**Report about conducted load test**

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**Application:** BlogEngine.NET version 3.2

**Environment:** Test Environment VirtualBox (Version 6.1.34 r150636 (Qt5.6.2))

**Test Environment configuration(RAM, CPU etc.):**

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| **Processor** | 11th Gen Intel(R) Core(TM) i7-1185G7 @ 3.00GHz 3.00 GHz (4 core) |
| **RAM** | 8 GB |
| **Hard Disk** | 60 GB |
| **Operating System** | Windows 10 Enterprise (21H2) |

1. **Why such testing was conducted:**

The report is included two methods of testing:

1. Smoke testing - was conducted to verification that the crucial functions of a program can be run and executed in the main workflow

2. Capacity Testing - was conducted to define the number of users that the application a given system will support and still meet performance goals

1. **Test script description:**

The features to be tested have been logically grouped to be covered 3 scripts that were developed followed by load requirement analysis for the modules. The below table captures the features covered by each script. The implement probabilities usage was divided by percentages for all threads (shown below tables):

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| --- | --- | --- | --- | --- |
|  | |  | | --- | | 1. Home Page: 15%  2. Open Random Date: 10%  3. Open Predefined Date: 30%  4. Search by Name: 30%  5. Open Large Calendar: 10%  6. Open Contacts: 5% | | |  | | --- | | 1. Open Random page (yes/no): 50% / 50%  2. Open post (yes/no): 80% / 20%  3. Random or First (yes/no): 65% / 35%  4. Comment (yes/no): 20% / 80% | |

1. **Tests:**  
   **Test run preconditions:**

* CSV file with Random dates
* Warmup script was running before each test run
* Before each new test script run, the webserver was reloaded, the test executed in NON-GUI mode
* There were used 3 Load Models**:**

**Load Model 1 (Posts quantity 100)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Name** | **Maximum number of simultaneous users** | **Ramp-Up period** | **Test duration** | **Probabilities usage** | **Number of posts quantity** |
| Blog\_Post\_Anonimus\_Task3 | 100 | 600 | 600 (sec.) | Random | 100 |
| Blog\_Post\_Anonimus\_Task6 | 100 | 600 | 600 (sec.) | Pre-Defined | 100 |

**Load Model 2 (Posts quantity 1000)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Name** | **Maximum number of simultaneous users** | **Ramp-Up period** | **Test duration** | **Probabilities usage** | **Number of posts quantity** |
| Blog\_Post\_Anonimus\_Task3 | 100 | 600 | 600 (sec.) | Random | 1000 |
| Blog\_Post\_Anonimus\_Task6 | 100 | 600 | 600 (sec.) | Pre-Defined | 1000 |

**Load Model 3 (Equals test results for** **‘Blog\_Post\_Anonimus\_Task6’ (Posts quantity 100 and 1000))**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Name** | **Maximum number of simultaneous users** | **Ramp-Up period** | **Test duration** | **Probabilities usage** | **Number of posts quantity** |
| Blog\_Post\_Anonimus\_Task6 | 100 | 600 | 600 (sec.) | Random | 100 |
| Blog\_Post\_Anonimus\_Task6 | 100 | 600 | 600 (sec.) | Pre-Defined | 1000 |

1. **Short summary on conducted tests:**

As a result of comparing 3 tests runs by **‘Load Model 1’** the capacity testing results, that throughput (max/ops) by pre-define probabilities are higher at 184%, and the user's maxed capacity is 91

|  |  |  |
| --- | --- | --- |
| **Test Name** | Users Capacity (max value) | Capacity Throughput (max/ops) |
| Blog\_Post\_Anonimus\_Task3 | 91 | 26 |
| Blog\_Post\_Anonimus\_Task6 | 91 | 75 |

As a result of comparing 3 tests runs by **‘Load Model 2’** the capacity testing results, that throughput (max/ops) by pre-define probabilities the value is fall in case of increase data to 1000 posts at 30%, and the user's maxed capacity falls at 14%, and for a not pre-define probabilities throughput (max/ops) is grown at 80%, and the user's maxed capacity is grown on 9%

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| --- | --- | --- |
| **Test Name** | Users Capacity (max value) | Capacity Throughput (max/ops) |
| Blog\_Post\_Anonimus\_Task3 | 100 | 47 |
| Blog\_Post\_Anonimus\_Task6 | 78 | 61 |

