

## P2P File Sharing - Super-peers - Manual

### Note

This manual only covers how to use the program. Terms that will be not explained in this manual are **ip address**, **ports**, **port forwarding**, **directories**, and **file hashes**. If this program is only needed to run locally, the *Simple* examples should work just fine. However, this manual is also mainly for Windows, meaning, the exact syntax of some commands may depend on your system.

### Procedure

The typical procedure for using this program is as follows

1. Create valid folders for each client
2. Move files to folders for each client that want to be shared
3. Create the static connection config (or use the one provided)
4. Start at least two clients, using the folders previously created, and where at least one of the clients is a super-peer
5. On one client, search for file
6. Request file, given the file hash (The long string of characters) from searching
7. Wait for file download or repeat steps 5-6
8. Close all clients

### Program arguments

A <int> just means it should be a number.

### Client

Usage:

Client [-ah] [-version] [-c <filePath>] [-f <directory>] [-i <int>]

Where:

-i <int>, -identity <int> Unique ID identifying this client

-c <filePath>, -configFile <filePath> The config file to use

-f <directory>, -downloadFolder <directory> The local folder files should be uploaded and downloaded to

-a, -all2all enable all2all mode

### Example

#### *Simple - Local Only*

```
.\Client.exe -i 0 -c "test_config.json" -f "watchFolder"
```

## Using the Interactive Console

The main interface with this program involves using the terminal of your device when using the client.

The following options are allowed when using the client.

- **ping**
  - Ping a client's superpeer's indexing server to check it's response time
- **list**
  - List all the files available on the network, meaning, show all the files we can either download or already have
- **search [query]**
  - Search for the query as a substring the in the name of all the files on the network, meaning, search for a file where **query** is what you want to look for
  - Example: **search am**
    - \* Search for files with an **am** in it's name
- **request [hash]**
  - Request a specific file, given the hash, meaning, copy the **hash** (The long string of characters) from a single file when you did either a **search** or **list** and paste it where **hash** is.
  - Example: **request E2D0FE1585A63EC6009C8016FF8DDA8B17719A637405A4E23C0FF81339148249**
- **q or quit or exit**
  - Stop the interactive console, this will close the client

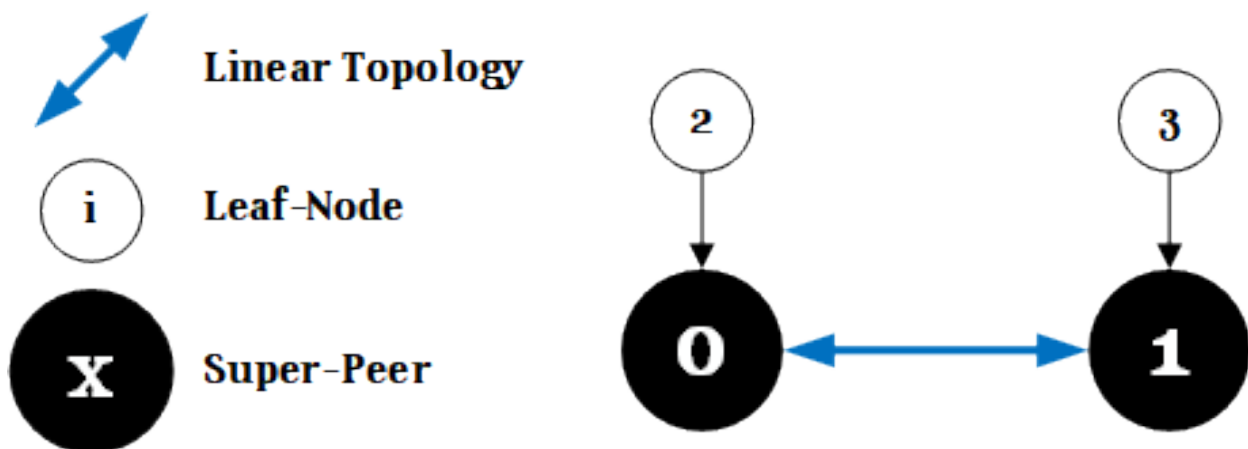
Remember, to add or remove files for sharing. Simply delete or add them to your folder that you initially created for the client.

## Overall Example

This example will demonstrate following the procedures for a *simple* local case.

