

RTI – Calculating Overhead and Performance Testing



OC Systems provides software instrumentation tools and consulting services that help organizations gain greater visibility into large, complex applications.

The larger and more complex an application is, the more difficult it is to find out what is happening inside, as the application executes.

There are many tools that provide visibility into an application's execution during development, but once the application reaches integration and system test, those tools are too invasive.

OC Systems offers tools and services to provide that visibility in the post-development environment. With these solutions, defects and performance problems that are not discovered until integration can be resolved faster, reducing the risk of slipping the schedule.

RTI is the only root-cause diagnostics and application performance management (APM) software designed specifically for Red Hat's JBoss Operations Network.

Introduction

RTI, a flagship product of OC Systems, provides end-to-end visibility and analysis capabilities specifically for performance engineers and testers. RTI integrates directly with test automation frameworks so users can deep-dive from their automated transactions, diagnose root-cause failure, and quickly resolve otherwise hard-to-find problems.

The Challenge

The challenge was to calculate the performance overhead of RTI application (v 3.4) for Konakart e-commerce server. The goal of the benchmark tests was to measure the following for RTI application

- Response Time overhead
- Throughput overhead
- CPU, Network I/O and Disk I/O overhead

Approach

- The performance tests were done by using HP LoadRunner to generate load.
- LR script, that captured all the possible events/scenarios within the Konakart application, was created
- A load of 120 users (to simulate 120K requests per hour) was generated
- A ramp-up and ramp-down of 40 users per 20 seconds was set in the LR controller
- To measure the overhead of RTI, the tests were run for 4 hours 'with' and 'without RTI'
- Unix performance commands were used to calculate the Server CPU Usage

Test Environment

Three machines were used to set up the test environment

- Intel Xeon Intel Xeon 2.8GHz CPU and 4 GB RAM (Machine 1 and 2)
 - Machine 1: Tomcat Application Server (REDHAT Linux)
 - Machine 2: MySQL Database (UBUNTU Linux)
- Windows XP, 3.0GHz and 4 GB RAM
 - Machine 3: HP LoadRunner

Application Under Test

The Konakart application uses Sun Java 1.6, Tomcat Servlet Container, and a MySQL Database. The application uses a standard JSP/Struts based web programming stack. The architecture of the application is shown in Fig 1

