Web application stress test service

Date: 22/07/2021
Version: 1.0

A. Overview

Stress testing is a testing activity that determines the robustness of a software or infrastructure by testing beyond the limits of normal operation.

We at sapnagroup offer services to stress test your websites, web-apps, and APIs and simulate hundreds or thousands of concurrent user sessions.

The stress test we offer are used for 3 different scenarios

1. Confirm system/application can support simultaneous “n” number of users
2. Check the increase in performance from architecture A to architecture B
3. Check for problems and bottlenecks in the system/application

Some of the advantages/features of running such stress tests are

- Test user experience under load
- Verify performance
- Identify bottlenecks
- Ensure scalability
- Real user simulations
- Multi-step scripting
- 40+ browsers/devices
- Stress test critical paths
- Simulate API calls
- Supports SOAP & REST
- Validate API responses
- Verify SLA requirements

B. Steps involved in conducting a stress test are

- **Prepare environment:** Prepare the environment and software which will be stress tested. This should be separate from the live environment and on a test server with e.g. emails disabled etc.

- **Plan test cases:** Our team will discuss the test cases (user journeys). They can be as simple as visiting the homepage, or performing a series of steps, like logging in, filling a form, submitting it and logging out. As it's expensive to run these tests we usually recommend to have 2 different test cases: 1st one which uses more reads from the database, and involves traffic that e.g. land on the homepage, or newsletter links where most users may not click more pages. 2nd test is where the users are more engaged and perform database write operations etc.

- **Max simultaneous users:** We decide on the number of users needed for the test. Ideally if we aim to test max 500 users, we should start with 200 users and move to 500 in steps of 100 to see how the system performs against the increase of users.

- **Conduct the stress test:** Our team will then conduct the stress test given all the data provided before. The team will note the parameters and make a performance matrix so that this information can be analysed later.

- **Evaluate the results:** The performance matrix is evaluated across key parameters. Any unexpected results are flagged and if possible investigated along with the dev and devops team. If problems can be isolated and fixed and scope allows, then a retest is conducted.

- **Prepare the report:** A final report is prepared based on the performance matrix. The report includes challenges faced, and any future recommendations suggested.

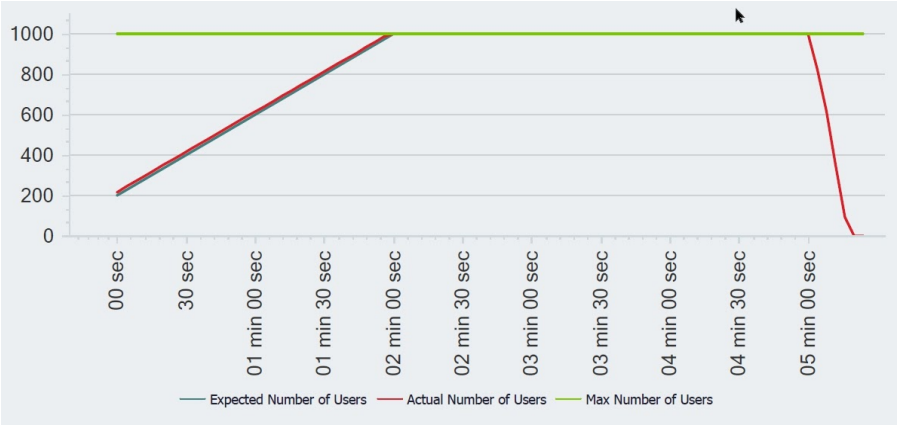
- **Discussion with the client:** We discuss the final findings with the client and take them through the report

