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Group 6
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Performance Test Report

We have implemented performance testing in our project in PerformanceTest.java junit test.

It contains one test case which tests performance and has defined 3 methods:

- **runGet()** – returns the duration of `kvClient.Get(key); in miliseconds.`
- **runPut()** – returns the duration of `kvClient.Put(key, value); in miliseconds.`
- **returnSetOfFiles()** – lists all the files from the certain directory.

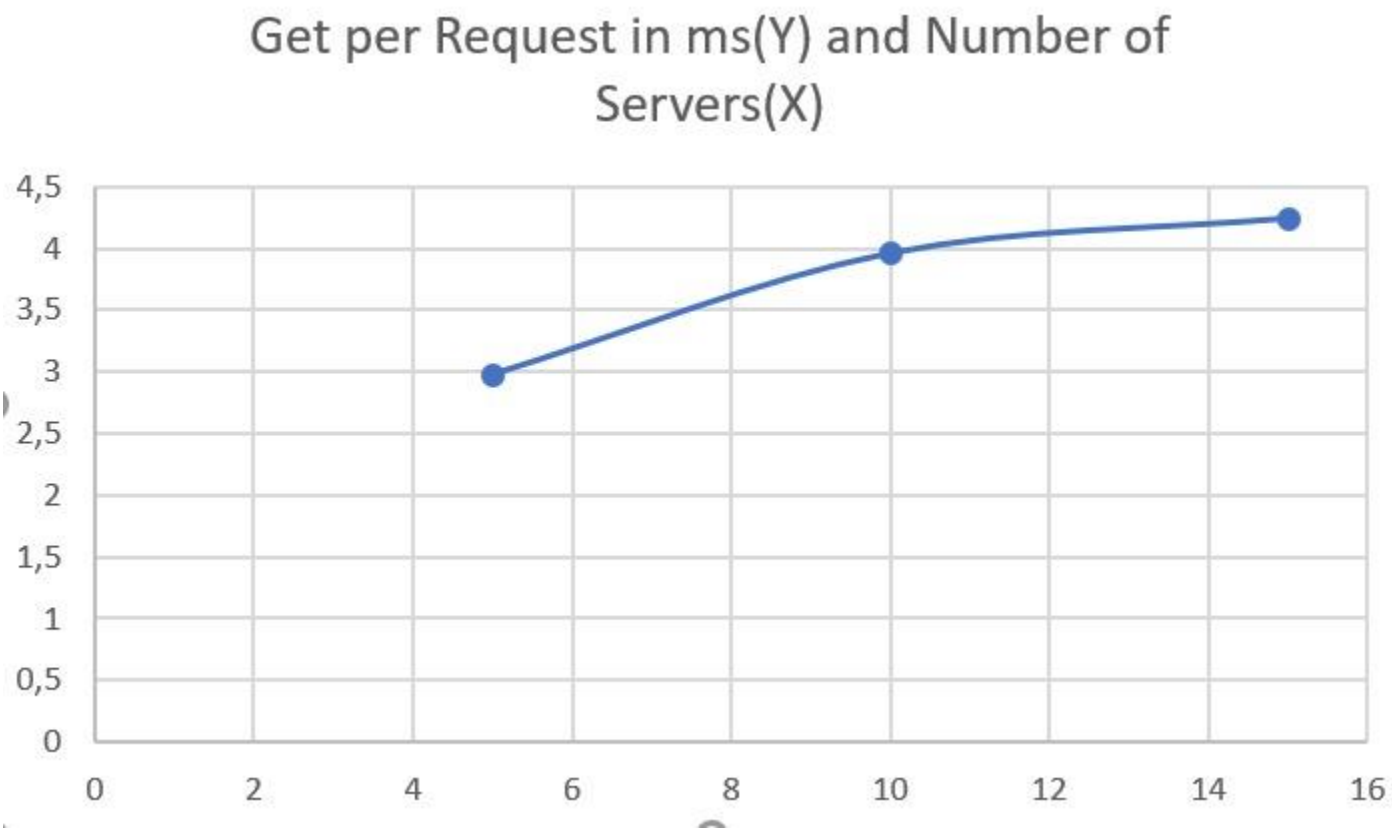
And one inner class:

- `SimulatedClient extends Thread` – has a `run()` method which creates an instance of KVClient class and calculates the running times and quantities of put and get requests.

The test case creates an instance of ECSServer, which creates a new HashRing, accepts command “initService <cacheSize> <numberOfServers> <cacheStrategy>” and performes accordingly.