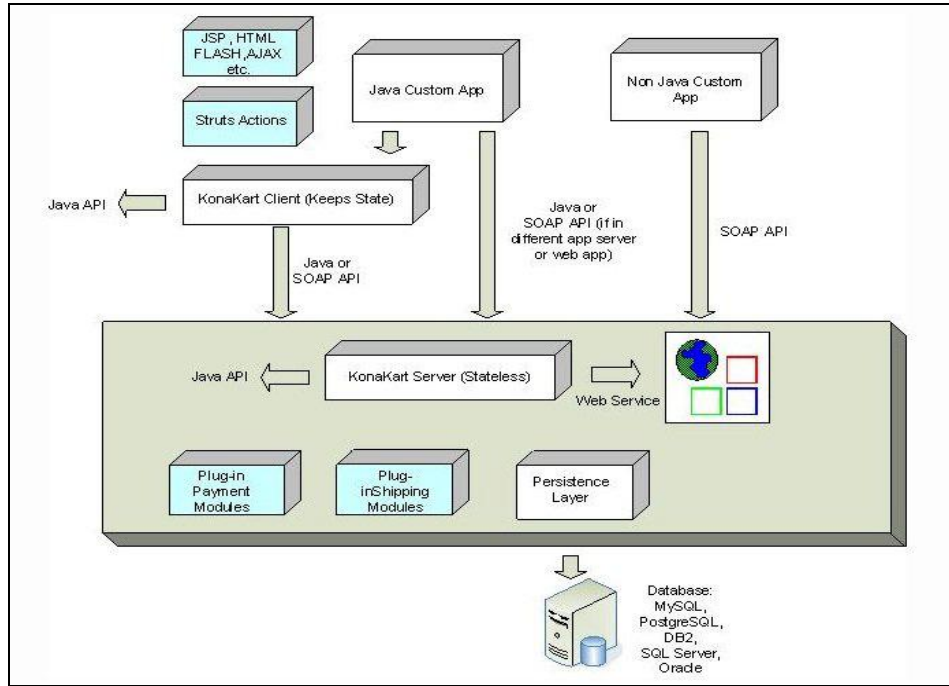


Fig. 1 - Response Time without RTI

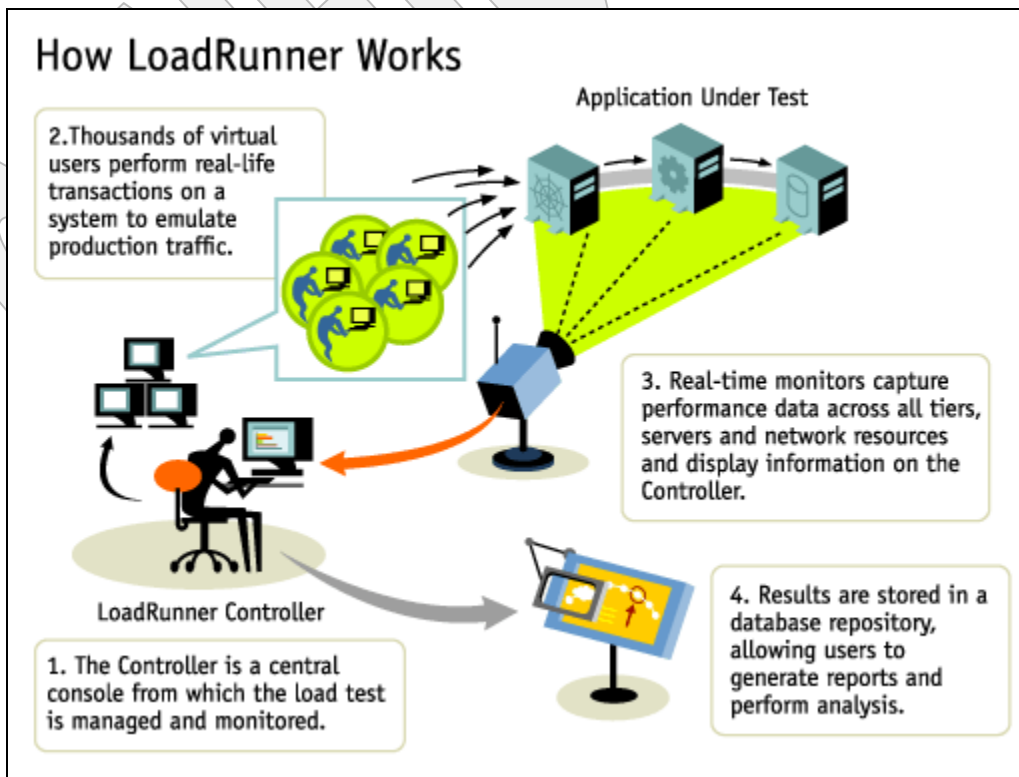


Fig. 2 – loadrunner Architecture and RTI

Performance Results

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
Action_Transaction	532.281	532.481	535.547	0.221	532.638	3,398	0	0
AddToCartSubmit_do	0	0.034	0.125	0.014	0.047	3,398	0	0
EditCartSubmit_do	0	0.007	2.375	0.042	0.016	3,398	0	0
login_do	0	0.007	0.078	0.008	0.02	3,398	0	0
LoginSubmit_do	0	0.013	0.594	0.02	0.023	3,398	0	0
LogOut_do	0	0.017	0.875	0.037	0.031	3,398	0	0
QuickSearch_do	0	0.016	3.031	0.053	0.023	3,398	0	0
Selectcat_do	0	0.041	0.462	0.029	0.063	3,398	0	0
SelectProd_do	0.031	0.106	0.667	0.062	0.172	3,398	0	0
ShowCartItems_do	0	0.006	0.063	0.008	0.016	3,398	0	0
ShowRandomReviewDetails_do	0	0.018	3.094	0.09	0.022	3,398	0	0
ShowReviews_do	0.016	0.036	0.639	0.037	0.052	3,398	0	0
ShowSearchByManufacturerResults_do	0	0.021	2.406	0.048	0.031	3,398	0	0
vuser_end_Transaction	0	0	0	0	0	120	0	0
vuser_init_Transaction	0	0.001	0.007	0.001	0.003	120	0	0
Welcome_do	0.047	0.075	0.547	0.032	0.112	3,398	0	0

