Comparative Study of Different Cloud Testing Tool

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Abstract: **Cloud testing is a subset of software testing in which simulate, real-world web traffic is used to test cloud-based web applications. Cloud testing also verifies and validates specific cloud functions, including redundancy and performance scalability. Ultimate aim is to conduct a comparative study of performance testing tools (Load Runner and JMeter) for cloud based applications based on criteria such as capability to play the script, result report, speed and cost of selection of best tool.**

Keywords: **Cloud testing, Performance testing, Apache JMeter, HP Load Runner.**

1. I. INTRODUCTION

Cloud Testing uses cloud infrastructure for software testing. Organizations pursuing testing in general and load, performance testing and production service monitoring in particular are challenged by several problems like limited test budget, meeting deadlines, high costs per test, large number of test cases, and little or no reuse of tests and geographical distribution of users add to the challenges. Moreover, ensuring high quality service delivery and avoiding outages requires testing in one's datacenter, outside the data-center, or both. Cloud Testing is the solution to all these problems. Effective unlimited storage, quick availability of the infrastructure with scalability, flexibility and availability of distributed testing environment reduce the execution time of testing of large applications and lead to cost-effective solutions. Benefits of Cloud Testing: Dynamic availability of environment, Low cost, easily customizable, Scalability.

Software performance testing is a means of quality assurance (QA). It involves testing software applications to ensure they will perform well under their expected workload. Features and Functionality supported by a software system is not the only concern. A software application's performance like its response time, do matter. The goal of performance testing is not to find bugs but to eliminate performance bottlenecks. The focus of Performance testing is checking a software programs: Speed - Determines whether the application responds quickly, Scalability - Determines maximum user load the software application can handle, Stability - Determines if the application is stable under varying loads.

Performance testing is done to provide stakeholders with information about their application regarding speed, stability and scalability. More importantly, performance testing uncovers what needs to be improved before the product goes to market. Without performance testing, software is likely to suffer from issues such as: running slow while several users use it simultaneously, inconsistencies across different operating systems and poor usability. Performance testing will determine whether or not their software meets speed, scalability and stability requirements under expected workloads. Applications sent to market with poor performance metrics due to nonexistent or poor performance testing are likely to gain a bad reputation and fail to meet expected sales goals. Also, mission critical applications like space launch programs or lifesaving medical equipment's should be performance tested to ensure that they run for a long period of time without deviations.

The research has been organized into different sections.
Section I: Introduction
Section II: Overview of tools that are used for comparison
Section III: Result of these tools are discussed and analyzed
Section IV: Conclude the overall work

2. II. OVERVIEW OF TOOLS THAT ARE USED FOR COMPARISON

A. JMeter

JMeter is an Open Source testing software. It is 100% pure Java application for load and performance testing. JMeter is designed to cover categories of tests like load, functional, performance, regression, etc., and it requires JDK 5 or higher. This tutorial will

give you great understanding on JMeter framework needed to test an enterprise level application to deliver it with robustness and reliability.
JMeter is a software that can perform load test, performance-oriented business (functional) test, regression test, etc., on different protocols or technologies. Stefano Mazzocchi of the Apache Software Foundation was the original developer of JMeter. He wrote it primarily to test the performance of Apache JServer (now called as Apache Tomcat project). Apache later redesigned JMeter to enhance the GUI and to add functional testing capabilities. JMeter is a Java desktop application with a graphical interface that uses the Swing graphical API. It can therefore run on any environment / workstation that accepts a Java virtual machine, for example − Windows, Linux, Mac, etc.

The protocols supported by JMeter are:

1. Web − HTTP, HTTPS sites 'web 1.0' web 2.0 (Ajax, flex and flex-ws-amf)
2. Web Services − SOAP / XML-RPC
3. Database via JDBC drivers
4. Directory − LDAP
5. Messaging Oriented service via JMS
6. Service − POP3, IMAP, SMTP
7. FTP Service

B. Load Runner

Load Runner is a Performance Testing tool which was pioneered by Mercury in 1999. Load runner was later acquired by HP in 2009. Load Runner supports various development tools, technologies and communication protocols. In fact this is the only tool in market which supports such large number of protocols to conduct performance testing. Load Runner is not only pioneer tool in Performance Testing, but it is still market leader in the Performance testing paradigm. In a recent assessment, Load Runner has about 85% market share in Performance Testing industry. It used to test the applications under normal and peak load conditions. Load runner generates load by creating virtual users that emulate network traffic. It simulates real time usage like a production environment and gives graphical results. There are different component of load runner

