**Report about conducted load test**

**Date:** 11.08.2022

**Author:** Shushanik Tonoyan

**Application:** BlogEngine.NET version 3.2

**Environment:** Test Environment

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

|  |  |
| --- | --- |
| Processor | Intel(R) Core(TM) i7-10610U CPU 1.80 GHz 2.30 GHz |
| RAM | 3.95 GB |
| System type | 64-bit operating system |
| Operating System | Windows 10 Enterprise 21H1 |

1. **Why such testing was conducted:**
2. To perform longevity test and validate application stability over a longer period against appropriate load and stress condition.
3. **Test script description:**

The following script should be run for

1. Anonymous script with probability usage is implemented according to the following table

|  |  |
| --- | --- |
| **Flow** | **Execution percentage %** |
| Home Page | 15 |
| Open Random Date | 10 |
| Open Predefined Date | 30 |
| Search by Name | 30 |
| Open Large Calendar | 10 |
| Open Contacts | 5 |
| Open Random page (yes/no) | 50/50 |
| Open post (yes/no) | 80/20 |
| Random or First | 65/35 |
| Comment (yes/no) | 20/80 |
|  |  |

1. Admin script
2. Editor script

**Anonymous script**

Diagram

Description automatically generatedDiagram

Description automatically generatedDiagram

Description automatically generated

**Admin Script**

Diagram

Description automatically generated

**Editor Script**

Diagram

Description automatically generated

1. **Tests:**   
   **Metrics to monitor:** average throughput, response time 95th percentile, error rate, and CPU usage.  
   **Test run preconditions:** 2 admins, 2 editors should be created. 1000 posts created by different users.

**Base configuration:** CPU count 1, RAM 4 GB. For the configuration mentioned, the capacity test has been conducted. According to the capacity test, the saturation point is around 95 users, and the application stays in the comfort zone while the users count is less than 75 users. On the base of this results, the low load was defined to be 30 users.

**Load Model:**

The longevity test for the application under test was conducted. The low load was defined on the base of the capacity test result.

**Low load**: as 30 virtual users.

Load testing. Two test runs were conducted overall for 30 users. Duration of first run 8 hours, for second run 9.5 hours. Constant delay between requests 2 sec with deviation 0.10 sec.

|  |  |  |
| --- | --- | --- |
| **Users** | **Threads count** | **Rampup in seconds** |
| Admins | 2 | 120 |
| Editors | 2 | 120 |
| Anonymous Users | 26 | 120 |

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

The purpose of this test was to analyze the system performance under low load conditions over a long amount of time. There were two test launches lasting 8 and 9.5 hours. Detailed test results presented on the section 5 of the report. According to test results system is performing the required operations on the defined amount of time against defined load. There is no system brake observed during two runs. But several spikes with duration from 15 to 45 minutes were observed for both runs.

Detailed analyze of test results showed, that mentioned spikes were caused by CPU usage increase.

1. **Detailed test results:**

Results of two different runs are presented in the table.

|  |  |  |
| --- | --- | --- |
|  | 1st run | 2nd run |
| Throughput (Req/s) | 12 | 13.38 |
| Response Time | 2.03 s | 719 ms |
| Error Rate % | 0.2 | 0.05 |
| CPU usage % | 40 | 30.7 |

**1 test was conducted for 8 hours.**

**Chart

Description automatically generated**

On the charts above the behavior of response time and throughput over time are displayed. As it follows from the charts, the throughput and response time are mainly stabile, but nevertheless several spikes are present. Particularly, there are observable spikes at the response time chart at 01:30-02:00, 02:45-:03:30 and 03:45-04:00. The throughput decreases are observable for the same periods.

**A screenshot of a computer

Description automatically generated with medium confidence**

The detailed analysis of CPU usage shows that grows dramatically in highlighted time periods, which in turn led to the growth of the response time.

Also, at mentioned time periods the dramatical increase of errors count is observed.

Chart

Description automatically generated

**A screenshot of a computer

Description automatically generated with medium confidence**

**2 Test was conducted for 9.5 hours.**

Second test run was conducted for 9.5 hours.

**Chart

Description automatically generated**

**A screenshot of a computer

Description automatically generated with medium confidence**

**A picture containing timeline

Description automatically generated**

During the second run we can see spikes on the response time charts caused by CPU usage growth as well.

1. **Conclusion: On the base of the conducted long-time test result it has been shown that during the long run under the low load from time-to-time CPU usage increase is observed, which causes spikes on the response time charts. But system recovers after such spikes. To improve the system performance, it will be good to add more CPUs. There was no observed system brake for 9.5 hours test run.**