

Comparative analysis of automated website testing tools

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Abstract

The purpose of this project is to perform comparative analysis on the automated websites testing tools available today. The objective of this project is to conduct a comparative analysis of these automated tools by practically testing some of the most using websites. The analysis is based on criteria such as the effort involved with the generating test scripts, page loading time response time, user friendliness, robustness (behavior under maximum load) and successfully completing a minimum number of transactions per minute.

I PROBLEM STATEMENT

The purpose of an Internet or Web-based application is to make a company message, or an on-line interaction, available to an audience external to or throughout the enterprise. Additionally, Web-based technology allows the implementation of a system with a thin client (the Web browser), while the complex hardware, application software, and data supporting the application remains centralized rather than distributed.

Hence it is required to have an efficient and error free websites. But how we will measure the correctness of the websites?

Now, automated website testing tools plays a vital role in today' hi - tech world. They help in increasing the efficiency of the websites.

II BACKGROUND AND RELATED WORK

Testing is important in the development of complex business processes and software testing is a labor intensive task. The choice (Manual Testing tool or Automated Testing tool) depends on a number of factors such as cost, time etc.some work has been done toward the automated testing tools, but there is still a trade off between a selection of tool and using of tool at various levels like in organizations , institutes etc.

A. Introduction

The testers of the website face many challenges while testing the website, particularly the creation and maintenance of the test script. An application should be

robust against changes and modifications. It is therefore must that automated testing tools build robust scripts.

It would be helpful for testers if the automated testing tools are capable of building scripts that are flexible to changes in the application and it should also notify the tester about some important issues like page loading time, response time, user friendliness and robustness (behavior under maximum load) .Hence for this purpose we used the two testing tools viz : OPEN, System Testing Architecture (O STA) and Web Performance Analyser on some most using websites to test the efficiency of these tools in terms of page loading time , response time and robustness

III METHODOLOGY AND ARCHITECTURE

The testing process starts with the recording and playing back the scripts. This records the action performed by the user for the application under test. During recording, Various commands can be inserted to verify if the application works as intended. Finally, the script can be played back to replay the user actions. The steps followed in the testing process are shown in Figure 1. [2]

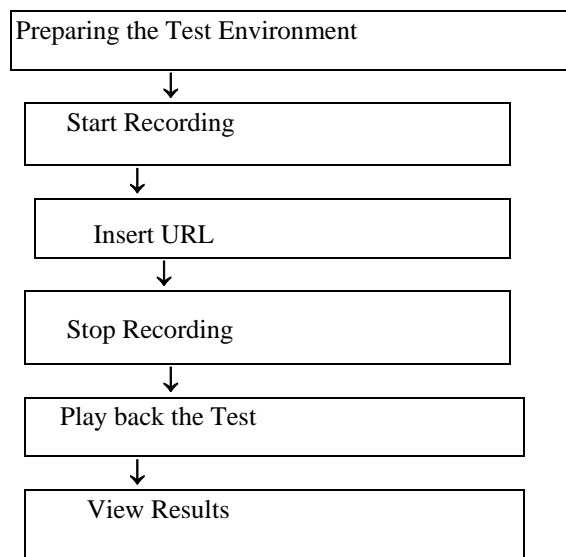


Figure1.Steps of recording/playback the test

A. Preparing The Test Environment

To get accurate results, Web testing should be performed on a dedicated network that is isolated from other traffic.

Likewise, the server should not be accessible by other users or be performing other tasks during the test. The browser should be enabled before recording to test HTML applications.

The Web Performance Analyzer comes with the Internet explorer as the default browser.

The O STA tool uses Internet explorer as well as mozilla firefox browsers, with this tool browser is enabled before recording and a URL is provided for testing the html application

B. Start Recording

The Recording monitor will generate statements for actions such as keystrokes and mouse clicks performed by the user.

The Web Performance Analyzer has the recording monitor to record the user actions. The recording monitor contains buttons for inserting commands.

The O STA tool has a test pane. It generates statements for actions performed by the user.

C. Insert URL

After recording the test is generated by inserting the URL of the website which is to be tested. In Web performance analyzer URL is inserted after pressing recording button.

In O STA tool first script is generated then browser is enabled then on pressing the record button, URL is inserted

D. Stop Recording

After recording, the scripts are generated in the editor and the graphical objects in the application are stored in the object map/repository.

Scripts are Java or VB statements executed in standard environment.

By pressing stop button recording can be stopped.

E. Play Back The Test

When the script is played back, it replays the user actions performed during recording. After playback, the results are generated in the test results window. It shows the variation between the two tests.

