

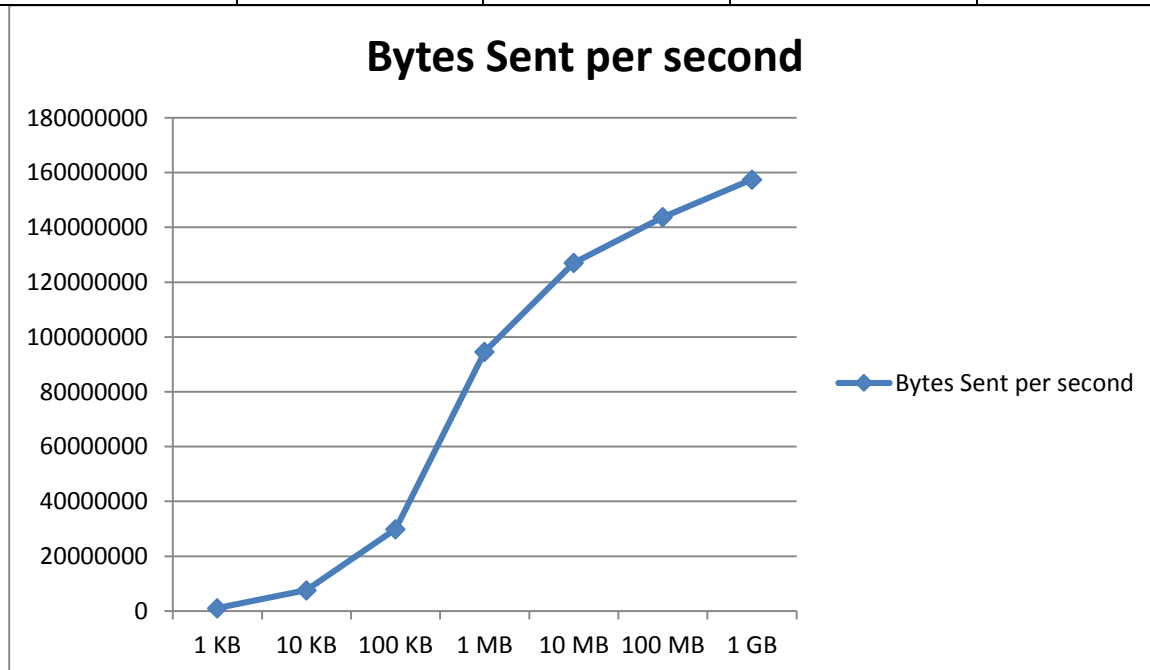
Evaluation part – II

Following is the result of evaluation performed on different file sizes.

8 Servers are running concurrently.

Files of different sizes getting transferred. Files sizes are 1KB, 10KB,100KB, 1MB, 10MB, 100MB and 1GB

File Size	Number Of Files	Total File Size	Time required(Seconds)	Number of bytes sent per second
1KB	10000*8	80 MB	77.319	1034674.5
10KB	1000*8	80 MB	10.520	7604562.7
100KB	1000*8	800 MB	26.762	29893132.0
1MB	100*8	800 MB	8.4532	94638716.6
10MB	100*8	8000 MB	62.969	127046641.9
100MB	10*8	8000 MB	55.636	143791789.4
1GB	1*8	8000 MB	50.798	157486515.21



Analysis of performance

As we can see from above graph that **1KB** files took **77.319 seconds** to transfer **80mb** of data at **1034674.5 bytes/ seconds** speed and **1 gb** file took **50.798** seconds to transfer **8 gb** of data at **157486515.21 bytes/ seconds** speed. This clearly shows that as we increase file sizes bytes send per second sent goes on increasing as less number of request it has to make. Less number of overhead of making socket connection and initiating a process / thread and also decreases file creation time.

Note:- I have done evaluation 2 on windows as I am facing issue on ubuntu. Laptop is getting heated and it is abruptly shutting down the system hence, I was not able to complete evaluation on ubuntu so used windows. This can can sucessfully run on linux as well as shown in output file.

