

## CASE STUDY:

### Transition from Load Runner to JMeter: Cost Benefit without Feature Compromise

April: 2014

#### **Client:**

Client is a leading provider of innovative solutions in e-learning industry. They have been serving and delivering content, digital information services and course-driven training programs for instructors, students and other academic bodies that has transformed the learning experience.

#### **Problem Statement:**

To move from a costly licensed tool to a less expensive solution yet competitive solution for performance testing (of web based application). This transition was needed to cut licensing costs of the performance testing tool.

#### **Challenge:**

Our biggest challenge was to select the right tool to design and measure performance of the web application and then to migrate the existing performance testing activities to the new solution taking into account all of the requirements of our client.

#### **Solution:**

To arrive at an optimal solution, we decided to migrate the performance testing activities for the application to an open source tool without impacting the quality of the results and analysis provided to the client.

Our first step was to decide on the right tool that would replace Load Runner. Selection of the right tool ensures saving not only valuable time but also money. In order to shortlist the right tool, the following aspects were taken into consideration:

1. Ease of coding and execution
2. Accuracy of the results - This is one of the most important aspect because if the results obtained from the performance test using the tool are not accurate then end user may face performance issues even after strict performance validation. It would defeat the whole purpose of the executed test run.

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3. Concurrent number of users that the tool can support
4. Flexibility in usage - This includes the availability of inbuilt functions in the tool
5. Results and Graphs provided by the tool - Results should be accurate, meaningful and easy to interpret
6. Feedback available on online forums
7. Frequency of upgrades
8. Mode of replay
9. Ease of learning
10. Ease of script migration from Load Runner to the new tool to avoid rework
11. Tool compatibility with Window's server
12. Skill Set Required - We need to consider the skill set of testers who would be working on the tool. Do they have required skills to learn and work on the tool? If not, we have to account for a training plan to train them. The training cost should also be considered while comparing various tools
13. Support available for the tool - Does the tool have an active support community?

On the basis of the above features' analyses, we shortlisted Pylot, Grinder, OpenSTA and JMeter. The next step was to further examine the shortlisted open source tools and take on a feasibility study.

As Pylot required using a new language Python, we decided it would take time to ramp up on it. More importantly, the tool was not efficient for 'https' based applications, which forced us to yank it off the shortlist.

Similarly, Grinder requires the tester to understand python language, thus time to implement (from a hardware, installation and required people skill perspective) was more. Moreover, it does not offer impressive monitoring solutions and in-depth diagnostic capabilities. So, it was not a feasible option to take up.

In OpenSTA we had to write our own functions for correlation, content check etc. JMeter in comparison did not need any functions to be written for these basic features, when compared to OpenSTA. Also, if you shell out the software as a binary, you must also supply the source code to the people you distributed it to. This will also include any modifications you made to the source code.

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**Apart from JMeter being Open Source and free we found the following additional advantages:**

1. Support and community for JMeter is very active when compared to Load Runner or any other open source tool. Response to the questions and fixes to the bugs are provided very fast. JMeter is Java based and easy to learn. Java being platform independent, the tool is cross platform execution ready
2. JMeter is based on simple record, customize and playback concepts. Thus, testers are not required to write functions for basic features such as content check and correlation
3. As GUI is very user friendly, recording application sessions and executing them is very easy. Third-party Amazon image for cloud-based testing is also available
4. JMeter has the ability to distribute the generation of load across multiple load-injector machines (i.e. JMeter supports multiple load-injectors managed by a one controller)
5. HTTP header cookies are managed automatically in JMeter and can be manipulated manually if required. The communication protocols that can be captured, manipulated and replayed by the JMeter tool are FTP, HTTP 1.0 / 1.1 / HTTPS (SSL), JDBC and JMS
6. JMeter provided capability of setting up an in-house master-slave infrastructure is not very different from Load Runner. JMeter is highly extensible: It's pluggable samplers allow limitless testing capabilities, many load statistics can be chosen with pluggable timers and data analysis. Visualization plug-in allows outstanding personalization along with extensibility
7. In order to meet client expectations, specifically reporting, we were able to churn out custom reporting plugins for JMeter. Easy integration with Jasper Reports and CSV data manipulation helped us create reports that were almost similar to Load Runner reports

### **Final Solution Implementation:**

Once we settled with JMeter as the prospective tool to replace Load Runner, our key effort was to imbibe and evolve an ecosystem to load test the client application. These efforts included:

1. Setting up the master-slave infrastructure in the client location. This was important to meet the client requirement of a high number of vUsers just like Load Runner does
2. Creating plugins for custom reporting. We integrated JMeter with Jasper reports in order to create graphs and tables that target breakpoints
3. Leveraging open source nature of JMeter we created and implemented SNMP plugins to monitor web app server health in real time

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### Cost / Client Benefits:

On moving from LoadRunner to JMeter the annual cost benefits we were able to reap and transfer back to our client are as outlined below:

	Infrastructure	Scripting	Execution (100 users)	Execution (1500 users)
LoadRunner	6 machines	\$150 / hr * 2 weeks = \$12,000	\$33,000	\$55,000
JMeter	6 Machines	\$75 / hr * 2 weeks = \$6,000	NA	NA
Difference	-	\$6,000	\$33,000	\$55,000

Cost for bench mark with Load Runner = \$ 45,000

Cost for bench mark with JMeter = \$6,000

**Reduction in cost = \$ 39,000 (i.e. 87%)**

Cost for peak execution with Load Runner = \$ 67,000

Cost for peak execution with JMeter = \$ 6,000

**Reduction in cost = \$ 61,000 (i.e. 91%)**

Opening the doors to one open source tool may also initiate way to other open source technologies in the project as people will realize the advantages of using open source technologies and will be ready to adopt it. So a small beginning can lead to a major operational change and one transition from licensed tool to an open source tool can eventually save millions in terms of licensing costs. That said, especially in a migration, careful analysis is very important failing which there may be additional overhead, incurred cost and time, bringing down the overall trust in the team's effort. The above case study is a testimony of the kind of analysis that becomes important before a tool migration.

**By Kamaljeet Kaur**

At QA InfoTech (an ISO 9001:2008, 20000-1:2005, 27001:2005 and CMMI Level III certified company), we specialize in providing independent offshore software testing and, unbiased software quality assurance services to product companies, ranging from the Fortune 500s to start-up companies.

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- Mukesh Sharma, Founder & Chief Executive Officer

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