Manual and Automation Analysis of Load Testing

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Abstract—*In today's world, organizations are heading towards the technological era, where most of the work is done technically rather than manually. Softwares are the core part of the technology, due to which there processing needs to be correct as required. We need what is the expected output from these softwares should be the actual output under all the circumstances. Therefore, software testing is the integral part of the technology. Organizations have many arrangements to check the softwares whether they are able to work under the heavy load but manually the load could not be provided accurately because it is not necessary that all the users log into the application at same time ,so here in this paper we are providing a manual as well as the automation testing of the live application using tools. In this research paper, we will be providing virtual users to the live applications and then examine its performance and logs. We will be using some tools that will help us examine the exact processing of the application and then we can compare it with the manual testing.*

1. INTRODUCTION

Effective functioning of the modern system depends on the ability to produce cost effective software products. Many systems are available all over the world-wide whose infrastructures must support the random and the concurrent access of the multiple users. Sometimes, when applications is working live and hundreds, thousands or millions of users access that particular application then the error occurs as it unable to support bulk users. It happens due to, when the software/application providers do not properly load test or create enough resources to carefully deal with the heavy traffic. Unlike testing the functionality of the system i.e., unit testing, integration testing, system testing which does not depend upon the number of users, load testing deals with the large number of users hitting at the same time. Therefore, it can last to no. of hours to no. of days.

The load testing process that is carried out is divided into the following steps:

- SYSTEM ANALYSIS
- USER SCRIPTS
- SETTINGS
- PERFORMANCE MONITORING
- ANALYZING RESULTS

Hence, we can say load testing is the measure of the entire web application / software's ability to sustain a large number of users and transactions.

Basically, there are two methods to carry load testing.
- MANUAL TESTING
- AUTOMATION TESTING

Manual Testing, as the name suggests is the testing that is done manually by the testers or developers or the clients. Whereas, automation testing deals with the related tools that help in testing the application after the settings are done. Due to the iterative nature of the load testing manual testing is not very beneficial or practical in nature that is why now in the present world most of the organisations are heading towards the automation testing of an application.

2. RELATED WORK

In the research paper by Zhen Ming Jiang, he proposes an automated analysis of load testing. In his work he starts by recording the execution logs and performance metrics. He performs the functional analysis and performance analysis under the load test. His approach is based into 3 steps: Firstly, abstracting the log line execution and performance metrics into performance metrics. Then, functional models are generated to uncover functional problems.Lastly, the automated evaluation of performance metrics is done. Therefore, in this paper the author has done whole working related to functional and performance testing through automation tools.

Kartheek Muthyala, Rajshekhar Naidu presents a novel approach where both testing and data mining domains are combined. They proposes the technique in which all the test cases are generated and load testing is done manually. After creating test cases they are parsed using data mining techniques.

Jorge Vizcaíno, in his paper has created a model through which the traffic system could be tested for machine to machine communication. It was also made possible to increase

the number of servers thus increasing the number of instances in this script.

Niclas Snellman, in his research paper shows performance and scalability analysis in rich internet applications (RIA) through automation tools. In this proposed approach there is no requirement server-side monitoring or any server modifications. First the ASTORIA framework is build of RIA and then performance testing is done.

Diplom-Ingenieur, George Din, in their paper discusses about the telecommunication applications. In such applications it is hard to analyse the performance of the application. So they proposed a methodology that copes up with the mentioned characteristics.

3. PROBLEM STATEMENT

As we are aware with the fact that testing is most renowned and important technique that is used in every organisation be it related to e-commerce, telecommunication, etc. Therefore, testing is the process of executing a program in order to find the relevant errors that could be solved as soon as possible. But when it comes to the load testing where we need to check whether an application is supporting a bulk of users than the problem occurs to how to get it tested. Because conducting such tests manually is possible but not accurate neither could be performed at a definite time.

Thus, in this system we are building a model where a live application testing will be carried forward. The problem occurs while the manual testing is performed because at the same number of users cannot hit the same application there will occur a minute difference in the login timings.