### Topology

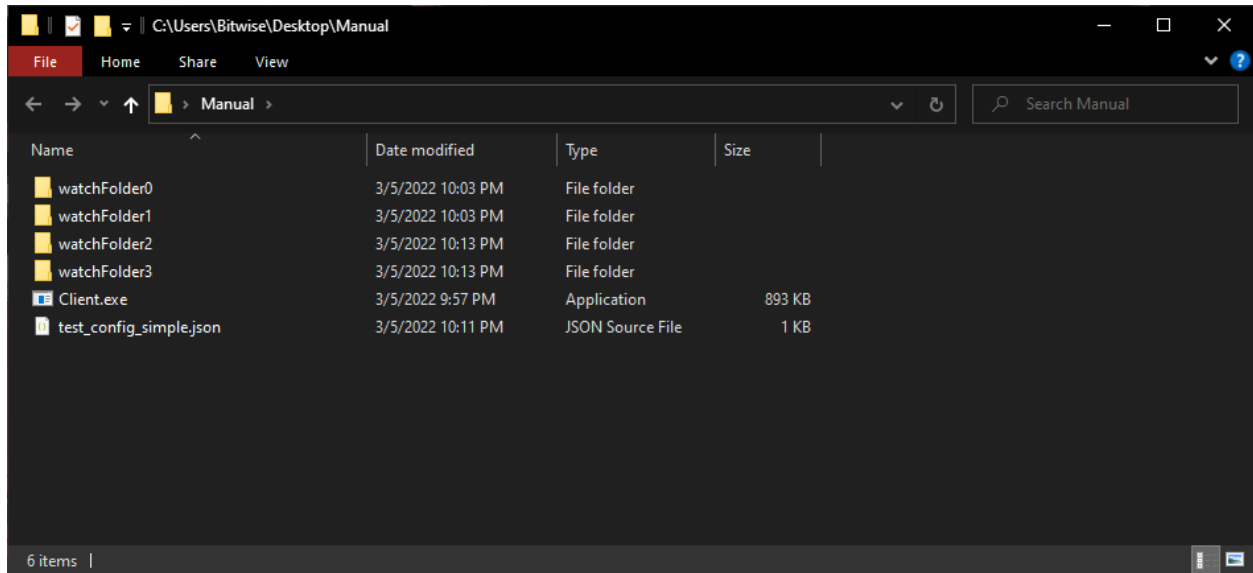
Because this is a simple example, it will only use two super-peers and two leaf-nodes, layed out as such



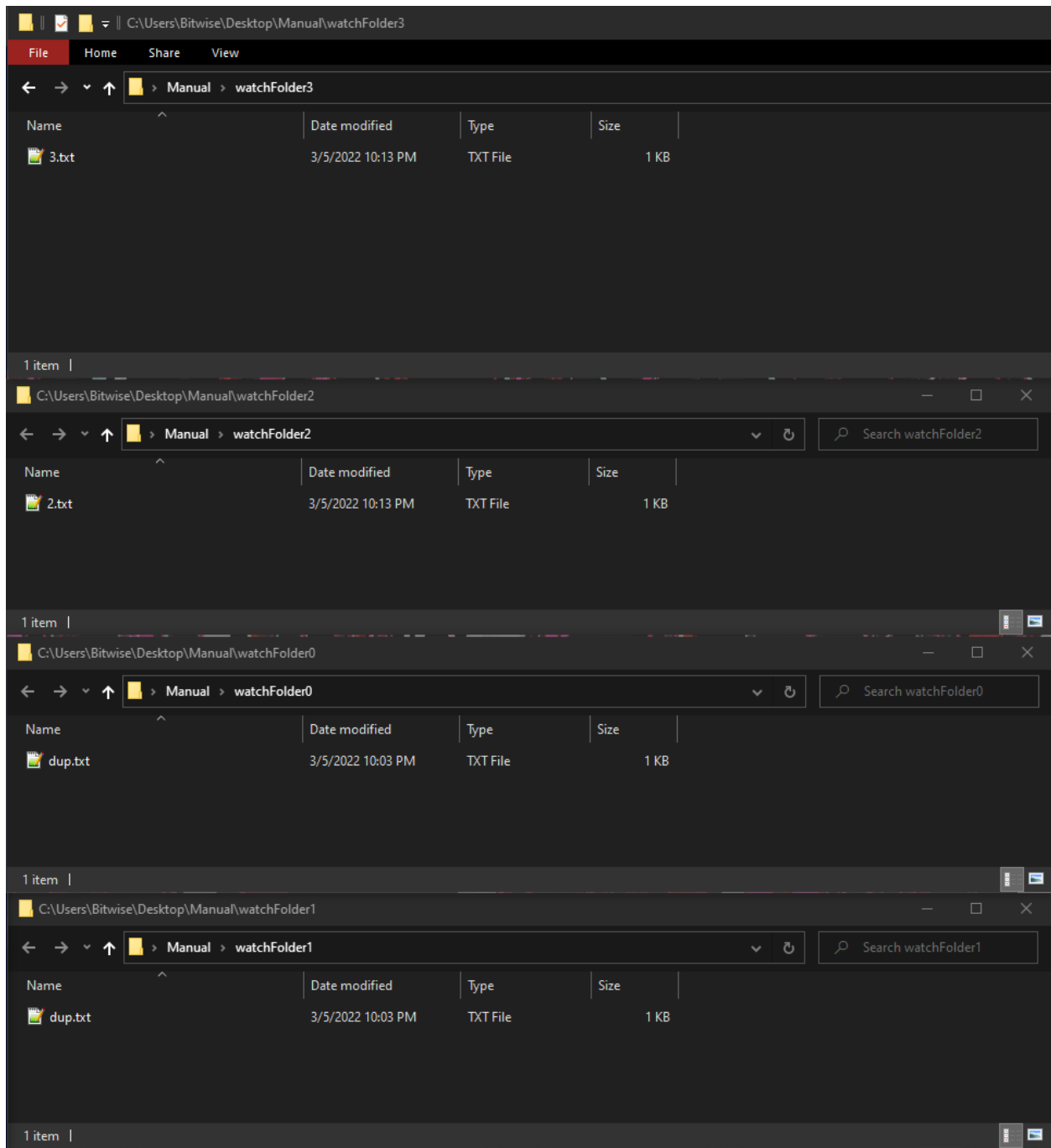
The config file for this is included.

