Load Testing with Stepping Thread Group in JMeter

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This test was conducted using modern and realistic parameters to ensure that it did not impose excessive load on the URLs.

The purpose of this report is to provide an overview of a load testing activity conducted using the Stepping Thread Group feature in Apache JMeter. The primary focus of the report is to evaluate the load handling capabilities of three different searching platforms, referred to as A, B, and C, to maintain confidentiality.

Test Environment

Application	Apache JMeter 5.5
Hardware Device	LG Gram, Laptop
OS	Microsoft Windows 11 Home
Version	10.0.22621 Build 22621
Processor	11th Gen Intel(R) Core(TM) i5-1155G7

Test Scenario

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 100 threads every 5 seconds using a ramp-up of 5 seconds. This allows the load to gradually increase over time. Once the desired thread count is reached, the load is held constant for 10 seconds, ensuring a stable and sustained load on the system under test. Finally, the test is stopped by reducing the thread count by 100 threads every 5 seconds.

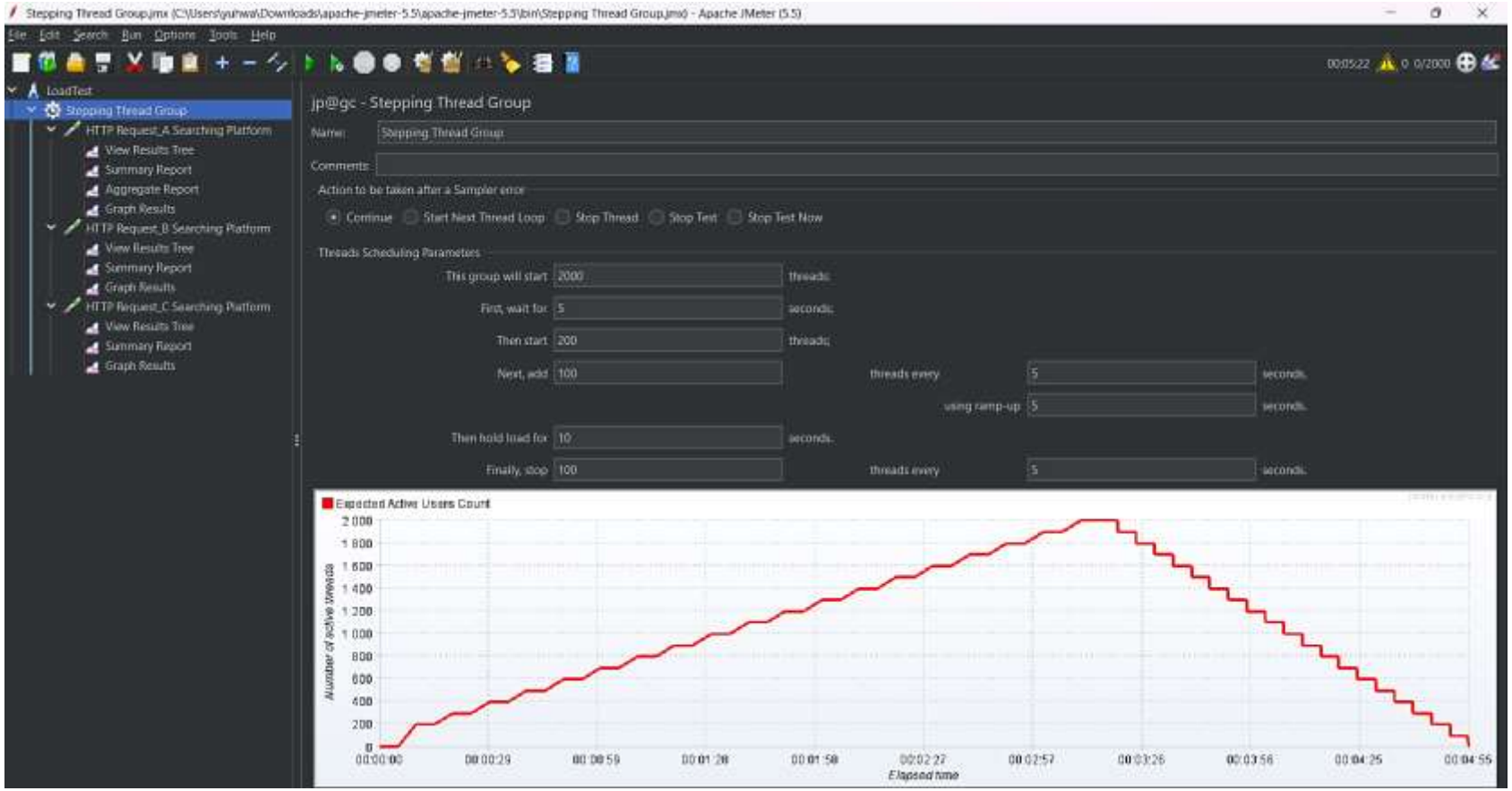

Figure 1. Stepping Tread Group – Captured Image

HTTP Request	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput /sec	Received KB/sec	Sent KB/sec	Avg. Bytes
A Searching Platform	23359	3747	1	15536	2985.37	20.96	136.9	9491.75	12.37	70977.4
B Searching Platform	22416	2151	1	12378	1506.63	23.06	133.0	715.04	12.79	5506.3
C Searching Platform	21980	2491	1	15362	2655.61	37.68	131.0	1665.37	9.88	13020.3