1. 1KB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 10000 Files

Total Number of files system processing : 80000(8 * 10000)

Each file Size : 1 kb

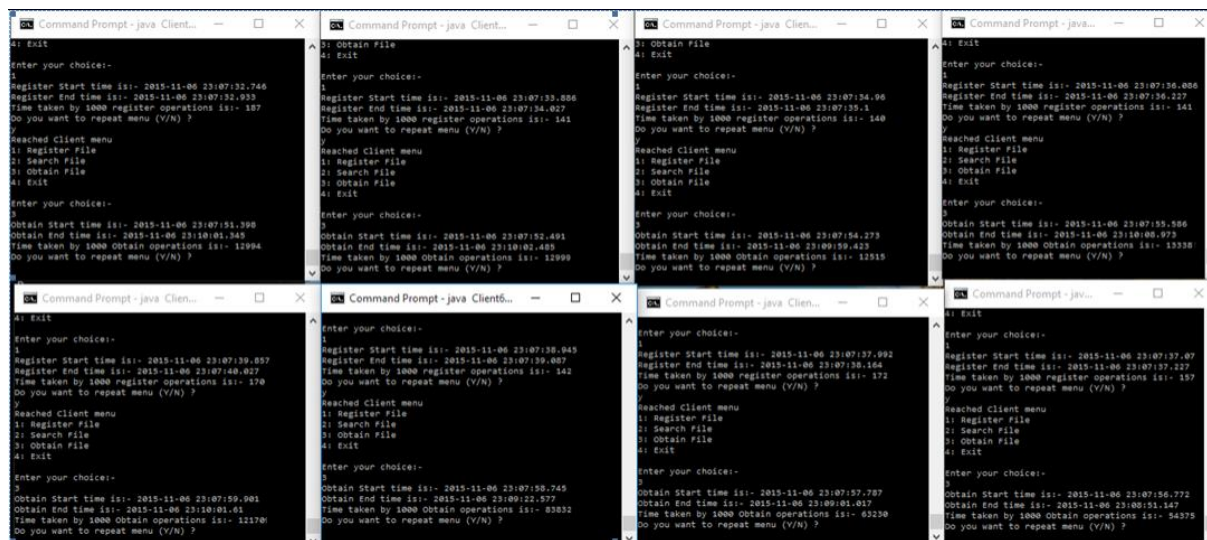
Time required for obtain operation :

$$\text{Bytes/Second sent} = (80,000 * 1000) / 77.319 = 1034674.5 \text{ bytes}$$

Files File_Size

```
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:29.66
Register End time is:- 2015-11-06 16:58:30.449
Time taken by 10K register operations is:- 789
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:58:39.083
Obtain End time is:- 2015-11-06 17:11:14.657
Time taken by 10K Obtain operations is:- 76959
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:31.371
Register End time is:- 2015-11-06 16:58:32.021
Time taken by 10K register operations is:- 650
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:00.5
Obtain End time is:- 2015-11-06 17:11:13.186
Time taken by 10K Obtain operations is:- 73268
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:33.801
Register End time is:- 2015-11-06 16:58:33.803
Time taken by 10K register operations is:- 782
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:03.28
Obtain End time is:- 2015-11-06 17:12:20.032
Time taken by 10K Obtain operations is:- 79675
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:34.646
Register End time is:- 2015-11-06 16:58:35.115
Time taken by 10K register operations is:- 469
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:03.28
Obtain End time is:- 2015-11-06 17:12:20.032
Time taken by 10K Obtain operations is:- 79675
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:36.478
Register End time is:- 2015-11-06 16:58:36.478
Time taken by 10K register operations is:- 672
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:05.759
Obtain End time is:- 2015-11-06 17:12:21.282
Time taken by 10K Obtain operations is:- 79532
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:37.478
Register End time is:- 2015-11-06 16:58:37.478
Time taken by 10K register operations is:- 672
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:05.759
Obtain End time is:- 2015-11-06 17:12:21.282
Time taken by 10K Obtain operations is:- 79532
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:38.401
Register End time is:- 2015-11-06 16:58:38.401
Time taken by 10K register operations is:- 680
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:06.082
Obtain End time is:- 2015-11-06 17:12:22.411
Time taken by 10K Obtain operations is:- 79512
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:39.049
Register End time is:- 2015-11-06 16:58:40.653
Time taken by 10K register operations is:- 704
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:06.262
Obtain End time is:- 2015-11-06 17:12:05.763
Time taken by 10K Obtain operations is:- 77750
Do you want to repeat menu (Y/N) ?
Y
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 16:58:40.653
Register End time is:- 2015-11-06 16:58:40.653
Time taken by 10K register operations is:- 594
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 16:59:06.603
Obtain End time is:- 2015-11-06 17:12:11.474
Time taken by 10K Obtain operations is:- 78687
Do you want to repeat menu (Y/N) ?
Y
```