## Initial setup

Here we can see where the directories are, relative to the client program.



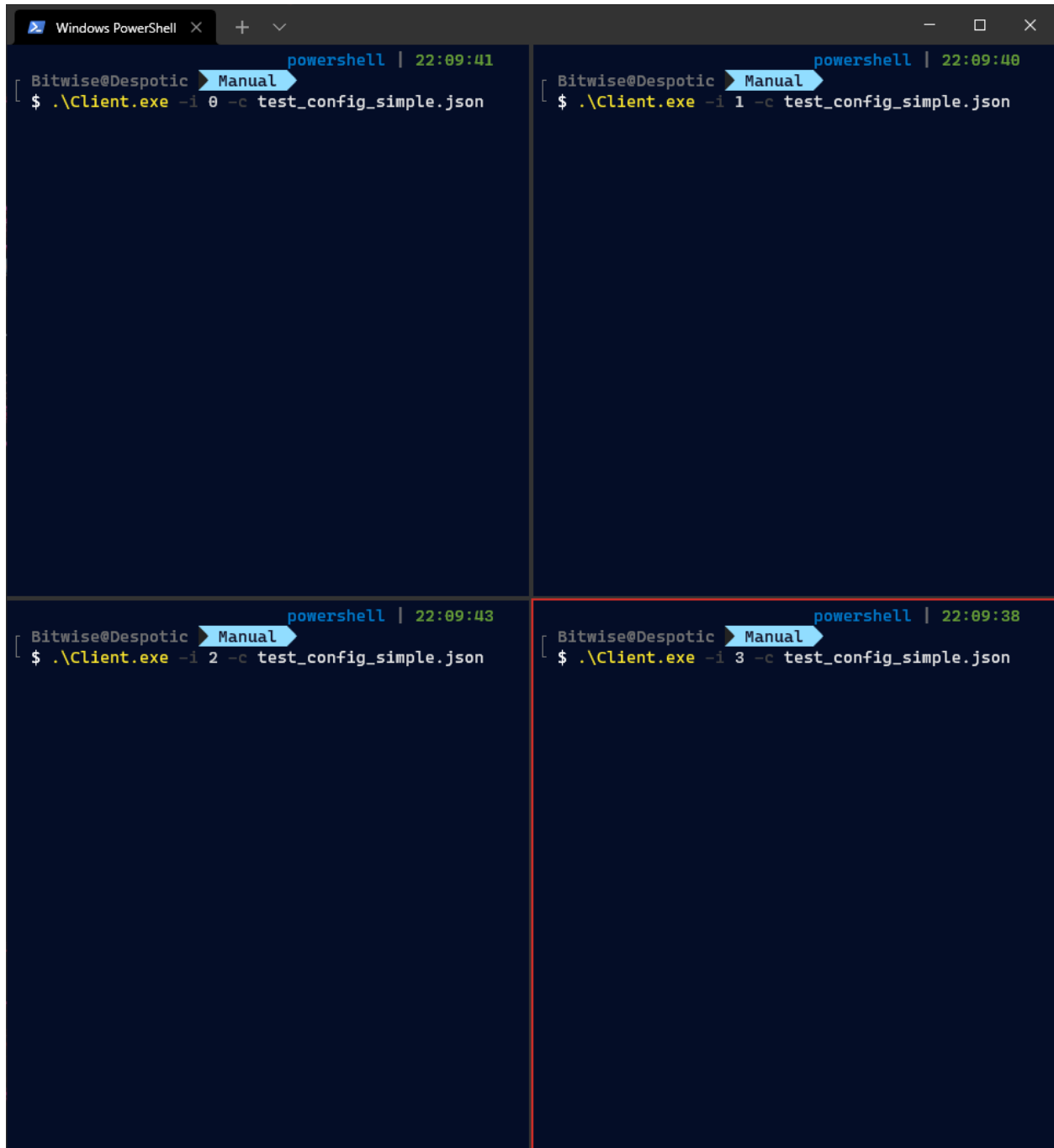
And here we can see the files in each directory



And just as a tip, you can shift right click on Windows in the same directory as the program to more easily open a terminal.

## Start Programs

Here we can see the commands are setup to be run.



