

An analysis of performance for user load testing on key pages at 1, 10, 50, and 100 concurrent users.

The following performance study provides the outcomes of load testing conducted on several pages of an application, encompassing varying user loads of 1, 10, 50, and 100 users. Key performance indicators, including average response time, throughput, error percentage, and percentile lines (90%, 95%, and 99%), are employed to assess the efficiency of the system.

1. User Test: Petstore Page: The Petstore page exhibits an exceptionally high average response time of 1686 ms, accompanied by a 100% error rate. This observation suggests significant performance limitations, potentially caused by inefficiencies in the backend such as unoptimized database queries or delays on the server side.

Other pages, including Catalog, Account, and AddToCart, exhibit very modest average reaction times, ranging from 400 to 600 ms, and maintain a 0% error rate, indicating their strong performance even under low load conditions.

Overall, the average response time for all pages is 592 ms. However, the issue of a 40% error rate, mostly attributed to the Petstore page, is of considerable concern.

10 User Test: Petstore Website: The Petstore page consistently exhibits poor performance in this benchmark, with an average response time of 1202 ms and a 100% error rate, which aligns with the results of the 1-user test.

Other Pages: These pages demonstrate a minor increase in response times compared to the 1-user test, but all remain below 500 ms except for ConfirmOrder (664 ms).

Importantly, they still maintain a 0% error rate, proving stability under increased load.

In general, the mean reaction time for all pages rises to 548 ms, but, the Petstore page significantly influences the overall mistake rate, presenting a 40% deviation. The system can manage greater load, however the Petstore website remains problematic.

50 User Test: Petstore Page: The Petstore page continues to underperform with an average response time of 1150 ms and a 100% error rate. The highest response time for this page reaches 1686 ms, showing that the performance bottleneck becomes more acute as user load grows.

Other Pages: The response times for other pages such as Catalog, Account, and ViewProduct average about 450-460 ms. These pages manage the 50-user load efficiently, with 0% error rate, and remain within acceptable performance constraints.

ConfirmOrder & SignIn: These pages show somewhat greater response times (672 ms and 467 ms, respectively), but maintain a 0% error rate, showing that the system is still running smoothly under pressure for these tasks.

Overall: The throughput reaches 12.3 requests per second. However, the 40% mistake rate, mostly due to the Petstore page, continues to harm overall performance. The system as a whole can manage the traffic, however the Petstore page requires improvement.

100 User Test:

Petstore Page: The Petstore website performs considerably worse under 100 users, with an average response time of 1266 ms and a 100% error rate. The maximum response time spikes to 3750 ms, hinting to substantial backend difficulties, perhaps linked to database performance, resource exhaustion, or network latency.

Other Pages: The response times for other pages increase slightly but remain low. For instance, the Catalog page averages 531 ms, whereas Account and Category pages have response times around 506-520 ms. These figures are acceptable, especially for a system managing 100 concurrent users.

ConfirmOrder & SignIn: These pages demonstrate marginally greater reaction times, with ConfirmOrder average 686 ms and SignIn at 476 ms. Both still retain a 0% error rate and are working well despite the increasing user demand.

Overall: The throughput improves to 20.5 requests per second. However, the overall error rate is now 40.25%, mostly owing to the Petstore page, which needs to be addressed to ensure consistent performance at larger loads.

Key Insights:

Petstore Page Bottleneck: Across all tests, the Petstore page demonstrates serious performance difficulties, with a 100% error rate and high reaction times. This points to backend inefficiencies, such as delayed database queries or insufficient server resources. Immediate optimization is required here.

Stable Performance for Other Pages: Pages like Catalog, Account, and ViewProduct function well even under increased user traffic, with response times that remain fair and 0% error rates. These pages are well-optimized, and the system can scale with more users for these functions.

Throughput rise: The system displays a healthy rise in throughput as the user load grows, from 12.3 requests per second with 50 users to 20.5 requests per second with 100 users. This indicates the backend's capacity to scale, while the error rate for the Petstore page dampens the overall performance.

Impact of Load on Response Times: While there is a minor increase in response times as the number of users rises, these increases are within acceptable bounds for most pages. This displays the system's robustness for managing several users concurrently, except for the Petstore page.

Recommendations:

Optimize the Petstore Page: The critical job is to resolve the performance bottleneck on the Petstore website. This can be done by examining server logs, optimizing database queries, applying caching mechanisms, or scaling server resources.

Monitor Key Metrics: As user traffic increases, maintain monitoring throughput, response times, and error rates to ensure the system scales smoothly.

Prepare for Higher Loads: Given the stable performance of most sites, the system can manage additional users, but fixing the Petstore page's difficulties is critical before expanding further.

By resolving these concerns, particularly the performance bottleneck in the Petstore page, the system can gain improved scalability and give a more consistent user experience under large loads.