Here are the reports of different tests of performance:

Number of Servers Test



Cache Type:LFU Cache Size 5

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========Report==========
Number of Servers: 5 Number of Clients: 1

Total Put Time in ms: 3541
Total Put Count: 1047
Total Get Time in ms: 3120
Total Get Count: 1047

Throughput: 100%

Cache Type:LFU Cache Size 5

Reached here....
========Report==========
Number of Servers: 10 Number of Clients: 1
Total Put Time in ms: 4437
Total Put Count: 1047
Total Get Time in ms: 3960
Total Get Count: 1047

Throughput: 100%

Cache Type:LFU Cache Size 5

Reached here....
========Report==========
Number of Servers: 15 Number of Clients: 1
Total Put Time in ms: 4677
Total Put Count: 1047
Total Get Time in ms: 4319
Total Get Count: 1047

Throughput: 100%

The The Get and Put time increases because the keys are distributed more across servers and clients need to contact different servers often in case **SERVER_NOT_RESPONSIBLE**

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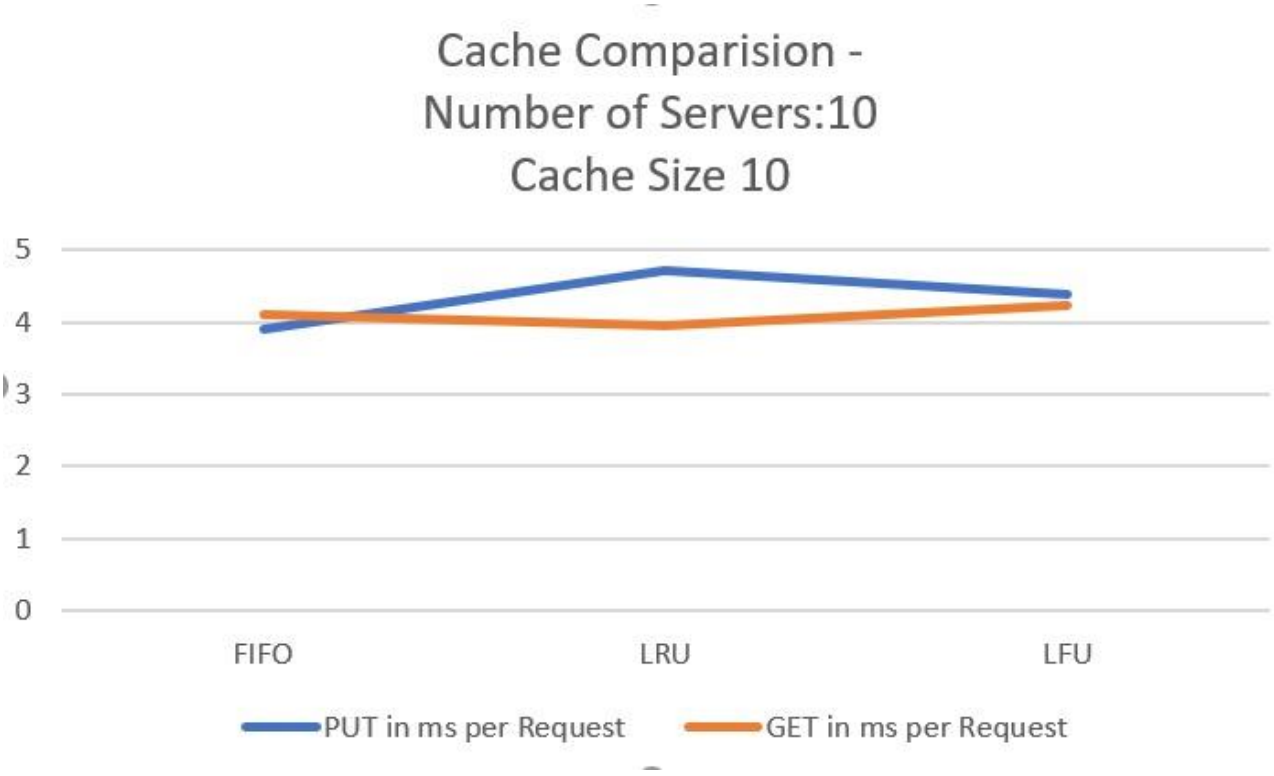
Cache Test



Cache Type:FIFO Cache Size 10

========Report==========
Number of Servers: 10 Number of Clients: 1
Total Put Time in ms: 4094
Total Put Count: 1047
Total Get Time in ms: 4290
Total Get Count: 1047

Throughput: 100%

Cache Type:LRU Cache Size 10

========Report==========
Number of Servers: 10 Number of Clients: 1
Total Put Time in ms: 4926
Total Put Count: 1047
Total Get Time in ms: 4145
Total Get Count: 1047