The image displays four separate Windows PowerShell terminal windows arranged in a 2x2 grid. Each window has a title bar that says 'Windows PowerShell' and a tab labeled 'Manual'. The prompt in each window is 'Bitwise@Despotic'. The commands being executed are as follows:

- Top-left window (timestamp 22:09:41): `$.Client.exe -i 0 -c test_config_simple.json`
- Top-right window (timestamp 22:09:40): `$.Client.exe -i 1 -c test_config_simple.json`
- Bottom-left window (timestamp 22:09:43): `$.Client.exe -i 2 -c test_config_simple.json`
- Bottom-right window (timestamp 22:09:38): `$.Client.exe -i 3 -c test_config_simple.json`

`$.Client.exe -i 0 -c test_config_simple.json` start super-peer with id 0  
`$.Client.exe -i 1 -c test_config_simple.json` start super-peer with id 1  
`$.Client.exe -i 2 -c test_config_simple.json` start leaf-node with id 2  
`$.Client.exe -i 3 -c test_config_simple.json` start leaf-node with id 3

**NOTE:** if no argument is given for the watchfolder it defaults to watchfolderID where ID is the id of the client.

```
Windows PowerShell X + - □ X
[ Bitwise@Despotic Manual
$ .\Client.exe -i 0 -c test_config_simple.json
[Indexer] INFO : Running Server
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.107000ms
[Exchanger] DEBUG : Listening to port: 48900
[Console] : Console start!
[FileClient-0 > ] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Registry] : New
ID: 0
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Peer] INFO : Registered hash: dup.txt
[Registry] : New
ID: 2
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DE
DCBBABEE7C13BE2E02B0CAEF5A6D

Client-0 >

powershell | 22:09:43
[ Bitwise@Despotic Manual
$ .\Client.exe -i 2 -c test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.079000ms
[Exchanger] DEBUG : Listening to port: 48902
[Console] : Console start!
[File] Client-2 > DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Peer] INFO : Registered hash: 2.txt

Client-2 >

powershell | 22:09:38
[ Bitwise@Despotic Manual
$ .\Client.exe -i 1 -c test_config_simple.json
[Indexer] INFO : Running Server
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47901
[Indexer] INFO : Server pinged! 0.081000ms
[Exchanger] DEBUG : Listening to port: 48901
[Console] : Console start!
[FileClient-1 > ] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Registry] : New
ID: 1
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Peer] INFO : Registered hash: dup.txt
[Registry] : New
ID: 3
name: 3.txt
hash: 76BD6080BE28BDF33FA030A29A6D65849C26
84F2F93DC3A41D3668801DF29FB1

Client-1 >

powershell | 22:09:38
[ Bitwise@Despotic Manual
$ .\Client.exe -i 3 -c test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47901
[Indexer] INFO : Server pinged! 0.080000ms
[Exchanger] DEBUG : Listening to port: 48903
[Console] : Console start!
[Client-3File] DEBUG : > Hashing file: 3.txt
[Folder] DEBUG : File created: 3.txt
[Peer] INFO : Registered hash: 3.txt

Client-3 >
```

After running them all, you might notice the prompt Client-x > becomes a bit garbled, simply pressing enter once should fix it. Also, take note that the x is the id of the client.

## Listing all files

Here we are listing all the available files from client 3

We run the command `list`

```
Windows PowerShell X + - □ X

[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.107000ms
[Exchanger] DEBUG : Listening to port: 48900
[Console] : Console start!
[FileClient-0 > ] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Registry] : New
ID: 0
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Peer] INFO : Registered hash: dup.txt
[Registry] : New
ID: 2
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DE
DCBBABEE7C13BE2E02B0CAEF5A6D

Client-0 > [Indexer] DEBUG : Request Listing 1
[List] : Listing all files entries
[Indexer] DEBUG : TTL finished 797849837586022540
[Indexer] DEBUG : Returning results

powerShell | 22:09:43
Bitwise@Despotic Manual
$ .\Client.exe -i 2 -c test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.079000ms
[Exchanger] DEBUG : Listening to port: 48902
[Console] : Console start!
[File] Client-2 > DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Peer] INFO : Registered hash: 2.txt

Client-2 >

127.0.0.1:47901
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47901
[Indexer] INFO : Server pinged! 0.081000ms
[Exchanger] DEBUG : Listening to port: 48901
[Console] : Console start!
[FileClient-1 > ] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Registry] : New
ID: 1
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Peer] INFO : Registered hash: dup.txt
[Registry] : New
ID: 3
name: 3.txt
hash: 76BD6080BE28BDF33FA030A29A6D65849C26
84F2F93DC3A41D3668801DF29FB1

Client-1 > [Indexer] DEBUG : Request Listing -1
[List] : Listing all files entries
[Indexer] DEBUG : Propagating query list 79784983
7586022540 1
[Indexer] DEBUG : Returning results

127.0.0.1:47901
[Indexer] INFO : Server pinged! 0.080000ms
[Exchanger] DEBUG : Listening to port: 48903
[Console] : Console start!
[Client-3File] DEBUG : > Hashing file: 3.txt
[Folder] DEBUG : File created: 3.txt
[Peer] INFO : Registered hash: 3.txt

Client-3 > list
[indexRPCParse] INFO : Listing server file index
Hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE
7C13BE2E02B0CAEF5A6D
Added on 05/03/2022 22:14:43
Name: 2.txt
Peers: 1
Hash: 395A71419DADACF6653548C449A207536831AF86ECF2
65E2067E0377A14A447F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 2
Hash: 76BD6080BE28BDF33FA030A29A6D65849C2684F2F93D
C3A41D3668801DF29FB1
Added on 05/03/2022 22:14:44
Name: 3.txt
Peers: 1
Client-3 >
```

