

Load Testing with Stepping Thread Group in JMeter

: Implementation and Analysis

Date: May.27.2023

This test was conducted using modern and realistic parameters to ensure that it did not cause any excessive load to the URL.

The purpose of this test is to showcase the implementation of the Stepping Thread Group in JMeter, a powerful load testing feature. This test aims to demonstrate the ability to gradually increase the number of threads over time, simulating realistic user behavior and load patterns.

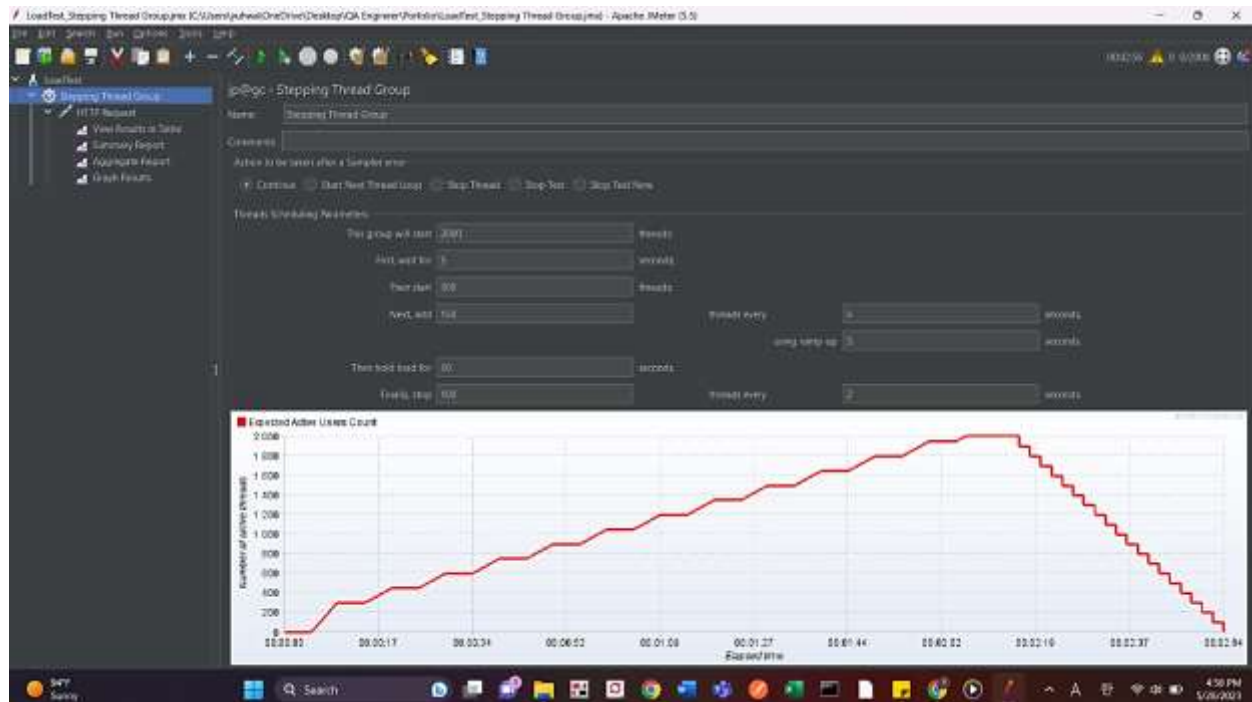


Figure1. Stepping Tread Group

The Stepping Thread Group is designed to simulate a load test with specific configurations. The test is set to start with 2000 threads. Initially, it waits for 5 seconds before starting the test with 200 threads. The next step involves adding 200 threads every 20 seconds using a ramp-up of 10 seconds. This allows the load to gradually increase over time. Once the desired thread count is reached, the load is held constant for 100 seconds, ensuring a stable and sustained load on the system under test. Finally, the test is stopped by reducing the thread count by 20 threads every 2 seconds.

This configuration helps simulate a realistic user scenario, where the load gradually increases, remains constant for a period, and then decreases. It provides insights into how the system performs under different load conditions and helps identify any performance issues or bottlenecks. By analyzing the metrics and results obtained from this test, such as response times, throughput, error rates, and resource utilization, valuable information can be gathered to optimize the system's performance and ensure it can handle the expected load effectively.

