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| **Project Name:** | **Google Web page** |
| **Prepared by:** | Lam Nguyen |
| **Date (MM/DD/YYYY):** | 21/04/2019 |

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| **Test Plan** |
| **OBJECTIVE**  The objectives of the tests are to test the Google Home Page and ensure that it handles the expected production load.  **PLAN BRIEF**  The Google Application is deployed to a reduced scale production like environment and a set of load tests are run against that environment in order to determine scalability from a user perspective for the Google Home Page.  **CLIENT/SERVER ENVIRONMENT**  **Application Client:-**  JMeter Threads are HTTP clients emulating users sending requests to a server.  The client environment configuration is as follows,  Client IP - 10.8.81.196  Software Configuration :-   * Windows 7 Professional 64 bit OS SP1 * Apache JMeter Version 2.13 r1665067 * VisualVM Version 1.8.0\_60   Hardware Configuration :-   * 1 Physical Server * Quad Core Intel Xeon ® CPU@2.8 GHz * Cache Size 8 MB * 12GB RAM |
| **Test summary** |
| Users generate Google Home Page requests to the server with 1 second time delay (think time) between subsequent requests.  The **Client** is configured as follows :-  *Start Threads Count:* 150 Users  *Think Time:* 1 second (second time delay between subsequent requests)  *Hold Load :* 400 seconds  *Client Side Logging:* Error  The **Server** is configured as follows :-  Java Heap: -Xms -1g –Xmx -4g, GC algorithm is Parallel Scavenge Collector for the Young Generation Collections and Parallel Scavenge MarkSweep Collector for the Old Generation.  Ulimit: Unlimited  Logging: Logging is turned ON, and is in INFO mode  Maximum Threads: 1000  Monitoring: JMX monitoring is turned on |

**Test Results:-**

**Google Home Page – SUMMARY**

VIRTUAL MACHINE

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| **STATISTIC** | **VALUE** | **ACCEPTABLE(YES/NO)** |
| Average Response Time (milliseconds) | 1312 | YES |
| Average Throughput (TPS) | 39 hits/sec | YES |
| Error (%) | 0.0 | YES |
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| USER SUSTAINABILITY CONCLUSION | Based on statistics and assuming Little’s law[2], Google Home Page will be able to sustain around 39 concurrent users/requests per second. | |

**Google Home Page – Detailed Results and Statistics**

**TEST Date and Time**

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| **ENVIRONMENT** | **TEST DATE** | **TEST TIME** | **TEST LENGTH** |
| Virtual Machine | 04/03/2016 | 19:36 PM – 19:41 PM | 5 Minute |

**HTTP Response Times and Throughput**

VIRTUAL MACHINE

< Aggregate Report Image>

Graph 1: Aggregate Report - Response Time and Throughput

The Average Response Time is 1312 milliseconds and in 5 Minute, over 11.664 successful transactions were processed by the server. Average successful transaction rate is observed to be 39 transactions per sec. There were no errors / issues during this test.

***Client Experience (User Experience)***

Graph 1, 2 shows that the application is able to sustain around 39 concurrent requests/sec on average, maintaining an average response time of under 1500 milliseconds.

VIRTUAL MACHINE

**<** Response Time GraphImage**>**

Graph 2: Response Time Graph

Little’s Law [2]

In the theory of mathematical queues, The long-term average number of customers in a stable system *L* is equal to the long-term average effective arrival rate, *λ*, multiplied by the average time a customer spends in the system, *W*; or expressed algebraically: *L* = *λW*.

**Bibliography**

**[1]** <http://www.ibm.com/developerworks/java/library/j-jtp11253/>

**[2]** http://en.wikipedia.org/wiki/Little%27s\_law