Take notice of the Hash associated with each file listed, this is what we use to request a file to download

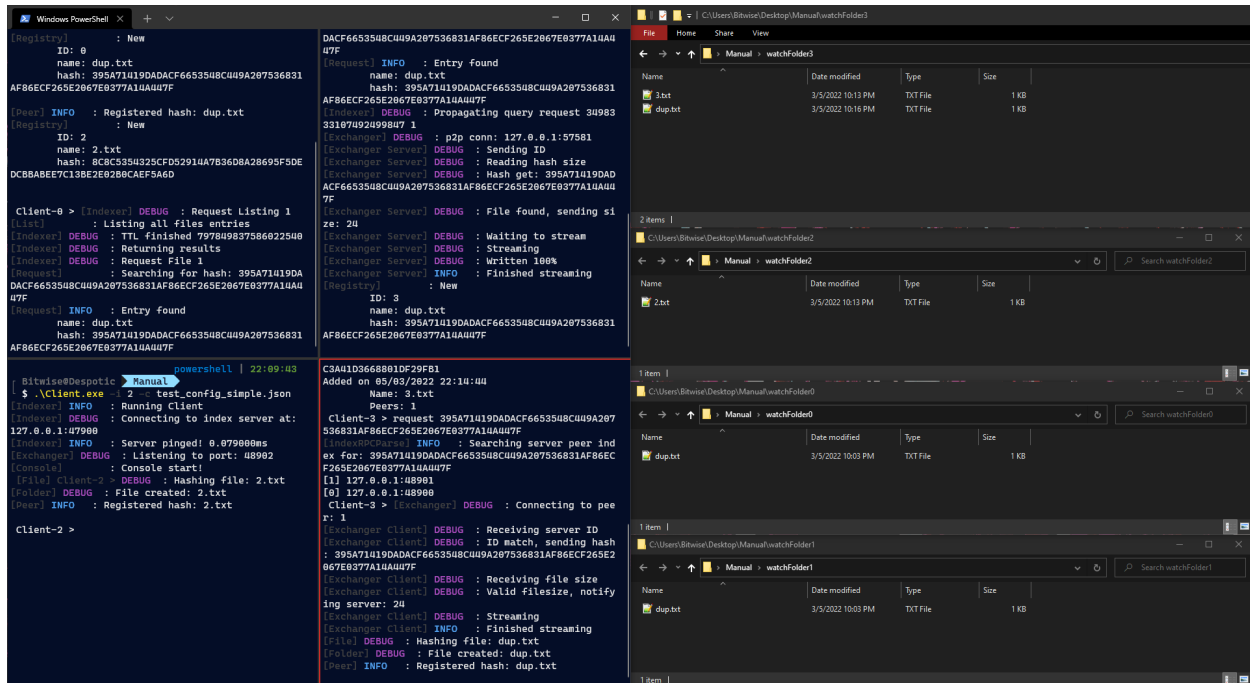
Lets focus on the file `dup.txt` which has the hash of `395A71419DADACF6653548C449A207536831AF86ECF265E2067E0377A14A447F`

## Requesting a file

Now we need to actually request this file by running the following command from client 3

We run the command `request 395A71419DADACF6653548C449A207536831AF86ECF265E2067E0377A14A447F`

After this runs, we can now see that the file is in the watchfolder for client 3.





## Search for a file

Here we can now see, after searching for `dup` from client 3, that there are now three peers which have the same file.

We run the command `search dup`

```
Windows PowerShell X + - □ X

hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Peer] INFO : Registered hash: dup.txt
[Registry] : New
ID: 2
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DE
DCBBABEE7C13BE2E02B0CAEF5A6D

Client-0 > [Indexer] DEBUG : Request Listing 1
[List] : Listing all files entries
[Indexer] DEBUG : TTL finished 797849837586022540
[Indexer] DEBUG : Returning results
[Indexer] DEBUG : Request File 1
[Request] : Searching for hash: 395A71419DA
DACF6653548C449A207536831AF86ECF265E2067E0377A14A4
47F
[Request] INFO : Entry found
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F
[Indexer] DEBUG : Request Search 1
[Search] : Searching for query: dup

AF86ECF265E2067E0377A14A447F
[Indexer] DEBUG : Propagating query request 34983
33107492499847 1
[Exchanger] DEBUG : p2p conn: 127.0.0.1:57581
[Exchanger Server] DEBUG : Sending ID
[Exchanger Server] DEBUG : Reading hash size
[Exchanger Server] DEBUG : Hash get: 395A71419DAD
ACF6653548C449A207536831AF86ECF265E2067E0377A14A44
7F
[Exchanger Server] DEBUG : File found, sending si
ze: 24
[Exchanger Server] DEBUG : Waiting to stream
[Exchanger Server] DEBUG : Streaming
[Exchanger Server] DEBUG : Written 100%
[Exchanger Server] INFO : Finished streaming
[Registry] : New
ID: 3
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F
[Indexer] DEBUG : Request Search -1
[Search] : Searching for query: dup
[Indexer] DEBUG : Propagating query search 144121
14876339529566 1

powershell | 22:09:43
[ Bitwise@Despotic Manual
$ .\Client.exe -i 2 -c test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.079000ms
[Exchanger] DEBUG : Listening to port: 48902
[Console] : Console start!
[File] Client-2 > DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Peer] INFO : Registered hash: 2.txt

Client-2 >

[1] 127.0.0.1:48901
[0] 127.0.0.1:48900
Client-3 > [Exchanger] DEBUG : Connecting to pee
r: 1
[Exchanger Client] DEBUG : Receiving server ID
[Exchanger Client] DEBUG : ID match, sending hash
: 395A71419DADACF6653548C449A207536831AF86ECF265E2
067E0377A14A447F
[Exchanger Client] DEBUG : Receiving file size
[Exchanger Client] DEBUG : Valid filesize, notify
ing server: 24
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Peer] INFO : Registered hash: dup.txt

Client-3 > search dup
[indexRPCParse] INFO : Searching server file ind
ex for: dup
Hash: 395A71419DADACF6653548C449A207536831AF86ECF2
65E2067E0377A14A447F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 3
Client-3 >
```