IV IMPLEMENTATION AND ANALYSIS OF WEBSITE TESTING TOOLS

A. Creating a Test case

A test case is a specific sequence of user-initiated application actions (including navigation, data entry, queries, etc.) that define the operation to be simulated. The test cases are created differently in each tool, but they generally fall into two categories:

i) Create a script by entering the URLs for each page in the use case and provide all the necessary parameters for each URL (including form fields)

ii) Recording the test case interactively using a browser.

Most tools allow the latter - which is by far the quickest way to create a test case

For the analysis we use the yahoo.com as our test case and then analyze the different parameters like page duration, page / sec, hits / sec, errors, bytes /sec,

B. Establishing A Baseline

For load testing of website, it is wise to evaluate the performance of application for a single user. We refer to this as the baseline performance of the system - it defines the standard against which the load test results should be evaluated. . The performance of a system under load will never be better than the baseline performance, so if the system is not performing at the desired level with a single user, we should solve that problem before moving on to load testing. We configured a performance goal for page response times of <3 seconds. [3]

C. Analyzing Results

(i) Web Performance Analyzer

First Web Performance analyzer is used to test the test case (i.e. yahoo.com).we use 10 virtual users and test duration is of 2 minutes .after testing following results are drawn.[4]

a) Page duration (Fig.2)

b) pages/ sec (Fig.3)

c) hits / sec (Fig.4)

d) Errors (Fig.5)

e) Bytes/sec (Fig.6)