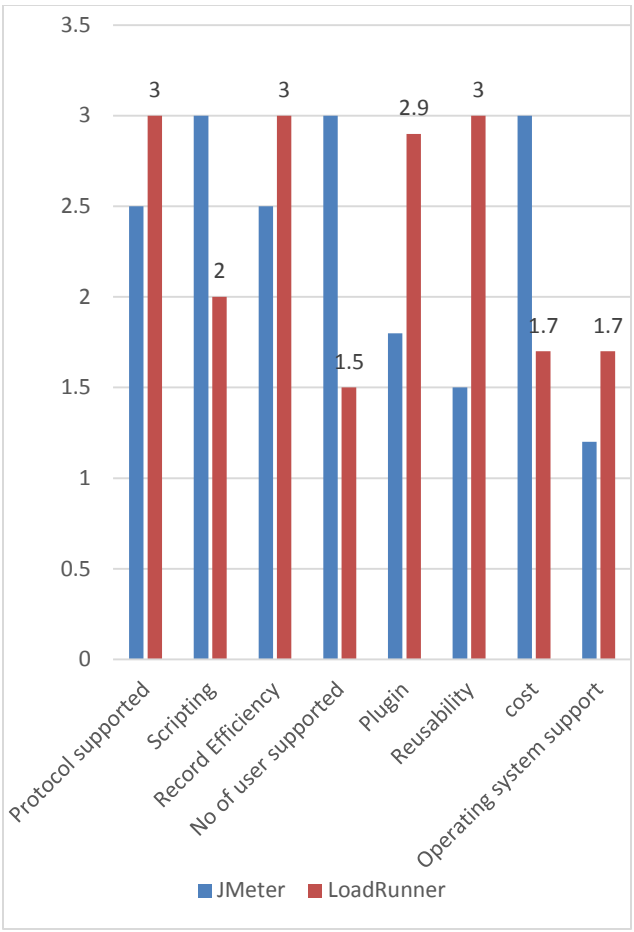
- **VUGen:** VUGen or Virtual User Generator is an IDE (Integrated Development Environment) or a rich coding editor. VUGen is used to replicate System under Load (SUL) behavior. VUGen provides a "recording" feature which records communication to and from client and Server in form of a coded script - also called VUser script.
- **Controller:** Once a VUser script is finalized, Controller is the main component which controls the Load simulation by managing. The Controller has two sections: Design Section – This is used to design the load testing scenario. Run Section – This is used to monitor scenario which are in execution.
- **Analysis:** The executed script result is displayed in the analyzer. Analyzer section is used to observe reports and graphs, it would determine the performance of our recorded scenarios at different user load.

3. III ANALYSIS OF TOOLS

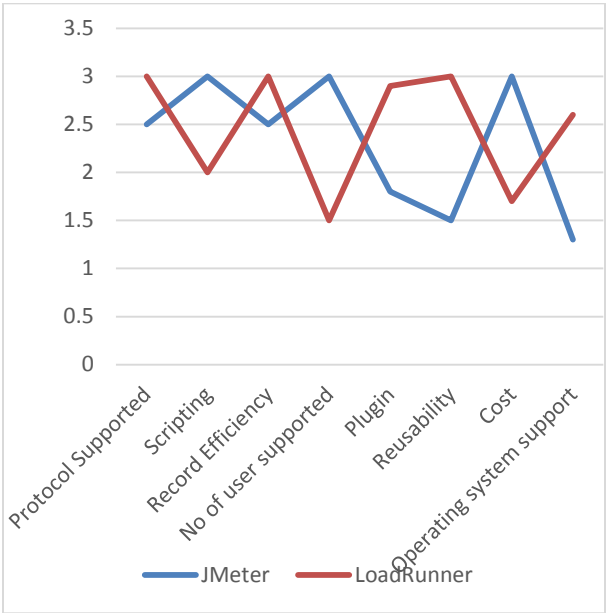
Parameters	**JMeter**	**Load Runner**
Protocols supported	Supports a lot of protocols out-of-box and via plugins (HTTP(S), LDAP, JDBC, JMS, SMTP, POP, etc.)	It support large number of protocol as compare to jmeter like(Ajax Protocol, Ajax TruClient, RDP Protocol,RTE Protocol, SAP Protocols, Siebel Web Protocol, Silverlight Protocol, Tuxedo Protocols, Web Protocols, Windows Sockets Protocol, Wireless Protocols)
Scripting	It can be extended via Bean shell scripting, JavaScript, Groovy, Java, etc.	It supported java Script and c as a scripting language.
Recording	JMeter records	Load Runner