## Super-peer listing all files

Here we can see super-peer 0 listing all the available files

We run the command `list`

```
Windows PowerShell X + - □ X

[Indexer] DEBUG : Request Search 1
[Search]       : Searching for query: dup

Client-0 > list
[indexRPCParse] INFO : Listing server file index
[Indexer] DEBUG : Request Listing -1
[List]         : Listing all files entries
[Indexer] DEBUG : Propagating query list 77214877
75885090099 1
[Indexer] DEBUG : Returning results
Hash: 76BD6080BE28BDF33FA030A29A6D65849C2684F2F93D
C3A41D3668801DF29FB1
Added on 05/03/2022 22:14:44
Name: 3.txt
Peers: 1
Hash: 395A71419DADACF6653548C449A207536831AF86ECF2
65E2067E0377A14A447F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 3
Hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE
7C13BE2E02B0CAEF5A6D
Added on 05/03/2022 22:14:43
Name: 2.txt
Peers: 1
Client-0 >

[Exchanger Server] DEBUG : Sending ID
[Exchanger Server] DEBUG : Reading hash size
[Exchanger Server] DEBUG : Hash get: 395A71419DAD
ACF6653548C449A207536831AF86ECF265E2067E0377A14A44
7F
[Exchanger Server] DEBUG : File found, sending si
ze: 24
[Exchanger Server] DEBUG : Waiting to stream
[Exchanger Server] DEBUG : Streaming
[Exchanger Server] DEBUG : Written 100%
[Exchanger Server] INFO : Finished streaming
[Registry]       : New
ID: 3
name: dup.txt
hash: 395A71419DADACF6653548C449A207536831
AF86ECF265E2067E0377A14A447F

[Indexer] DEBUG : Request Search -1
[Search]       : Searching for query: dup
[Indexer] DEBUG : Propagating query search 144121
14876339529566 1
[Indexer] DEBUG : Request Listing 1
[List]         : Listing all files entries
[Indexer] DEBUG : TTL finished 772148777588509009
9
[Indexer] DEBUG : Returning results

powershell | 22:09:43
Bitwise@Despotic Manual
$ .\Client.exe -i 2 -c test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at:
127.0.0.1:47900
[Indexer] INFO : Server pinged! 0.079000ms
[Exchanger] DEBUG : Listening to port: 48902
[Console]       : Console start!
[File] Client-2 > DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Peer] INFO : Registered hash: 2.txt

Client-2 >

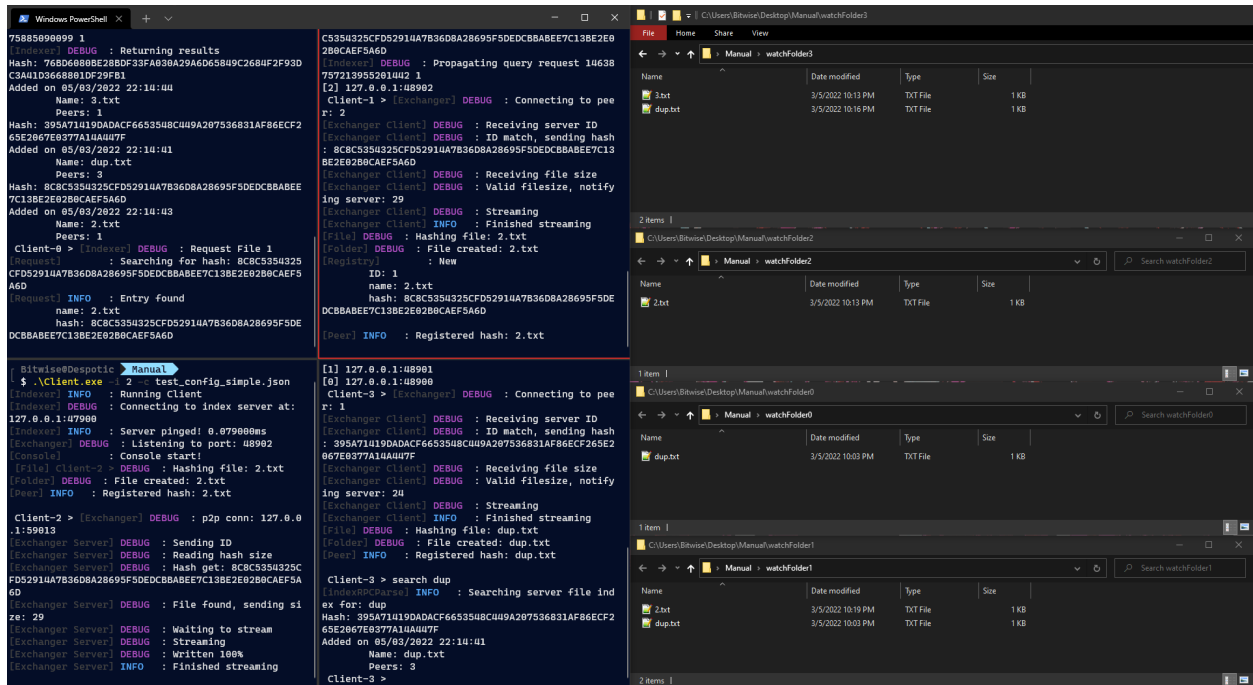
[1] 127.0.0.1:48901
[0] 127.0.0.1:48900
Client-3 > [Exchanger] DEBUG : Connecting to pee
r: 1
[Exchanger Client] DEBUG : Receiving server ID
[Exchanger Client] DEBUG : ID match, sending hash
: 395A71419DADACF6653548C449A207536831AF86ECF265E2
067E0377A14A447F
[Exchanger Client] DEBUG : Receiving file size
[Exchanger Client] DEBUG : Valid filesize, notify
ing server: 24
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Peer] INFO : Registered hash: dup.txt

Client-3 > search dup
[indexRPCParse] INFO : Searching server file ind
ex for: dup
Hash: 395A71419DADACF6653548C449A207536831AF86ECF2
65E2067E0377A14A447F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 3
Client-3 >
```

