Introduction

This document examines the choices and decision-making process involved in migrating from a LoadRunner strategy to a Performance Center strategy. This analysis includes a discussion of the LoadRunner and Performance Center products, an explanation of the benefits of Performance Center, and presents the common strategies that can be used to migrate from one setup to the other. Although LoadRunner is an industry-leading performance testing tool and its usage and setup are widely known, the additional benefits of a Performance Center installation can leverage many of the known benefits of LoadRunner across multiple areas of a customer’s business. Factors such as usage, expected growth, current setup, and direction of the company are not addressed in this document but must be considered when making this investment.

Overview of LoadRunner

LoadRunner is an application set that provides businesses a way to reliably simulate the load of multiple users against their given application. LoadRunner emulates hundreds of thousands of concurrent users to apply production workloads to almost any client platform or environment. LoadRunner stresses an application from end to end applying consistent, measurable, and repeatable loads. It then uses the data to identify scalability issues that can affect real users in production.

As it drives load against the system, LoadRunner captures end-user response times for key business processes and transactions to determine whether an organization can meet its service-level agreements (SLAs). Non-intrusive, real-time performance monitors obtain and display performance data from every tier including server and system components. Diagnostics probes gather code-level data to isolate bottlenecks at the SQL statement or method level. After the load test completes, the LoadRunner analysis engine provides a single view of end-user, system-level, and code-level performance data, reducing time to problem resolution. It includes an Auto Correlation engine to scan user, system and diagnostics data, and provides the top ten likely causes of system slowdown. This helps users to determine whether they have met their goals, and if not, why not and who owns the problem.

Key features and benefits of using LoadRunner include:
- Decreases the risk of deploying systems that do not meet performance requirements
- Reduces hardware and software costs by accurately predicting system capacity
- Enables intelligent service-level management before services go live
- Shortens test cycles to accelerate delivery of high quality applications
- Pinpoints end-user, system-level, and code-level bottlenecks quickly and easily
- Reduces the cost of defects by testing early in the development cycle

The LoadRunner setup allows for repeatable and reliable testing, which is integral for troubleshooting and baselining of applications under test (AUTs). Analysis of the LoadRunner test results show how to tune the AUT or where bottlenecks in hardware or application performance reside. This allows development teams to concentrate their troubleshooting efforts on these areas.

LoadRunner is mainly used when one or multiple applications are load tested within one line of business and restricted to one location. Therefore, different testing teams must be physically present at this location and must often schedule their time on the server to ensure that conflicts do not occur. In short, this is not a scalable model when customers have applications that need to be load tested from different locations. It also does not allow access to LoadRunner experts in other locations, as remote access to the LoadRunner machine is against HP license usage policy.

Overview of Performance Center

Performance Center is an enterprise-class performance testing software, designed for both global standardization and the formation of a performance testing Center of Excellence (CoE). Performance Center is a set of servers that provide a remote and common interface into the testing effort. The creation of scenarios and managing of resources, Controllers and Injectors, is done via this interface. All of the scripts, scenarios, monitors, and results are then stored within Performance Center, so that it can be leveraged from one stage of the project to the next with minimal re-creation.
Additionally, the concept of a project is introduced in Performance Center. A project is a logical grouping of scripts, monitors, and scenarios around a particular application area. This leverages the scripts that already exist in the project to be used in multiple tests for that application area. It also allows for repeatability between phases and versions of the application under test.

Benefits of Performance Center

Performance Center is not a Web interface for LoadRunner. This is often a common misconception that leads to confusion and problems in both the deployment and usage of Performance Center as a whole. There are a number of benefits that Performance Center has over LoadRunner that need to be looked at for a customer’s business. Figure 1 opposite illustrates Performance Center and a high-level overview of the functionality.

The benefits of Performance Center reside in the testing management aspect of a customer’s testing environment. Performance Center allows the client to manage the utilization, licensing, usage, and setup of the performance testing environment. Performance Center also brings environment stability and provides the highest-usage model for the hardware resources. Performance Center employs a project setup and configuration that allows different projects to have Vusers available to them and a number of Host machines. This prevents projects from using all of the resources that are in the environment, especially small projects with a small number of Vusers that will use up the license on that Controller. With Performance Center, resources are managed in a pool of Vusers and a pool of Controllers that can be mixed and matched to meet the specific needs of a project. As smaller projects enter the environment, they use only the licenses that are required for the test. The remainder are left to be pulled for other projects and for more effective license utilization overall.

