SAP White Paper
SAP LoadRunner by Mercury

LOAD TESTING: MITIGATING RISK BEFORE GO-LIVE

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EXECUTIVE SUMMARY

Today, across all industries, organizations are challenged to discover new markets, create innovative new products and business processes, and compete on complex playing fields. Robust, reliable enterprise software is one of the most important assets an organization has for fulfilling these mandates. But investments in enterprise software are costly and require extensive justification and proof that the technology reacts quickly and effectively to changing business scenarios, rapid increases in data volume, and multiple application types.

Compounding the complexity of the IT issue is the heterogeneity of solutions. It is common practice to stitch together packaged enterprise application suites, best-of-breed applications, legacy systems, and even external services all under one roof. Even the simplest business processes often span different organizational units and various systems, requiring some facilitation of communication across applications and platforms.

While IT must be in cost-effective alignment with business initiatives, extensive cross-wiring of systems can threaten an organization's bottom line. Increased risk of suboptimal performance, system bottlenecks, or complete failure comes with this territory, also increasing the potential for system breaches at moments that are most critical to a business's success.

So if the primary role of enterprise software is to facilitate and optimize business processes, mustn't it, too, be optimized to ensure the most reliable system performance possible? Rigorous testing of new, upgraded, and newly integrated software applications, before they go live, is one proven way to mitigate the risk of underperformance and to decrease the cost of ownership on IT.

THE IT INVESTMENT AND ASSOCIATED CHALLENGES

The world of IT has reached a new phase of maturity. Rather than rampant, unthinking growth in investment and innovation, IT must now justify costs – with a solid demonstration that risk will be mitigated. Analysts have had a field day citing the potential for risk. A leading analyst firm has reported that 50% of deployed applications are rolled back. And others have pointed to risks that arise from "unknown factors."

Success or failure is often determined by the timeliness of go-lives, which can be threatened for any number of reasons, although technology is frequently cited as the core issue. And even after years of IT implementations:

- Only 16.2% of projects are delivered on time and within budget.[1]
- 52.7% of projects cost over 189% of the original estimate.[2]

When the implemented solution doesn't meet the business need, then problems that are even more significant arise. Projects completed by the largest U.S. companies have only 42% of originally proposed features and functions.[3]

1. The Standish Group CHAOS report (1995).
2. The Standish Group CHAOS report (1995).
3. The Standish Group CHAOS report (1995).

A look at industry drivers has also allowed analysts to illustrate the difficulties surrounding system implementation in a larger context.

As Gartner observed, "Three fundamental drivers have recently emerged that contribute to the new forms of complexity in software platform markets:

1. Product categories are no longer well defined and no longer match traditional markets.
2. Software suites, intended to simplify software choices, create a chaos of overlapping and uncertain offerings.
3. The modularity of suites deepens, rather than eliminates, proprietary lock-in because of the lack of shared standards."[4]

THE BUSINESS INITIATIVE

A rapidly changing business landscape and the imperative to keep pace with competitors have created increasing cycles of reinvention in mission-critical core business processes. The need to continuously improve business processes and the quest for cost-driven efficiencies put companies on a collision course straight toward the risks inherent in technological improvements. Running core business processes at less than optimal levels creates still other competitive challenges. The end results: break points often appear between disparate technologies within an IT landscape just as an organization's IT skills lag, the rate of technology change increases, and budgets shrink.

CIOs are truly caught between two very difficult positions. They know that the skills gap between technology innovations and their companies' IT users has increased. At the same time, they realize that successful implementation of technology can drive significant growth to the bottom line in a number of ways. These opportunities cannot be ignored, but when growth goals involve technology implementation, the importance of achieving the following is paramount to a project's success:

- **Timeliness:** Create on-time and on-budget project go-lives. In today's operational reality of tight budgets and scrutiny, it's essential to adhere to budgetary directives. Companies often cite "handling technological difficulties" as the reason for overruns. Unfortunately, many project consultants have a business rather than a technical background and often cannot identify the arcane and sometimes highly technical risks the project faces.
- **Insight:** Ensure that there are no unforeseen difficulties during implementation or throughout the project life cycle. IT projects are notorious for their surprise quotient. Indeed, as one CIO recently commented, "We just don't know what we don't know." Surprises are an unwelcome reality, particularly since they often come on the heels of other problems. Taken together, the surprises and the original problems will require additional budget, in turn creating budget overrun.