## Super-peer requesting a file

Here we can see super-peer 1 request the file 2.txt using it's appropriate hash

We run the command `request 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D`



```
75885989899 1
[Debugger] DEBUG : Returning results
Hash: 76806888E28DF33FA80A29A6D65849C2684F2F93D
C3A01D36688010F29F81
Added on 05/03/2022 22:10:00
Peers: 1
Name: 3.txt
[Debugger] DEBUG : Propagating query request 14638
757213955201442 1
[2] 127.0.0.1:48902
Client-1 > [Exchanger] DEBUG : Connecting to peer: 2
[Exchanger Client] DEBUG : Receiving server ID
[Exchanger Client] DEBUG : ID match, sending hash
Hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
[Exchanger Client] DEBUG : Receiving file size
[Exchanger Client] DEBUG : Valid filesize, notifying server: 29
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Registry] : New
ID: 1
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
[Peer] INFO : Registered hash: 2.txt

[BitwiseDespotic] Manual
$ .\Client.exe -i 2 -t test_config_simple.json
[Indexer] INFO : Running Client
[Indexer] DEBUG : Connecting to index server at: 127.0.0.1:47990
[Indexer] INFO : Server pinged: 0.079000ms
[Indexer] DEBUG : Listening to port: 48902
[Console] : Console start!
[File] Client-2 > DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Peer] INFO : Registered hash: 2.txt

Client-2 > [Exchanger] DEBUG : p2p conn: 127.0.0.1:59013
[Exchanger Server] DEBUG : Sending ID
[Exchanger Server] DEBUG : Reading hash size
[Exchanger Server] DEBUG : Hash get: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
[Exchanger Server] DEBUG : File found, sending size: 29
[Exchanger Server] DEBUG : Waiting to stream
[Exchanger Server] DEBUG : Streaming
[Exchanger Server] DEBUG : Written 100%
[Exchanger Server] INFO : Finished streaming

[1] 127.0.0.1:48901
[0] 127.0.0.1:48900
Client-3 > [Exchanger] DEBUG : Connecting to peer: 1
[Exchanger Client] DEBUG : Receiving server ID
[Exchanger Client] DEBUG : ID match, sending hash
Hash: 395A71419DADACF6653548C49A207536831AF86ECF265E2867E0377A1A4447F
[Exchanger Client] DEBUG : Receiving file size
[Exchanger Client] DEBUG : Valid filesize, notifying server: 24
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Peer] INFO : Registered hash: dup.txt

Client-3 > search dup
[Exchanger Server] INFO : Searching server file index for: dup
Hash: 395A71419DADACF6653548C49A207536831AF86ECF265E2867E0377A1A4447F
Added on 05/03/2022 22:14:01
Name: dup.txt
Peers: 3
Client-3 >
```

After this runs, we can also now see that the file is in the watchfolder for client 1.