Here we will perform both the manual as well as the automation testing. Manual testing will be performed by the users, whereas, the automation testing will be performed by the virtual users via. load generators. And after both the testing will be performed we can compare in the results of the accuracy. Because when it comes to the load testing the performance and functionality could only be accessed correctly using automated tools.

4. OUR APPROACH

Our approach consists of the following steps:

- Prepare the requirements of the application that is needed to be tested.
- Create the test plans required for the test case generation.
- Test cases are generated and their execution is done accordingly
- Results are tabulated according to the expected and the actual output.

The above steps are to be followed first through manual testing i.e. users/ testers and then through the automated tools.

4.1 MANUAL ANALYSIS

The testing techniques that are followed during the test cycle during testing manually are,
- White box testing
- Black box testing
- Unit testing
- Integration testing
- System testing
- Acceptance testing

In this technique the tester takes over the role of end users and makes the application/ software defect-free.

First and foremost, the test plans are generated for the testers to ensure the completeness of the testing. The test cases are generated manually without any involvement of the automated tools.

Then accordingly tests are PASS OR FAIL based on the user analysis. The failure or defect is categorised under the medium, average, high or very high category.

The failure where occurs a bug report is attached to it so as to let other team members or team lead to go through the bug that was encountered by the tester.

4.2 AUTOMATED ANALYSIS

It is the process in which the pre-scripted tests are executed using the software tools based on software application. Automation analysis helps in minimising the sets of the scripts so as to simplify the tests. These tools are capable of executing tests, reporting results and comparing results with expected and output. These processes can be done repeatedly any day any time.
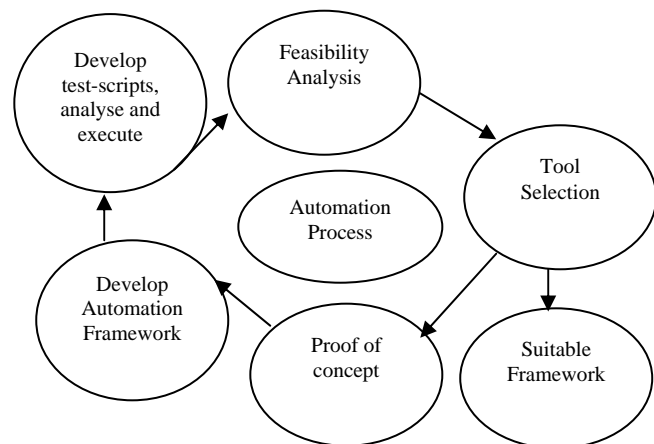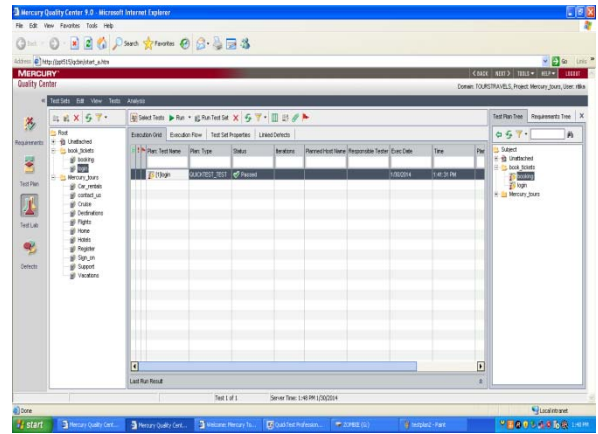