Total Number of Peers Connected : 8
Files each server processing : 1000 Files
Total Number of files system processing : $8000(8 * 1000)$
Each file Size : 10 kb
Time required for obtain operation :

$$\text{Bytes/Second sent} = \frac{(\text{8000} * \text{10000})}{\text{10.520}} = \text{7604562.7 bytes}$$


3. 100 KB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 1000 Files

Total Number of files system processing : 8000(8 * 1000)

Each file Size : 100 kb

Time required for obtain operation :

Bytes/Second sent = $(8000 * 100000) / 26.762 = 29893132.0$ bytes

Files File_Size

```
Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:54.929
Register End time is:- 2015-11-06 22:41:55.297
Time taken by 1000 register operations is:- 328
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:12.445
Obtain End time is:- 2015-11-06 22:47:40.549
Time taken by 1000 Obtain operations is:- 33818
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:55.802
Register End time is:- 2015-11-06 22:41:56.07
Time taken by 1000 register operations is:- 188
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:14.148
Obtain End time is:- 2015-11-06 22:47:53.29
Time taken by 1000 Obtain operations is:- 33914
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:56.004
Register End time is:- 2015-11-06 22:41:57.007
Time taken by 1000 register operations is:- 203
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:15.197
Obtain End time is:- 2015-11-06 22:47:55.69
Time taken by 1000 Obtain operations is:- 33845
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:57.873
Register End time is:- 2015-11-06 22:41:58.092
Time taken by 1000 register operations is:- 219
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:16.367
Obtain End time is:- 2015-11-06 22:47:55.072
Time taken by 1000 Obtain operations is:- 33878
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:42:00.139
Register End time is:- 2015-11-06 22:42:00.542
Time taken by 1000 register operations is:- 203
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:20.065
Obtain End time is:- 2015-11-06 22:47:52.518
Time taken by 1000 Obtain operations is:- 33245
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:42:00.326
Register End time is:- 2015-11-06 22:42:00.529
Time taken by 1000 register operations is:- 203
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:18.985
Obtain End time is:- 2015-11-06 22:47:08.609
Time taken by 1000 Obtain operations is:- 28962
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:59.529
Register End time is:- 2015-11-06 22:41:59.717
Time taken by 1000 register operations is:- 188
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:18.166
Obtain End time is:- 2015-11-06 22:43:42.309
Time taken by 1000 Obtain operations is:- 84143
Do you want to repeat menu (Y/N) ?
Y

Command Prompt - java Client...
4: Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 22:41:58.717
Register End time is:- 2015-11-06 22:41:58.904
Time taken by 1000 register operations is:- 187
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 22:42:17.272
Obtain End time is:- 2015-11-06 22:43:39.684
Time taken by 1000 Obtain operations is:- 82412
Do you want to repeat menu (Y/N) ?
Y
```

4. 1 MB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 100 Files

Total Number of files system processing : 800 (8 * 100)

Each file Size : 1 mb

Time required for obtain operation :

Bytes/Second sent = $(800 * 1000000) / 8.4532 = 94638716.6$ bytes

Files File_Size

The image displays eight separate Command Prompt windows, each running a Java Client application. The windows are arranged in two rows of four. Each window shows the following sequence of events:

- Initial Menu:** A menu with options: 1: Register File, 2: Search File, 3: Obtain File, 4: Exit.
- User Choice:** The user enters a choice (1, 2, or 3).
- Operation Execution:** The application performs the selected operation (Register, Search, or Obtain).
- Performance Metrics:** The application displays the start and end times for the operation, the time taken by 100 operations, and a prompt to repeat the menu (Y/N).
- Reached Client menu:** After the operation, the user is prompted to reach the client menu.
- Final Menu:** The application returns to the initial menu for the next operation.

Each window shows different timestamps and performance metrics, indicating multiple runs of the application. For example, the first window shows a 'Register' operation starting at 2015-11-06 22:08:14.182 and ending at 2015-11-06 22:08:14.275, taking 93 units of time for 100 operations.