Summary Report

Name: Summary Report

Comments:

Write results to file / Read from file

Filename:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput /s	Received KB/sec	Sent KB/sec	Avg. Bytes
HTTP Request	30483	5799	540	69006	1207.60	0.00%	213.0/sec	76798.16	25.17	100548.2
TOTAL	30483	5386	502	68006	1207.60	0.00%	213.0/sec	76798.16	25.17	100548.2

Figure2. Summary Report

Based on the information obtained from the Summary report of the Load Test, we can draw significant conclusions about the system's performance.

Error Rate: The error rate recorded during the test is 0.00%, indicating that no errors or failures were encountered while executing the test scenarios. This suggests that the system handled the applied load successfully without any critical issues. However, it is important to note that the absence of errors in a single test does not guarantee error-free performance in all scenarios or under different loads.

Throughput: The throughput value measured at 213.0 sec represents the number of requests processed per second. In this test, the system demonstrated a throughput of 213.0 requests per second, indicating its capacity to handle the incoming workload. This value reflects the system's efficiency in processing requests within a given time frame.



Sample #	Start Time	Test/Name	Label	Sample Duration	Status	Bytes	Sent Bytes	Latency	Connect Duration
1	16:54:30.847	Stopping Thread Group	HTTP Request	0.007	Success	100542	433	488	0.16
2	16:54:30.856	Stopping Thread Group	HTTP Request	0.009	Success	100525	433	503	0.25
3	16:54:30.863	Stopping Thread Group	HTTP Request	0.008	Success	100534	433	502	0.17
4	16:54:30.873	Stopping Thread Group	HTTP Request	0.008	Success	100579	433	517	0.01
5	16:54:30.883	Stopping Thread Group	HTTP Request	0.011	Success	100532	433	562	0.15
6	16:54:30.893	Stopping Thread Group	HTTP Request	0.016	Success	100593	433	512	0.57
7	16:54:30.907	Stopping Thread Group	HTTP Request	0.022	Success	100567	433	511	0.77
8	16:54:30.915	Stopping Thread Group	HTTP Request	0.014	Success	100554	433	507	0.18
9	16:54:30.948	Stopping Thread Group	HTTP Request	0.022	Success	100538	433	506	0.72
10	16:54:30.971	Stopping Thread Group	HTTP Request	0.009	Success	100516	433	521	0.16
11	16:54:30.994	Stopping Thread Group	HTTP Request	0.010	Success	100502	433	461	0.12
12	16:54:31.018	Stopping Thread Group	HTTP Request	0.009	Success	100517	433	466	0.16
13	16:54:31.042	Stopping Thread Group	HTTP Request	0.009	Success	100501	433	466	0.16
14	16:54:31.071	Stopping Thread Group	HTTP Request	0.022	Success	100599	433	460	0.72
15	16:54:31.077	Stopping Thread Group	HTTP Request	0.006	Success	100507	433	502	0.16
16	16:54:31.081	Stopping Thread Group	HTTP Request	0.003	Success	100575	433	466	0.13
17	16:54:31.088	Stopping Thread Group	HTTP Request	0.009	Success	100562	433	467	0.15
18	16:54:31.106	Stopping Thread Group	HTTP Request	0.013	Success	100567	433	461	0.16
19	16:54:31.074	Stopping Thread Group	HTTP Request	0.003	Success	100558	433	503	0.12
20	16:54:31.006	Stopping Thread Group	HTTP Request	0.008	Success	100567	433	523	0.43
21	16:54:31.154	Stopping Thread Group	HTTP Request	0.004	Success	100567	433	466	0.03
22	16:54:31.158	Stopping Thread Group	HTTP Request	0.004	Success	100515	433	509	0.16
23	16:54:31.122	Stopping Thread Group	HTTP Request	0.004	Success	100566	433	464	0.14
24	16:54:31.170	Stopping Thread Group	HTTP Request	0.012	Success	100566	433	466	0.15
25	16:54:31.176	Stopping Thread Group	HTTP Request	0.003	Success	100567	433	466	0.16

Figure 3. View Results in Table

Limitation of the Test.

It's crucial to consider the limitations of the test results. While the load test provides valuable insights into the system's performance under specific conditions, it may not fully simulate real-world scenarios. The test was conducted under controlled conditions and with a predefined set of test scenarios, which may not fully represent the actual user behavior or the variability of network conditions.

Therefore, it's important to interpret the results within the context of the test setup and consider conducting additional tests with different parameters or scenarios to gain a comprehensive understanding of the system's performance.