Figure 2. Summary Report in Table Format

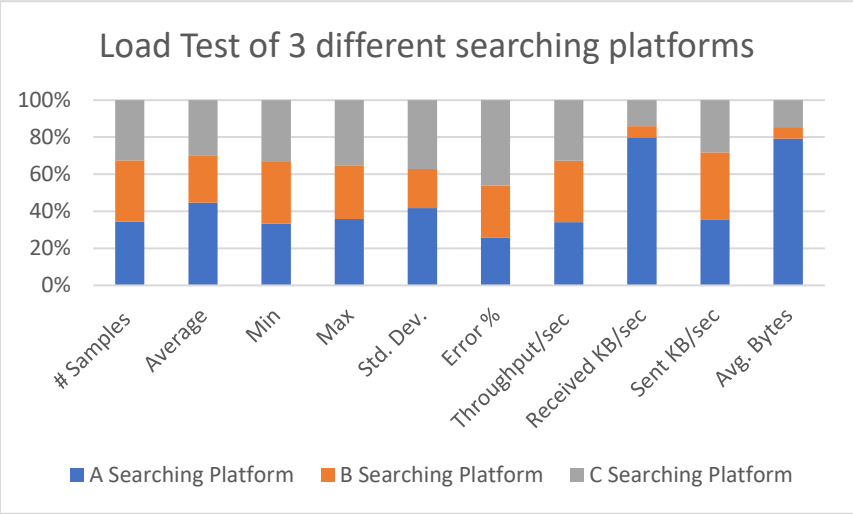

Figure 3. Load Test of D Platform. 100% Stacked Column.

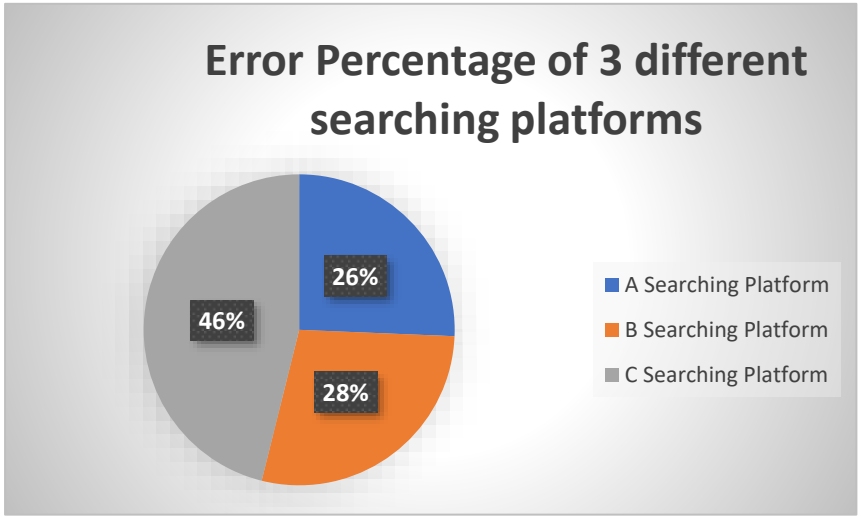

Figure 4. Error Percentage of 3 different searching platforms

Error Analysis

Platform	Error Type	Error Rate	Estimated Error Count
A	Socket closed, Address already in use	47%	10,980
	Connection attempt failed	23%	5,374
	*****.com:443 failed to respond	12%	2,797
	Connection reset	8%	1,859
	An established connection was aborted	10%	2,336
B	Address already in use	69%	15,470
	Connection reset	31%	6,946
C	Address already in use	100%	21,980

Figure 5. Error Type, Rate and Count by Platforms

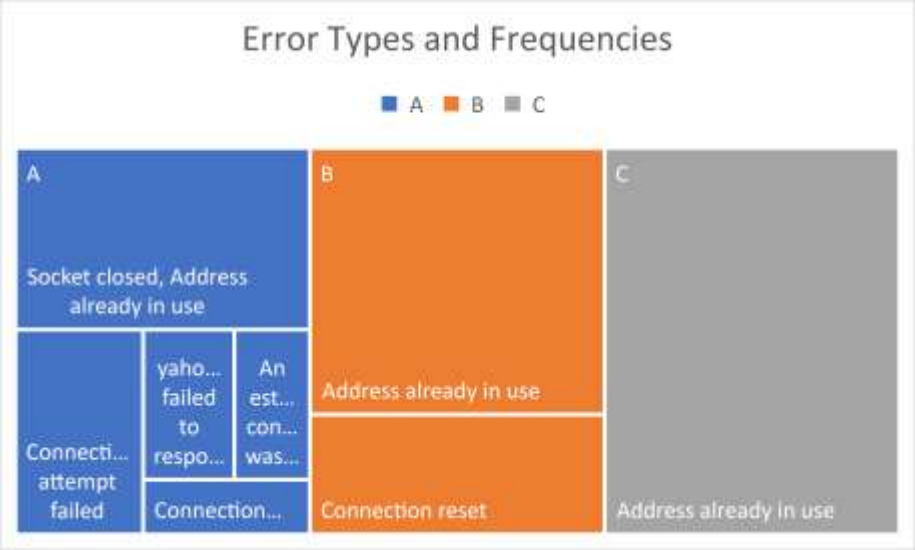

Figure 6. Error types and Frequencies

For a more comprehensive understanding of the errors encountered, please refer to the attached log file. The log file contains detailed information that can aid in troubleshooting and identifying the underlying causes of the observed errors. Analyzing the log file in conjunction with the error analysis will provide valuable insights into the performance of the platforms and facilitate targeted improvements to address the identified issues.

The actual log files are not included in this report due to security reasons, as it is published in a public GitHub repository.

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.