As a result of comparing 3 tests runs by **‘Load Model 3’** the capacity testing results, throughput (75 max/ops) by pre-define probabilities are shown, and the user's maxed capacity is 91 users in the case of created 100 posts, in case of increasing data to 1000 posts throughput is down to (61 max/ops) by pre-define probabilities are shown, and the user's maxed capacity is down to 78 users, by percentage value is for throughput is fall down to 18%, and for the user, the capacity falls on 14%

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| --- | --- | --- |
| **Test Name** | Users Capacity (max value) | Capacity Throughput (max/ops) |
| Blog\_Post\_Anonimus\_Task6 | 91 | 75 |
| Blog\_Post\_Anonimus\_Task6 | 78 | 61 |

1. **Detailed test results:**

‘Blog\_Post\_Anonimus\_Task3’ and ‘Blog\_Post\_Anonimus\_Task6’ scripts were running 3 times, according to the capacity testing results, the comfort zone and behavior has a different result.

**In case of ‘Blog\_Post\_Anonimus\_Task3’ (Results for (Number of posts quantity-100))** - The saturation point is approximately 68 users and comfort zone is 66 users. Degradation of successful queries is start after 66 users according to 3 test runs. After reaching a user’s capacity of 66 users, the server CPU is grooving to 100%.

**In case of ‘Blog\_Post\_Anonimus\_Task6’ (Results for (Number of posts quantity-100))** - The saturation point is approximately 81 users and comfort zone is 79 users. Degradation of successful queries is start after 80 users according to 3 test runs. After reaching a user’s capacity of 79 users, the server CPU is grooving to 100%.

**In case of ‘Blog\_Post\_Anonimus\_Task3’ (Results for (Number of posts quantity-1000))** - The saturation point is approximately 81 users and comfort zone is 80 users. Degradation of successful queries is start after 80 users according to 3 test runs. After reaching a user’s capacity of 80 users, the server CPU is grooving to 100%.

**In case of ‘Blog\_Post\_Anonimus\_Task6’ (Results for (Number of posts quantity-1000))** - The saturation point is approximately 57 users and comfort zone is 55 users. Degradation of successful queries is start after 55 users according to 3 test runs. After reaching a user’s capacity of 55 users, the server CPU is grooving to 100%.

**Test Run #1 (Load Model 1, Posts quantity 100)**

|  |  |
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| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #2 (Load Model 1, Posts quantity 100)**

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| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #3 (Load Model 1, Posts quantity 100)**

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| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #1 (Load Model 2, Posts quantity 1000)**

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| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #2 (Load Model 2, Posts quantity 1000)**

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| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #3 (Load Model 2, Posts quantity 1000)**

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| --- | --- |
| **Blog\_Post\_Anonimus\_Task3** | **Blog\_Post\_Anonimus\_Task6** |
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**Test Run #1 (Equals test results for** **‘Blog\_Post\_Anonimus\_Task6’ (Posts quantity 100 and 1000))**

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| --- | --- |
| **Blog\_Post\_Anonimus\_Task6(Posts quantity 100)** | **Blog\_Post\_Anonimus\_Task6(Posts quantity 1000)** |
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**Test Run #2 (Equals test results for** **‘Blog\_Post\_Anonimus\_Task6’ (Posts quantity 100 and 1000))**

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| --- | --- |
| **Blog\_Post\_Anonimus\_Task6(Posts quantity 100)** | **Blog\_Post\_Anonimus\_Task6(Posts quantity 1000)** |
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**Test Run #3 (Equals test results for** **‘Blog\_Post\_Anonimus\_Task6’ (Posts quantity 100 and 1000))**

|  |  |
| --- | --- |
| **Blog\_Post\_Anonimus\_Task6 (Posts quantity 100)** | **Blog\_Post\_Anonimus\_Task6(Posts quantity 1000)** |
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1. **Conclusion:**

The server worked is unstable, as shown by the different test results according to received data, in some cases CPU was filled on 100% and some cases were finished without filling of CPU on 100%

The 5XX – errors were not found

The 404 - errors are approximately 2-3% for posts quantity 100 and approximately 5% for posts quantity 1000

The main error was “Non-HTTP response code: java.net.SocketTimeoutException/Non HTTP response message: Read timed out” which down the user's possibility of sending the new requests on the server. After saturation point, the number of errors was grown, and the CPU has been risen to 100% the consequence response time from the server was growing up too that exceeding 60 seconds.

Recommendation:

Should be created research on memory leak