Figure 1: Solution for Enterprise-Scale Performance Testing - HP Performance Center

Additionally, Performance Center allows for the customer to maximize hardware utilization. In the past, a small project or test would use the whole Controller and Vuser license for the test even if it didn’t require the hardware resources for that test. By setting up projects within Performance Center to limit the number of Vusers as well as the number of Hosts, Performance Center can provide more testing using the existing Hosts more efficiently and cost-effectively.

The management of the physical environment is also handled within the interface of Performance Center. This allows for monitoring of the customer’s testing resources for availability as well as patching and upgrade capabilities. As LoadRunner environments grow, the effort involved in keeping all of the machines at a current patch level and operational level also grows. Performance Center allows for this process to be monitored and controlled via the administrator site. The ability to monitor the whole of the Performance Center environment is built into Performance Center. This allows for automated reporting of hardware outages as well as leveraging the flexible nature of Performance Center to use all of the resources available for testing efforts. Because of the pooling of resources, outages do not impact testing efforts as much as the loss of a Controller did in the LoadRunner environment.
Migration from LoadRunner to Performance Center

When looking to migrate from an existing LoadRunner environment to Performance Center, a number of things need to be considered: how this migration is to be implemented, the existing assets that can be leveraged to make this both cost-effective and efficient, the resources needed to maintain this compared to maintaining LoadRunner, and where this effort will lead in the maturation toward a performance testing CoE. These questions are addressed in the sections below.

Strategies

1. Side-by-side migration – Build a new Performance Center environment as a whole, while keeping the LoadRunner environment intact.

2. Gradual migration – Build the core of the Performance Center environment and gradually reuse existing LoadRunner machines to augment and build out the new Performance Center environment.

3. Automated structured migration – Recreate the existing LoadRunner scenarios and scripts into Performance Center. This can be done by duplicating them in Performance Center by incorporating Performance Center User site features and/or directly updating the Performance Center schema using an automated script.

Side By Side Migration

Strategy 1: In this set up, both instances run for a time while assets (scripts) are moved to the newly created Performance Center projects and the scenarios and monitors for those projects are created. This allows customers to train on and to provide testing for all existing efforts while new testing efforts can utilize Performance Center from the start. There is a higher cost as the customer will need to duplicate both environments and have close to double the number of physical servers for a time. This does, however, provide a safer way to upgrade and enhance the hardware to be used for testing (larger servers, increase RAM, etc.) There is a lower risk associated with this approach as the existing LoadRunner installation is operational and available for fallback if the customer has issues with migration or configuration of the new environment.

Gradual Migration

Strategy 2: LoadRunner is up and running and Performance Center’s core servers are set up. As projects are set up and scripts are migrated, LoadRunner machines are slowly decommissioned and added to the existing Performance Center environment as Host machines.

In other words, a full installation of the Performance Center servers (Admin, Web, Utility, File System and Database) run with one to two Host machines (decommissioned and reinstalled LoadRunner Controllers and/or Injectors) to prove stability. After these have been validated and setup, scripts are migrated into a project (usually a highly active and existing project) over to the Performance Center environment. Projects within the customer business should be prioritized on usage and risk, where higher usage and lower risk projects are the first to be moved, then higher usage and higher risk, and so on. Scenarios and monitoring groups are then set up for this project and after they have been done, the testing efforts for the project are moved to Performance Center. This allows for the load of tests on the LoadRunner environment to decrease gradually and allows the performance testers extra time to migrate scripts from all the other projects over to Performance Center. This does not affect the ongoing testing. After all of the assets of a project have been moved (scripts migrated) or created (scenarios and monitors setup), that project can then stop using LoadRunner and start using Performance Center. As the number of LoadRunner tests decreases, the LoadRunner hardware is gradually moved from the LoadRunner environment and augmented in the Performance Center environment.
Despite the ability of gradual migration to leverage existing hardware, it does increase the risk factor, as neither environment has full capability while the migration is taking place. In some cases, those risks have to be measured against the cost of duplication.