C. Example stress tests

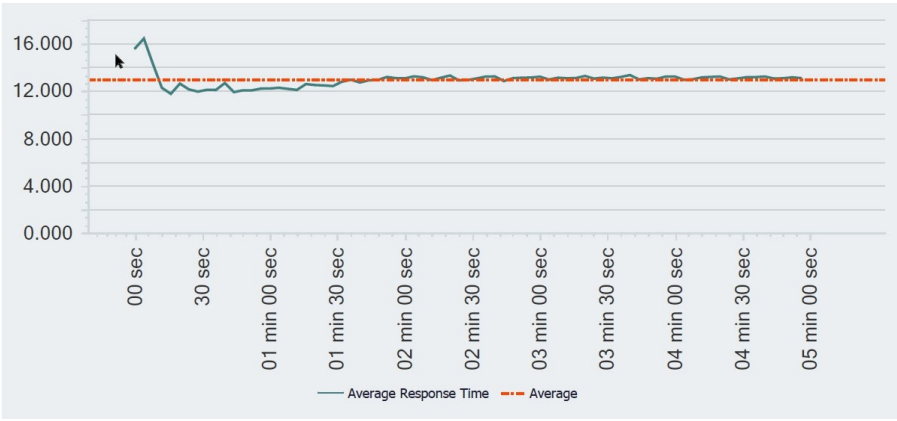
1. Confirming that the application/system can handle 1,000 simultaneous users.

Test	Users	Avg	Max	Completed	Failed	Error %	Result
TC01	500	12.8563	26.004	7736	0	0	Success
TC01	1000	12.9747	22.841	15490	119	0.76	Success
TC02	500	15.1069	35.134	2762	0	0	Success
TC02	1000	15.0656	21.886	5561	0	0	Success

Performance matrix across 2 test case scenarios TC01 and TC02, with 500 and 1000 users. The matrix clearly shows that across all text cases the result was a success with negligible failures.

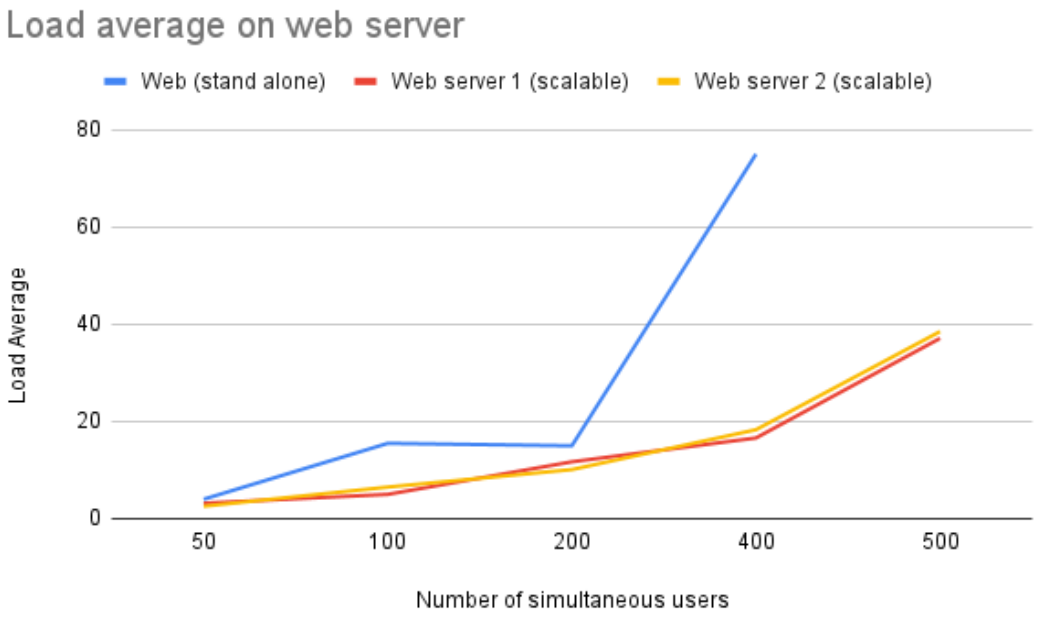


Number of user sessions over the duration of the test. This shows how every 30 seconds the number of simultaneous user sessions were increased by 200. Accordingly after 2 mins we reached the max required for our test of 1000 users. Both expected and actual number of users are a match.



Average response time per session over the duration of the test, this is also an important figure to confirm that as the number of users increased over time the average response time remained the same.

2. **Comparing web server load across 2 architectures** (stand alone, and scalable load balancing). The below graph clearly shows that having 2 web servers (red and orange) in a load balancing scalable system has distributed the load across multiple servers, and is more effective for users above 200 as compared to a standalone web server (blue)



D. Costs and contact

Costs vary based on the requirements, so please email us at onlinestatus@sapnagroup.com or call us 01737 887808 - option 1 at for more information.