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# Criteria to consider for a successful performance testing tool selection

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# ABSTRACT

To inform our audience about the criteria for a successful performance testing tool selection for testing performance on any software stack.

The right test tool enables the productivity, optimization, and scale required. It provides the opportunity to find best test tool and evaluate its services faster, and establish successful implementation using it.

Keywords: Performance testing, Load testing, Performance testing tool.

# **1. MAIN BODY**

# What is performance testing

Performance testing is an aspect of non-functional testing, goal of which is to collect information about system stability and responsiveness under various workload. Performance testing provides insight on scalability, reliability and resource usage of the system under test.

## Why performance testing done

Performance testing consists of multiple subtypes of tests, which help to determine if system is capable to handle desired load and helps to understand what the bottlenecks are. This type of tests helps to understand what improvements should be done to code or configuration before going live.

## Importance of performance testing

Performance tests are necessary to have properties of the system that cannot be achieved or proven by functional testing, such as:

- better performance
- increased Stability
- proven Scalability

## What are the parameters to consider while selecting a performance testing tool

Various parameters needed to be considered, here is the list below

• Basic requirements

List contains what are the basic parameters to look at first:

1. Platform Compatibility - The tool should be able to function well on various platforms

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- 2. **GUI friendly** Graphical user interface is a type of user interface that allows users to interact with ease. Tool should be capable to interact with GUI of the application.
- 3. **Recording GUI Scenarios** tool should provide ability to manually record GUI scenarios and convert them to test scripts
- 4. **Command Line Support** Command line interface is means of interacting with a computer program where the user issues commands to the program in the form of successive lines of text (command lines). Tool should be able to issue and accept commands through Command line interface which is useful if tool will be used to do automated tests on Jenkins or other build management tool
- 5. Ease of Learning Tool should be easy to learn
- 6. Web Protocol Support Web protocols are TCP/IP stands for Transmission Control Protocol/Internet Protocol. The Internet Protocol part of the standard refers to the addressing of data message packets. UDP, HTTP and FTP are the additional protocols which have different functions and purposes that ultimately work together to provide assorted capabilities through World Wide Web. Tool should support all the Web Protocols
- 7. Reporting Capability Tool should have Reporting Capability
- Flexibility requirements:
  - 1. **Functional API testing support** An application programming interface, or API, works to connect an application to the web and to other APIs. API testing is testing the APIS and the integrations they enable work in the most optimal manner. Functional API testing should be done using the tool
  - 2. **Test Scripting/Assertion Language** The Script assertion runs a groovy script to perform custom checks on the message. You can verify the message content, headers, properties and other components. Test Scripting can be done through the tool
  - 3. **Mock web service creation** Service Mocking or simulation is the practice of creating a facsimile environment that works similar to the environment you're facsimileing. Tool should give ability to create mock web services with advanced behavior.

# • Maintainability

Easy to Maintain test set: adding new scenarios, building test scenarios based on existing ones, bulk edit of test parameters.

## • Community

Active community generates positive feedback loop and as result lots of manuals, support forums and further development of the tool. How to determine if tool has active and supportive community? You need to looks for:

- 1. Stackoverflow most searched Tool should be searched mostly in Stack overflow
- 2. Stackoverflow most votes Most votes for the tool in the Stack overflow.
- 3. Market Demand The aggregate of the demands of all potential customers for a specific product over a specific period in a specific market.
- 4. **Support from Forums/Community** Tool should have Support from Forums/Community where you can share your questions or proudly present your solution to a problem.

## • Requirements related to Load

Tool should be able to generate required load. What is testers' PC against 48 stack of multiple 48 core servers? Tool should provide ability to generate sufficient load on server. To ensure this, pay attention to following properties of the tool:

- 1. **Scalability** Scalability is the capability of a system, network or process to handle a growing amount of work, or its potential to be enlarged to accommodate that growth. If tool is scalable, it becomes handy for generating high load that cannot be done by one instance of the tool
- 2. **Best throughput** Throughput is the maximum rate of production or the maximum rate at which something can be processed. Tool should give the Best Throughput
- 3. **KB/sec Processed** Processing rate is very important for scalability testing of the application, especially emulating UI interaction which would require download of UI code and API call execution.
- 4. **Best response time** Response time is the total amount of time it takes to respond to a request for service. Tool should give the Best Response time under maximal load to generate higher possible load

Below is the example where the parameters considered

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Use Case 1 – Measure the performance of a specific Widget/API response time and throughput when the application user logs in with username/password through GUI.

Real Chrome browser response time for single user - 859ms

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- **4** Using Jmeter to record the browser scenario to measure the api performance
- 1) Follow STEPS TO RECORD A BROWSER SCENARIO USING HTTP PROXY to record and create a test for different thread groups.
- 2) Used below thread group configuration in this use case.
  - 1 user 1 loop 1 sec ramp up
  - 50 user 1 loop 1 sec ramp up
  - 50 user 10 loop 1 sec ramp up
- 3) Performance results for each of this configuration is as below
- 1 user 1 loop 1 sec ramp up
  - response time **269ms**
  - throughput **3.7/sec**

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## ➢ 50 user 1 loop 1 sec ramp up

• response time - 5225ms

• throughput – 4.2/sec

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- 50 user 10 loop 1 sec ramp up This should generate 500 api requests internally but it stops and hangs at 250 api requests with total requests > 3000. May be 3000 requests is the threshold point for 1 machine with 8 GB RAM
  - response time 7261ms

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Use Case 2 – Measure the performance of API response time and throughput using direct api call without using GUI.

- Api end point
- How to get the API with headers and auth tokens
- 1) Go to web application on Chrome
- 2) Login with user name/ password

- 3) Chrome settings -> More tools -> Developer tools -> Network
- 4) User will see all the api service calls as one highlighted in yellow. Right click and copy the curl cmd for the service call. It will look something like below.

curl "endpoint?id=d80951aa-82af-4b8a-959d-05e2e20944a9" -H "Accept-Encoding: gzip, deflate, sdch, br" -H "Accept-Language: en-US,en;q=0.8" -H "User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/52.0.2743.116 Safari/537.36" -H "Accept: application/json, text/plain, \*/\*" -H "Referer: web application" -H "Cookie:

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- Postman tool Initial call it takes 659ms and subsequent requests is 381ms.
- ↓ Jmeter tool to test individual end point api call to measure performance
- 4 You can also parameterize the username and password in the request parameters.
- ➤ 1 user 1 loop 1 sec ramp up
  - response time 485ms
  - throughput 2.1/sec
  - 50 user 1 loop 1 sec ramp up
    - response time 1018ms
    - throughput 22.1/sec
- ➢ 50 user 10 loop 1 sec ramp up
  - response time **1557ms**
  - throughput **29.6/sec**

### Anem Rama R; International Journal of Advance Research, Ideas and Innovations in Technology

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# 2. CONCLUSION

Following above discussed criteria helps select best performance testing software/ tool for your requirement. And by selecting appropriate tool improves the productivity, optimization and scaling.

# **3. REFERENCES**

- [1] https://jmeter.apache.org/
- [2] https://www.soapui.org/load-testing/reference/loadtest-window.html
- [3] https://artillery.io/docs/getting-started/