

Performance Testing: Analyzing Differences of Response Time between Performance Testing Tools

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Abstract

This research focuses on the study and evaluation of response time differences given by three tools used for performance testing. The motivation for this research work is to understand the behavior of various performance testing tools towards determining the accuracy of the response time result. It is conducted with the aim of demonstrating and proving that differences of response time do exist between different tools when conducting performance test for the same webpage as well as analyzing the reasons behind that situation. A static HTML webpage is put under load test for 1, 100, 200, 300, 400 and 500 concurrent users performed by the three tools. The findings clearly showed that different performance testing tool gave different response time when conducting load testing on same webpage. The findings are also supported with the justification for these differences, which involve architecture and simulation mechanism of the respective tool. The summary and future work is presented at the end of the research.

1. Introduction

Performance testing is one of the test strategies performed for the software under test, usually at system testing level. By conducting this test, we could assess the readiness of the software system in handling users' loads thus ensure it could response within an acceptable time range as expected by the end users. This type of testing becomes more crucial if it involves heavy integration with other external systems since performance degradation might take place. Ignoring performance test means that your system is not fully tested, especially from the risk and operational profile perspectives.

The trigger point to embark on this research is driven by real experiences as independent testing team in dealing with various issues, difficulties, challenges as well as successes in doing performance test. These involve conducting performance test for various type of software: standalone, web services, web application, mobile application as well as grid and cloud applications. Suitable and correct approach or strategy of performance test need to be put in place for software so that performance defects can be fixed and the test results are accurate. Thus, the selection and use of right testing tool for performance test is very crucial to achieve this target. This is where the issues start to come into picture.

Several issues have been observed related to tools when conducting performance testing such as tools compatibility with the software under test, tools installation, tools setup, tools flexibility in doing test both for client and server side and also the one that becomes the focus of this research, which is response time generated by the tools.

The research problem falls into area on demonstrating and proving that the response time for conducting performance test for the same website is different when using different performance testing tools. In addition, the research also suggests potential reasons or root cause behind these differences. This work tries to answer the question on "Why do different performance testing tools produce different response time that are not even closed to each other?"

The research discussion is organized into several sections. Section II discusses the prior related works on webpage response time and calculation of response time. Section III outlines the overview of the common features of the testing tools used for the experiment. Section IV describes the environment setup while Section V drills down further on discussing and elaborating the findings of the experiment. Section VI concludes the overall research together with recommendation for future works.

2. Related Works

Most previous work on performance testing tools comparison ignored on different result reported by each tools [1][2][4][5][7][8][9][10][11][12]. VCAA[1] uses pricing and user friendliness as a criteria to