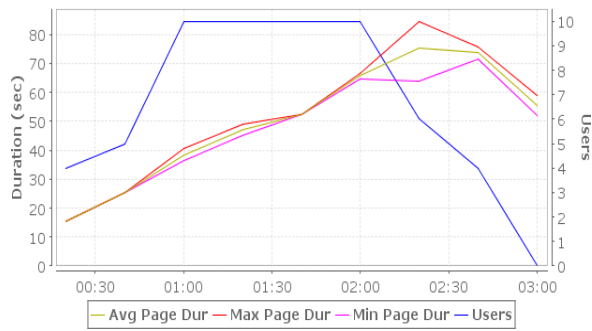


Fig 2 Page_Duration

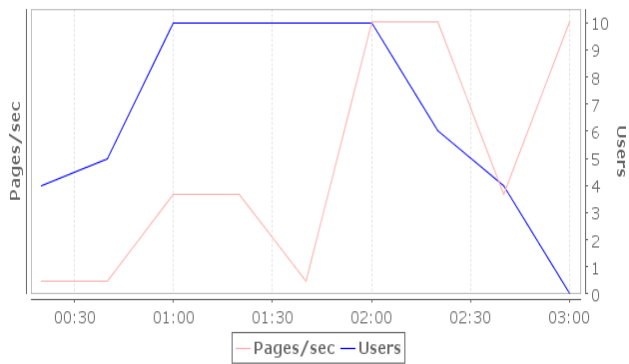


Fig 3 Pages / sec

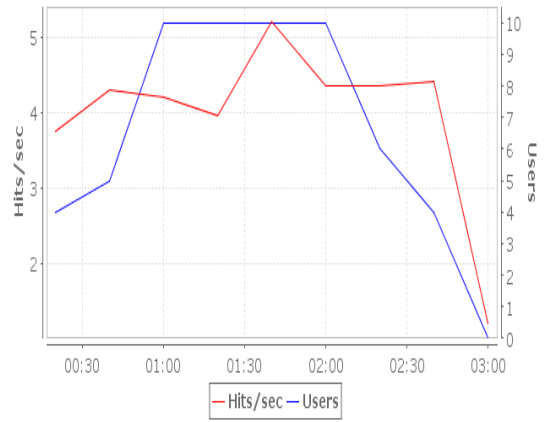


Fig 4. Hits / sec

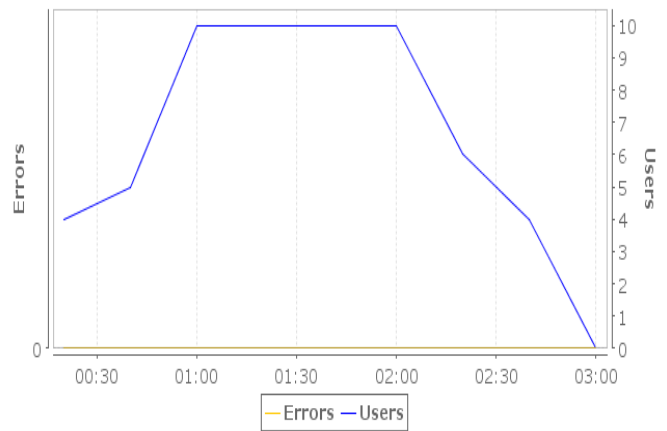


Fig 5. Errors

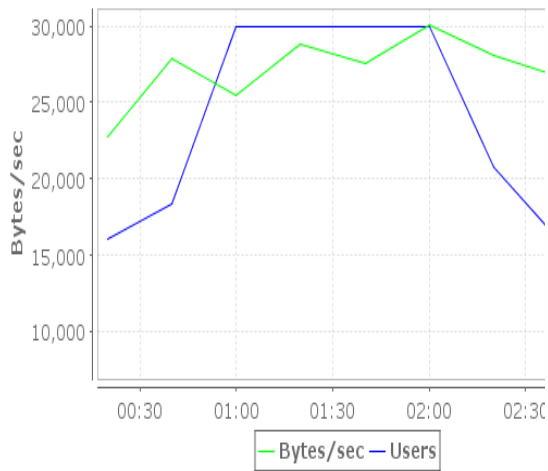


Fig.6 Bytes/sec

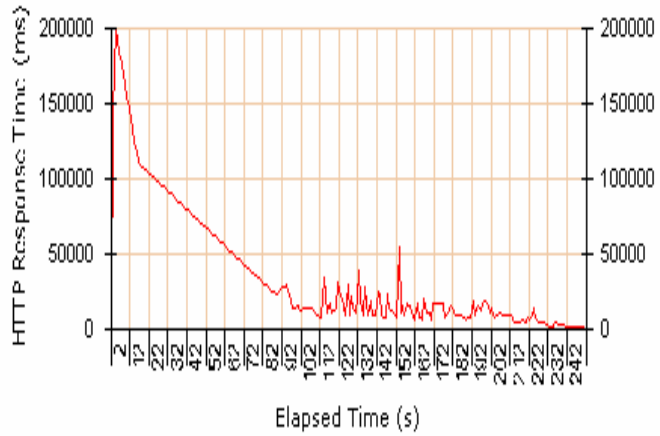


Fig 8 Response time vs Elapsed time

(ii) Open STA suite

O STA tool is used to run four tasks with 10 virtual users(total 40 active users) each with the same test case(i.e. yahoo.com).Test summary is as follows. [5],[6]

Now the Comparison of both these tools based on above criteria are rated as shown below and given in the table.

- Excellent
- Very Good
- Good
- Satisfied
- Unsatisfied

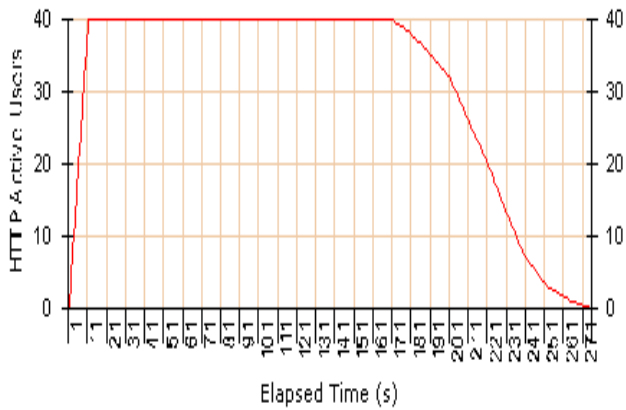


Fig 7 Active users vs Elapsed time

D. Results

S.NO	Criteria	Web Performance Analyser	O STA suite	Reason
1	Generation of Scripts	Excellent	Very good	Web performance analyzer is capable of Generating VB scripts and java scripts. It is eclipse based STA generates only Java scripts
2	Page duration	Excellent	Good	Web performance analyzer shows the Page duration / sec in the form of graph. O STA shows page duration in text report
3	Playback of the test	Excellent	Good	User actions performed during recording are replayed during playback. Playback is much easier in Web performance analyzer than O STA
4	Feature to add variables and accommodate changes	unsatisfied	Excellent	In web performance analyzer new variables can not be added but we can add new variables in O STA
5	Cost	Good	Excellent	O STA is cheaper than the web performance analyzer tool
6	Test Results and user friendliness	Excellent	Good	Test results are displayed as html/text and as well as in graph format and are easy to use in web performance analyzer better than O STA
7	Load testing	Excellent	Good	Load testing can be performed at the finest level in Web performance analyzer than the O STA

V CONCLUSIONS

The project successfully evaluated the two tools and verified the expected behavior of the application.

The web performance analyzer should be modified to accommodate changes.

If the application may change at the latter stage then there should be a provision to add new variables and modify the scripts

In OSTA tool medications should be performed on result pane. There should be a generation of graphs like page duration and pages/ sec .work should be done to make it more user friendly and to perform load testing effectively.

Hence different organizations and institutes can use above tools according to their requirements with the help of this paper

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