:peer3:9038'}, 'fiftykb.txt': {'localhost:peer3:9038'}}
Waiting patiently for search queries
[]

CLIENT 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer1 localhost 9036
twentykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
onekb.txt
onekb.txt Already exists for this peer. No need to download from remote
## Please input file name with extension. Or exit() to close.
[]

CLIENT 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer2 localhost 9037
## Please input file name with extension. Or exit() to close.
sixtykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]

CLIENT 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer3 localhost 9038
## Please input file name with extension. Or exit() to close.
tenkb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]
```

## Step 7: - (If file not found)

If the file is found nowhere then it will show sorry file cannot be found in any peer. For example, if we search fortykb.txt in the peer 2, it will show the following message as shown in the image below.

```
SERVER 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer1 localhost 9036
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51180)
New sender started for client - ('127.0.0.1', '51180', './peer1/tenkb.txt')
## Successfully sent - ./peer1/tenkb.txt
Waiting patiently for new download requests
[]

SERVER 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer2 localhost 9037
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51152)
New sender started for client - ('127.0.0.1', '51152', './peer2/twentykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer2/twentykb.txt
[]

SERVER 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py server peer3 localhost 9038
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for new download requests
Received file request from ('127.0.0.1', 51171)
New sender started for client - ('127.0.0.1', '51171', './peer3/sixtykb.txt')
Waiting patiently for new download requests
## Successfully sent - ./peer3/sixtykb.txt
[]

INDEX SERVER (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py index server localhost 9036
Server started. One time ops. Update all files to index server
Index server Updation complete
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51178', 'tenkb.py', 'notfound')
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51179', 'tenkb.txt', 'localhost:peer1:9036')
Waiting patiently for search queries
Updated index - ('127.0.0.1', '51181', 'tenkb.txt')
{'onekb.txt': {'localhost:peer1:9036', 'localhost:peer2:9037', 'localhost:peer3:9038'}, '.DS_Store': {'localhost:peer3:9038', 'localhost:peer2:9037', 'localhost:peer1:9036'}, 'tenkb.txt': {'localhost:peer3:9038', 'localhost:peer2:9037', 'localhost:peer1:9036'}, 'twentykb.txt': {'localhost:peer2:9037', 'localhost:peer1:9036'}, 'thirtykb.txt': {'localhost:peer2:9037', 'localhost:peer3:9038'}, 'sixtykb.txt': {'localhost:peer2:9037', 'localhost:peer3:9038'}, 'fiftykb.txt': {'localhost:peer3:9038'}}
Waiting patiently for search queries
Sent search result to - ('127.0.0.1', '51206', 'fourtykb.txt', 'notfound')
Waiting patiently for search queries
[]

CLIENT 1 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer1 localhost 9036
twentykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
onekb.txt
onekb.txt Already exists for this peer. No need to download from remote
## Please input file name with extension. Or exit() to close.
[]

CLIENT 2 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer2 localhost 9037
## Please input file name with extension. Or exit() to close.
sixtykb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
fourtykb.txt
Sorry file can not be found in any of the peer
## Please input file name with extension. Or exit() to close.
[]

CLIENT 3 (Python)
Vishants-MacBook-Pro:Downloads vishantbhole$ python3 ~/Downloads/Peer1.py client peer3 localhost 9038
## Please input file name with extension. Or exit() to close.
tenkb.txt
receiving data...
receiving data...
Successfully received entire file
Client closed connection. Now updating index server
## Please input file name with extension. Or exit() to close.
[]
```