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
Action_Transaction	532.281	532.536	535.707	0.2	532.692	3,395	0	0
AddToCartSubmit_do	0.016	0.038	0.242	0.018	0.052	3,395	0	0
EditCartSubmit_do	0	0.008	0.05	0.008	0.021	3,395	0	0
login_do	0	0.007	0.047	0.008	0.029	3,395	0	0
LoginSubmit_do	0	0.019	3.031	0.072	0.031	3,395	0	0
LogOut_do	0	0.018	0.438	0.014	0.033	3,395	0	0
QuickSearch_do	0	0.014	2.969	0.051	0.024	3,395	0	0
Selectcat_do	0.016	0.051	0.891	0.036	0.081	3,395	0	0
SelectProd_do	0.047	0.145	1.156	0.092	0.241	3,395	0	0
ShowCartItems_do	0	0.008	2.984	0.072	0.019	3,395	0	0
ShowRandomReviewDetails_do	0	0.016	0.172	0.01	0.023	3,395	0	0
ShowReviews_do	0.016	0.028	0.141	0.012	0.056	3,395	0	0
ShowSearchByManufacturerResults_do	0	0.02	0.156	0.008	0.031	3,395	0	0
vuser_end_Transaction	0	0	0.016	0.001	0.001	120	0	0
vuser_init_Transaction	0	0.001	0.013	0.002	0.001	120	0	0
Welcome_do	0.031	0.082	0.75	0.036	0.111	3,395	0	0

Fig. 3 - Response Time without RTI

Fig. 4- Response Time with RTI Enabled

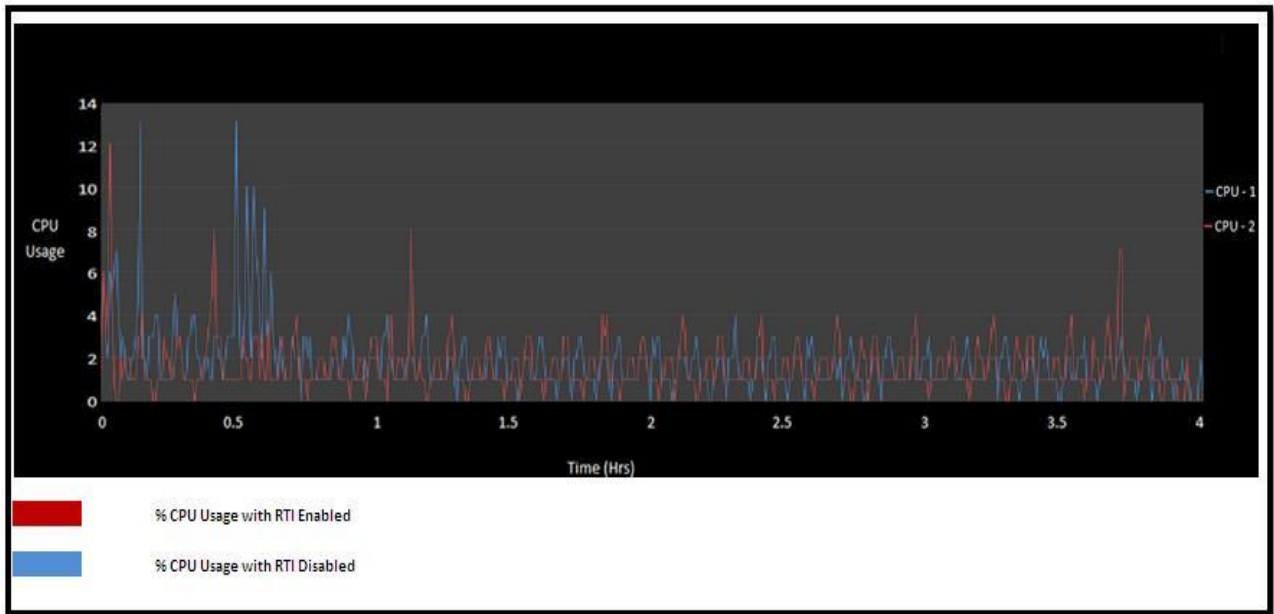


Fig. 5 - CPU Utilization with and without RTI

Critical Success Factors

- Close coordination with the RTI Team in Fairfax, VA, USA
- Knowledge transfer about the RTI to the performance tester
- Acquiring the hardware, installing RTI and setting up test environment
- Effective result analysis and identification of bottlenecks

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