5. 10 MB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 100 Files

Total Number of files system processing : 800 (8 * 100)

Each file Size : 10 mb

Time required for obtain operation :

Bytes/Second sent = $(800 * 10000000) / 62.969 = 127046641.9$ bytes

Files File_Size

The image displays eight screenshots of a Java Client application running in Windows Command Prompt windows. Each window shows the 'Obtain File' process for 100 files. The output for each window includes the following information:

- Register Start time
- Register End time
- Time taken by 100 register operations
- Reached Client menu
- Obtain Start time
- Obtain End time
- Time taken by 100 Obtain operations

The screenshots show the application running on a system with the path `C:\Users\SUDAV\Desktop\1MB\Clientes`. The output for each window is as follows:

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:36.461
Register End time is:- 2015-11-06 21:07:36.506
Time taken by 100 register operations is:- 125
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:07:35.713
Obtain End time is:- 2015-11-06 21:18:21.278
Time taken by 100 Obtain operations is:- 61356
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:37.43
Register End time is:- 2015-11-06 21:07:37.477
Time taken by 100 register operations is:- 47
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:07:36.713
Obtain End time is:- 2015-11-06 21:18:21.046
Time taken by 100 Obtain operations is:- 63523
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:39.006
Register End time is:- 2015-11-06 21:07:39.165
Time taken by 100 register operations is:- 79
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:07:37.757
Obtain End time is:- 2015-11-06 21:18:43.828
Time taken by 100 Obtain operations is:- 66607
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:40.165
Register End time is:- 2015-11-06 21:07:40.227
Time taken by 100 register operations is:- 62
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:07:38.71
Obtain End time is:- 2015-11-06 21:18:38.509
Time taken by 100 Obtain operations is:- 6379
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:42.685
Register End time is:- 2015-11-06 21:07:42.712
Time taken by 100 register operations is:- 47
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:08:01.1
Obtain End time is:- 2015-11-06 21:18:29.524
Time taken by 100 Obtain operations is:- 62842
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:41.837
Register End time is:- 2015-11-06 21:07:41.899
Time taken by 100 register operations is:- 62
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:08:00.304
Obtain End time is:- 2015-11-06 21:18:20.15
Time taken by 100 Obtain operations is:- 62787
Do you want to repeat menu (Y/N) ?
Y
```

```
1. Obtain File
2. Exit
Enter your choice:-
1
Register Start time is:- 2015-11-06 21:07:41.024
Register End time is:- 2015-11-06 21:07:41.087
Time taken by 100 register operations is:- 63
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 21:07:39.538
Obtain End time is:- 2015-11-06 21:18:26.180
Time taken by 100 Obtain operations is:- 62657
Do you want to repeat menu (Y/N) ?
Y
```


6. 100 MB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 10 Files

Total Number of files system processing : 80 (8 * 10)

Each file Size : 100 mb

Time required for obtain operation :

Bytes/Second sent = $(80 * 100000000) / 55.636 = 143791789.4$ bytes

Files File_Size

```
Command Prompt - java Client...
3: Obtain File
4: Exit
Enter your choice:-
3
Register Start time is:- 2015-11-06 19:28:43.093
Register End time is:- 2015-11-06 19:28:43.947
Time taken by 10 register operations is:- 94
Do you want to repeat menu (Y/N) ?
Y
Reached Client menu
1: Register File
2: Search File
3: Obtain File
4: Exit
Enter your choice:-
3
Obtain Start time is:- 2015-11-06 19:29:04.211
Obtain End time is:- 2015-11-06 19:30:14.793
Time taken by 10 Obtain operations is:- 55058
Do you want to repeat menu (Y/N) ?
Y
```

7. 1GB file evaluation:

Total Number of Peers Connected : 8

Files each server processing : 1 File

Total Number of files system processing : 8 (8 * 1)

Each file Size : 1 gb

Time required for obtain operation :

$$\text{Bytes/Second sent} = (8 * 1000000000) / 50.798 = 157486515.21 \text{ bytes}$$

Files File_Size

The image displays eight screenshots of a Java client application running in Windows Command Prompt windows. Each window shows the following sequence of events:

- Menu Display:** A menu with options: 1: Register File, 2: Search File, 3: Obtain File, 4: Exit.
- User Input:** The user enters a choice (1, 2, 3, or 4).
- Operation Execution:** The application performs the selected operation, displaying start and end times and the time taken.
- Repeat Prompt:** The application asks "Do you want to repeat menu (Y/N) ?".
- Client Menu:** After a 'Y' response, a "Reached Client menu" is displayed with the same options as the initial menu.
- Repeat Prompt:** The application asks "Do you want to repeat menu (Y/N) ?" again.

Each screenshot represents a different operation (Register, Search, or Obtain) being performed multiple times. The timestamps and time taken values vary across the different operations and repetitions.