efficiency	the user actions as they are performed and then exports them as reusable script in java programming language. It's possible to execute the Recorded script to any browser.	script code obtained from recording in the ANSI C language syntax, and also support the playback feature.
Number of virtual users supported	JMeter has an unlimited load generation capacity.	Load Runner has a limited load generation capacity.
Plugin	Java plugin	SDK
Reusability	Support	Support
Cost	Jmeter is an open-source and there's no licensing or renewal cost for this tool. It's free of cost.	HP Load Runner is available through single-seat licenses, as well as floating or concurrent licenses.
Operating systems supported	JMeter is a 100% Java application and should run correctly on any system that has a compliant Java implementation. Like windows, Linux, mac etc.	Load runner support Microsoft Windows (server parts require ASP.NET) Performance Center requires several Windows Servers. Unix/Linux for load-generator is supported though.

Graphical Representation



Line Representation



4. IV.CONCLUSION

This study set out to explore, classify and compare the performance testing tools. This study helping in the suitable tools based on multiple criteria. The tools are compare on the bases of some parameters like cost, record efficiency, plugin etc.in some cases like cost and no of user supported meter is good performance testing tool but the script generating and playback feature of jmeter is not as strong as loadrunner.Loadrunner is licensed based tool so it is costly then jmeter but its support more protocols as compare to jmeter and it is also generate control and analyze the script but the analyze and control feature is not available in jmeter. So based on the study I analyzed that load runner is better than jmeter.

REFERENCES

[1] G. Gowrie; M. Martha; "Cloud Computing Application and their Testing Methodology", International journal of Innovation Research in Computer and Communication Engineering. (vol. 2, Issue 2, fib 2014)

[2] Remit Kumar; Sorbet Singh, "Cloud Testing: Perspective and Challenges", International Journal of Computer Application" (Vol. 106 No.17, Nov 2014).

[3] Mama Sharma and Dirges Srivastava, "Software Testing in Cloud Computing Environment", International Journal of Advanced Research in Computer Science and Software Engineering (Volume 4, Issue 6, June 2014).

[4] Akashi Srivastava; Shubham Gupta and Rinki Tiwar, "Cloud based Testing Technique", International Journal of Computer Application" (Vol. 104 - No.5, Oct 2014).

[5] G. Candea, S. Bucur, and C. Zamfir, "Automated software testing as a service," In the 1st ACM symposium on Cloud computing (SoCC '10), 2010.

[6] Ciortea, etal, "Cloud9: a software testing service,"ACM SIGOPS Operating Systems Review, vol. 43, no. 4, January, 2010

[7] Ganon, Z.; Zilbershtein, I.E. (12 June 2009). "Cloud-based Performance Testing of Network Management Systems". Computer Aided Modeling and Design of Communication Links and Networks: 1–6. Retrieved 12 October 2011.

[8] Banzai, Takayuki; Koizumi, Hitoshi; Kanbayashi, Ryo; Imada, Takayuki; Hanawa, Toshihiro; Sato, Mitsuhisa (17 May 2010). "D-Cloud: Design of a Software Testing Environment for Reliable Distributed Systems Using Cloud Computing Technology". Cluster, Cloud and Grid Computing (CCGrid), 2010 10th IEEE/ACM International Conference: 631–636.

[9] Y. Chen and X. Sun, "STAS: A Scalability Testing and Analysis System," in IEEE International Conference on Cluster Computing, 2006.

[10] Vandana Chandel et al. " Comparative Study of Testing Tools: Apache JMeter and Load Runner" International journal of computing and corporate research"VOLUME 3 ISSUE 3 May 2013