Throughput: 100%

Cache Type:LFU Cache Size 10

========Report==========

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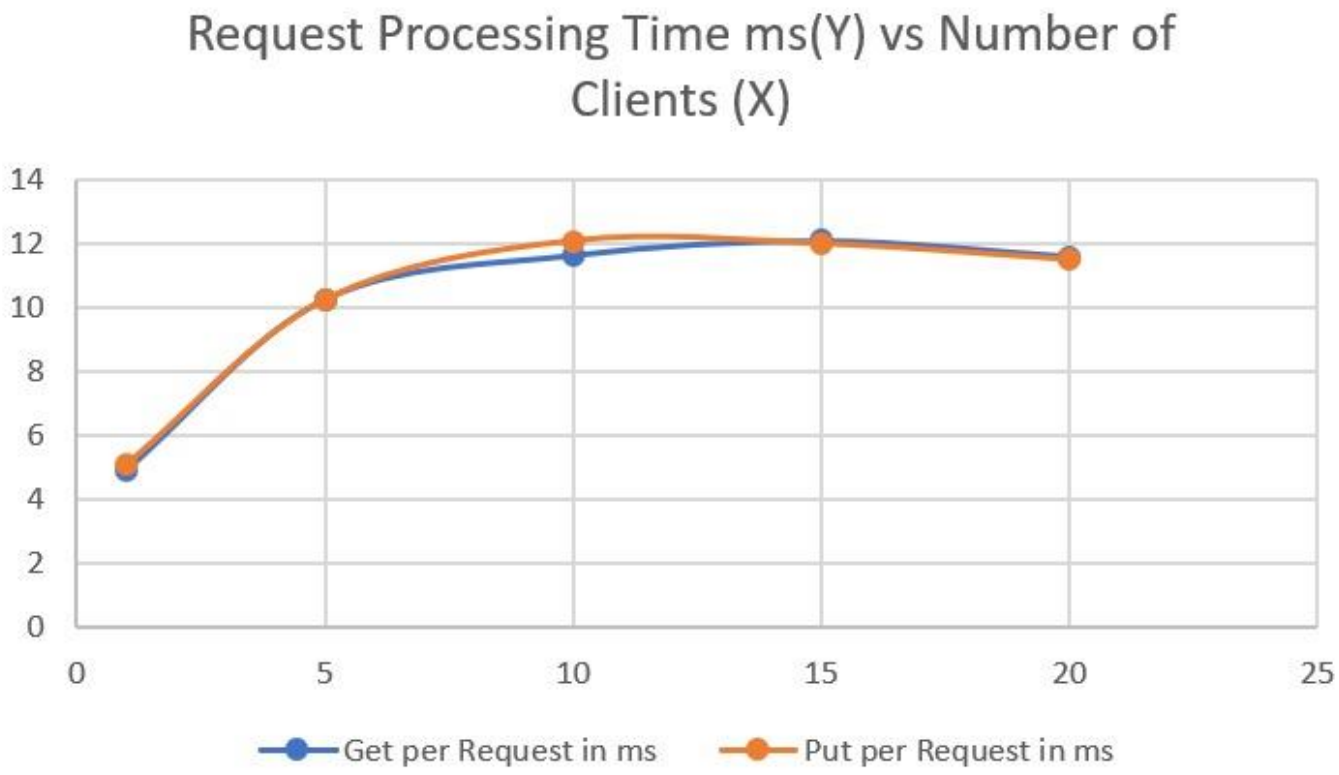
Number of Servers: 10 Number of Clients: 1
Total Put Time in ms: 4595
Total Put Count: 1047
Total Get Time in ms: 4440
Total Get Count: 1047

Throughput: 100%

Various Numbers of Clients



Cache Size: LFU Cache Size 10
========Report==========
Number of Servers: 10 Number of Clients: 10
Total Put Time in ms: 12651
Total Put Count: 1047
Total Get Time in ms: 12183
Total Get Count: 1047

Throughput: 100%

Cache Size: LFU Cache Size 10
========Report==========
Number of Servers: 10 Number of Clients: 15

Total Put Time in ms: 12557
Total Put Count: 1047
Total Get Time in ms: 12656
Total Get Count: 1047

Throughput: 100%

========Report==========
Number of Servers: 10 Number of Clients: 20
Total Put Time in ms: 12033
Total Put Count: 1047
Total Get Time in ms: 12139
Total Get Count: 1047

Throughput: 100%

========Report==========
Number of Servers: 10 Number of Clients: 5
Total Put Time in ms: 10741
Total Put Count: 1047
Total Get Time in ms: 10747
Total Get Count: 1047

Throughput: 100%

========Report==========
Number of Servers: 10 Number of Clients: 1
Total Put Time in ms: 5353
Total Put Count: 1047
Total Get Time in ms: 5155
Total Get Count: 1047

Throughput: 100%

Upscaling and downscaling

// This is the data when one server is added and removed during the process
==========Report==========
Number of Servers: 10 Number of Clients: 20
Total Put Time in ms: 10852
Total Put Count: 1047
Total Get Time in ms: 10848
Total Get Count: 841

Throughput: 841/1047
(Throughput is not 100%, because the server's enter Write Lock mode, where clients not allowed to PUT data during data migration phase)

//On run time scaled by added 3 more servers

========Report==========
Number of Servers: 5 Number of Clients: 20
Total Put Time in ms: 9176
Total Put Count: 1044
Total Get Time in ms: 9043
Total Get Count: 907

Throughput: 841/1047

// Removed 2 Servers on the fly

========Report==========
Number of Servers: 5 Number of Clients: 20
Total Put Time in ms: 4625
Total Put Count: 1046
Total Get Time in ms: 4604
Total Get Count: 1045

Throughput: 1045/1046