## Closing

We now can close all clients with q.

```
Windows PowerShell X + - □ X

Name: dup.txt
Peers: 3
Hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
Added on 05/03/2022 22:14:43
Name: 2.txt
Peers: 1
Client-0 > [Indexer] DEBUG : Request File 1
[Request] : Searching for hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
[Request] INFO : Entry found
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D

Client-0 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for changes
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
powershell | 22:38:12
[ Bitwise@Despotic Manual
$

[Peer] INFO : Registered hash: 2.txt

Client-2 > [Exchanger] DEBUG : p2p conn: 127.0.0.1:59013
[Exchanger Server] DEBUG : Sending ID
[Exchanger Server] DEBUG : Reading hash size
[Exchanger Server] DEBUG : Hash get: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D
[Exchanger Server] DEBUG : File found, sending size: 29
[Exchanger Server] DEBUG : Waiting to stream
[Exchanger Server] DEBUG : Streaming
[Exchanger Server] DEBUG : Written 100%
[Exchanger Server] INFO : Finished streaming

Client-2 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for changes
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
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BE2E02B0CAEF5A6D
[Exchanger Client] DEBUG : Receiving file size
[Exchanger Client] DEBUG : Valid filesize, notifying server: 29
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: 2.txt
[Folder] DEBUG : File created: 2.txt
[Registry] : New
ID: 1
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B0CAEF5A6D

[Peer] INFO : Registered hash: 2.txt

Client-1 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for changes
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
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[Exchanger Client] DEBUG : Valid filesize, notifying server: 24
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Peer] INFO : Registered hash: dup.txt

Client-3 > search dup
[indexRPCParse] INFO : Searching server file index for: dup
Hash: 395A71419DADACF6653548C449A207536831AF86ECF265E2067E0377A14A447F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 3

Client-3 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for changes
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
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```

Here, everything has now closed and we are done.

The screenshot displays a Windows PowerShell console window with multiple tabs and three File Explorer windows. The PowerShell console shows a series of commands and debug messages related to a file sharing process. The File Explorer windows show the contents of three folders: 'Manual\watchFolder3', 'Manual\watchFolder2', and 'Manual\watchFolder0'. Each folder contains a file named 'dup.txt'.

```
Name: dup.txt
Peers: 3
Hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
Added on 05/03/2022 22:14:43
Name: 2.txt
Peers: 1
[Request] : [Indexer] DEBUG : Request File 1
[Request] : Searching for hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[Request] INFO : Entry found
name: 2.txt
hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
DCBBABEE7C13BE2E02B8CAEF5A6D
Client-0 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for change s
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
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[Peer] INFO : Registered hash: 2.txt
Client-2 > [Exchanger] DEBUG : p2p conn: 127.0.0.1:59013
[Exchanger Server] DEBUG : Sending ID
[Exchanger Server] DEBUG : Reading hash size
[Exchanger Server] DEBUG : Hash get: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[Exchanger Server] DEBUG : File found, sending size: 29
[Exchanger Server] DEBUG : Streaming
[Exchanger Server] DEBUG : Written 100%
[Exchanger Server] INFO : Finished streaming
Client-2 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for change s
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
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[Registry] : New
ID: 3
name: dup.txt
hash: 395A71419DADACF6653548C4A9A287536831AF86ECF265E2067E0377A14AAH7F
[Indexer] DEBUG : Request Search-1
[Search] : Searching for query: dup
[Indexer] DEBUG : Propagating query search 144121
14876339529566 1
[Indexer] DEBUG : Request Listing 1
[List] : Listing all files entries
[Indexer] DEBUG : TTL finished 772148777588509009 9
[Indexer] DEBUG : Returning results
Client-1 > request 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[IndexRPCParse] INFO : Searching server peer index for: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[Request] : Request File -1
[Request] : Searching for hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[Request] WARNING: No entries found with hash: 8C8C5354325CFD52914A7B36D8A28695F5DEDCBBABEE7C13BE2E02B8CAEF5A6D
[Exchanger Client] DEBUG : Valid filesize, notifying server: 29
[Exchanger Client] DEBUG : Streaming
[Exchanger Client] INFO : Finished streaming
[File] DEBUG : Hashing file: dup.txt
[Folder] DEBUG : File created: dup.txt
[Peer] INFO : Registered hash: dup.txt
Client-3 > search dup
[IndexRPCParse] INFO : Searching server file index for: dup
Hash: 395A71419DADACF6653548C4A9A287536831AF86ECF265E2067E0377A14AAH7F
Added on 05/03/2022 22:14:41
Name: dup.txt
Peers: 3
Client-3 > q
[Console] INFO : Exiting
[Folder] DEBUG : Stopped watching path for change s
[Exchanger] DEBUG : stopped receiving peer requests
[Indexer] INFO : Stopping Client
[BitwiseDespotic] powershell | 22:38:10
$
```

The File Explorer windows show the following contents:

- Manual\watchFolder3**: Contains files '3.txt' and 'dup.txt', both 1 KB, modified on 3/5/2022 10:13 PM and 3/5/2022 10:16 PM respectively.
- Manual\watchFolder2**: Contains file '2.txt', 1 KB, modified on 3/5/2022 10:13 PM.
- Manual\watchFolder0**: Contains file 'dup.txt', 1 KB, modified on 3/5/2022 10:03 PM.
- Manual\watchFolder1**: Contains files '3.txt' and 'dup.txt', both 1 KB, modified on 3/5/2022 10:19 PM and 3/5/2022 10:03 PM respectively.