Automated Structured Migration

Strategy 3: In this approach, existing LoadRunner scenarios and the scripts within the various projects are evaluated first. The second step is to recreate the same structure within Performance Center so that all LoadRunner assets are converted and migrated into Performance Center. This approach requires a deep and thorough understanding of both LoadRunner and Performance Center features to replicate the LoadRunner assets into Performance Center without any loss of assets during the migration. At the end of the process, Performance Center would be able to host the same LoadRunner scenarios and associated scripts, as well as the run-time settings for the scenarios and monitors that are associated with each LoadRunner scenario.

As this method involves moving all of the assets at once from LoadRunner to Performance Center, testing efforts can begin almost immediately in the new Performance Center environment using the migrated LoadRunner assets. The testing can continue on the existing LoadRunner environment as long as no new projects are being introduced. This process is also the fastest among the three approaches as most of the LoadRunner assets are moved in a short period of time. For example, creating projects in Performance Center and associating LoadRunner scenarios within those projects can happen at the same time as importing the scripts for that project.

The advantages are faster migration and the reuse of existing LoadRunner infrastructure and test assets. The only risk is the minimal downtime required when testing cannot be performed or is limited during the actual migration of LoadRunner assets to Performance Center.

Asset Migration Considerations

There are a number of assets that can be reused in the above strategies. The largest assets are the scripts used in LoadRunner. Scripts can be ported over to Performance Center by using the migration and saving utility with Vugen. Scenarios and monitors have to be recreated within Performance Center, but these are very small investments of time compared to those required to develop scripts for applications.

Hardware can usually be reused. In any of the above strategies, the LoadRunner hardware can be recycled after usage. Keeping both environments up and running at the same time is usually costly because it adds additional servers to the environment that are then phased out as they are not needed in the new environment. To keep existing testing efforts running consistently, it is recommended to allow for a small Performance Center setup to take place and then decommission and reinstall LoadRunner machines as testing projects have been migrated to Performance Center. The Performance Center environment, however, cannot use existing LoadRunner machines while those machines are still being used in LoadRunner.
Resource Considerations

The move from the LoadRunner to Performance Center platform creates a need for a new role(s) or a modification of a role(s) within the quality testing department. The role(s) is either the transition from a LoadRunner admin to a Performance Center admin for the installation, or the creation of that role if one does not exist. Additionally, the larger number of servers in the overall environment may require an owner of this hardware, and this role may be assigned to the admin as well.

Performance Center Admin: This is the user or users (backups are always needed in higher-usage applications) who manage the setup of projects, users, and user groups, as well as the introduction of Hosts into the Performance Center environment. The Performance Center Admin should be part of the installation and migration functions from LoadRunner to Performance Center to gain a firm working knowledge of how Performance Center works. This can be a full-time role as the size of a customer’s environment grows, or it can be a sub-set of an existing role. It is important that this role is defined to keep stability and to ensure that there is a resource(s) with knowledge of the environment as a whole. This role should include troubleshooting of Performance Center, error handling, and reporting from the Performance Center system (not from the tests run within Performance Center). If this role includes ownership of the hardware, then familiarity with IIS, Windows Server setup, and configuration is needed, as well as large-scale application troubleshooting abilities.

Conclusion

There are a number of benefits to migrating performance testing to the Performance Center environment. The additional investment in Performance Center product and hardware generates added stability and usability of testing coupled with the capabilities of LoadRunner. The methodology of testing does not change; rather Performance Center gives testing teams and QA departments a better way to leverage knowledge and technology across different projects and geographic regions. This allows for higher usage of the investment in both Performance Center software and licenses, as well as the hardware in the customer’s Performance Center environment. The additional benefits of stability and higher usage of hardware and existing license allow the business to gain a greater return on their performance testing investment. The logical next step for customers who are contemplating the move to Performance Center is to perform a migration assessment. This assessment will help in documenting the available options that are best suited for the environment to assist in the decision making process.

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