{AUTOMATED TESTING PROCESS}
First we test the application using Quality Centre.
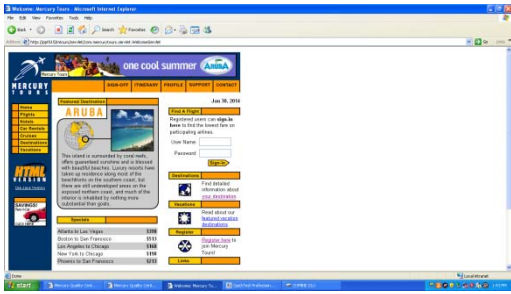
The requirements are added in this tool, then the test plan is created where test scripts are generated and lastly in the test lab the test scripts run. Based on which the results are tabulated.
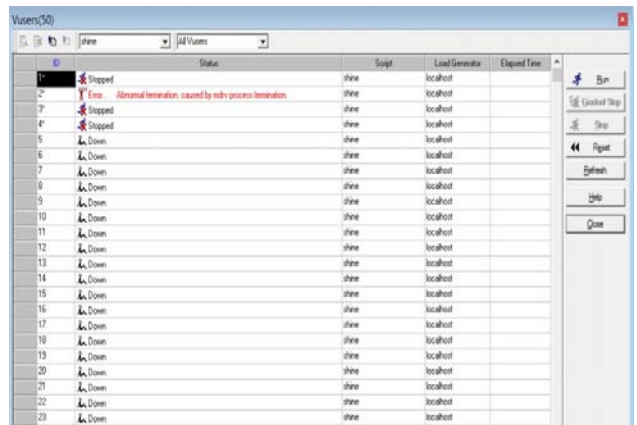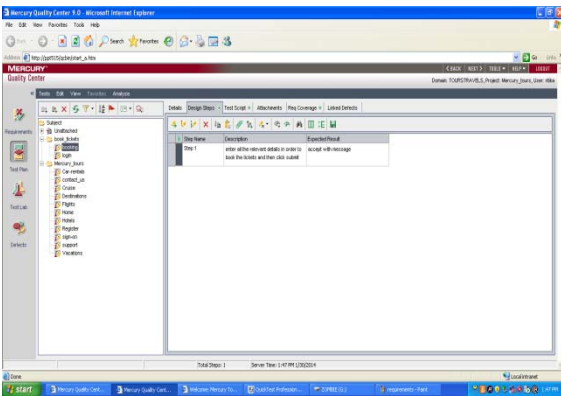

The above figures show the functioning of the Quality Centre that runs in co-ordination with Quick Test Professional.
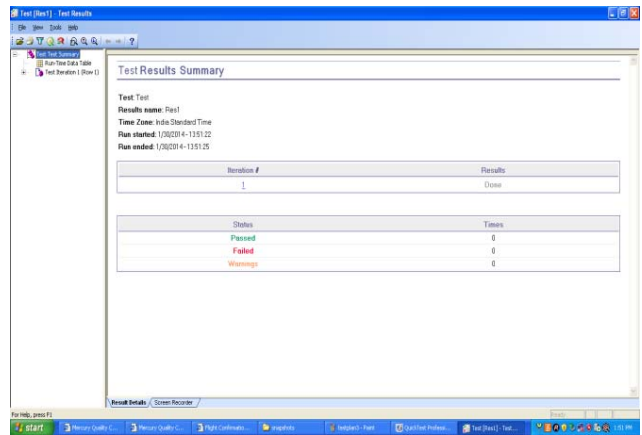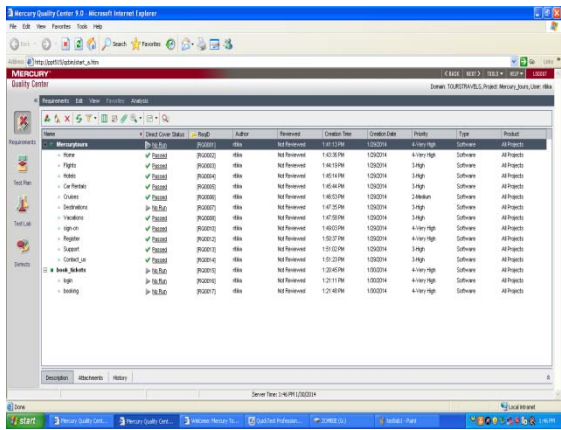
The following result is generated.

Now the virtual users are provided using LoadRunner.

Hence through this we can check out that how much users at a time can hit the application and how many couldn't. Therefore, this technique is much more precise and accurate for load testing than manual testing.

5. CONCLUSION

As in this research paper we have used both the techniques for the load testing i.e. through testers manually and through automated tools also where the virtual users are provided. Hence, we can see the difference between the results of both the techniques. As automated testing should be used in all the fields so as to check the applications. Because now most of the work is conducted through softwares or application be it in any field. So it should be checked that whether it is supporting the traffic that will be available in the future use.

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