4. Gartner, "Software Suites Offerings Proliferate, and Complexity Engulfs All," Yefim V. Natis, February 2005.

- **Performance optimization:** Even the best-prepared CIO credited with an on-time, on-budget go-live can face criticism because of lackluster system performance and the attendant challenges in creating user satisfaction.

Extensive system testing in advance of go-live helps avoid potentially costly surprises that delay projects or drive downtime. In the testing phase, strict engineering should discipline the IT landscapes to measure throughput capacity and performance levels.

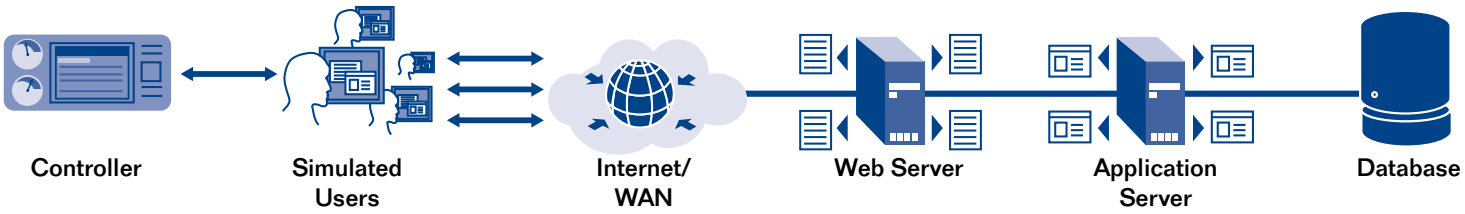
THE SOLUTION

When to Test

Thorough load testing can benefit your system at many junctures in an IT implementation:

- Before new installations/deployments
- During capacity planning and sizing
- During the integration of new components/business scenarios
- During functionality and performance tests of a chosen solution
- Around in-house developments
- During upgrades or updates

Automated to test the full spectrum of business scenarios, SAP® LoadRunner by Mercury predicts system behavior and performance under any of these conditions. The SAP LoadRunner application emulates hundreds or thousands of concurrent users to put applications through the rigors of real-life user loads, allowing IT groups to stress an application from end to end and measure the response times of key business processes. Simultaneously, SAP LoadRunner collects system and component-level performance information through a comprehensive array of system monitors and diagnostics modules, validating application performance during each stage of the project life cycle.



- Replaces real users with thousands of “virtual” users
- Generates accurate, measurable, and repeatable load on the system from a single point of control
- Pinpoints bottlenecks in the system

Figure 1: Emulating Production Workloads with Automated Load Testing on an IT System

Benefits of Performance Testing and Management

Testing processes before they go live helps project teams make necessary corrections, and then retest, before the processes are delivered to their end users. Rich Guidotti, process lead for availability management at Dow Chemical, stresses the benefit of knowing in advance whether or not applications are ready to meet the service levels their end users expect: "[With SAP LoadRunner] we're able to generate reports that use Six Sigma terminology and support our service-level management objectives. This way, both IT and our business units are able to get answers to the same, quality-centric questions. 'Am I in Six Sigma compliance? What defects or variations exist in my IT systems? What steps are we taking to reduce those defects or variations?' "[5]

Using this methodology, SAP LoadRunner customers have achieved substantial results such as the following:

- Reducing support costs by 50%–60%
- Increasing online user capacity by up to 100 times
- Improving application response time by 75%–500%
- Cutting the time to resolve problems by 50%
- Reducing application failure rate by 50%–80%

How It Works

In a typical situation, an IT project team might want to launch a new business process. The team will use SAP LoadRunner to validate and test the performance of the software that supports the process. This is usually a five-step process:

1. Define the business process

The team uses SAP LoadRunner to determine the optimum hardware and software platform, based on the operations of the business process itself.

2. Develop the script

The team then develops one or more test scripts to "walk" the software through the actual screens and entries that will be used by the business process. This script represents the activities of a virtual user.

3. Expand the user load

The team uses SAP LoadRunner to increase the virtual user load in order to simulate the peak loading requirements for this business process.

4. Evaluate results

SAP LoadRunner measures simulated performance against the key performance indicators for the process and then recommends any necessary changes to the related enterprise software systems.

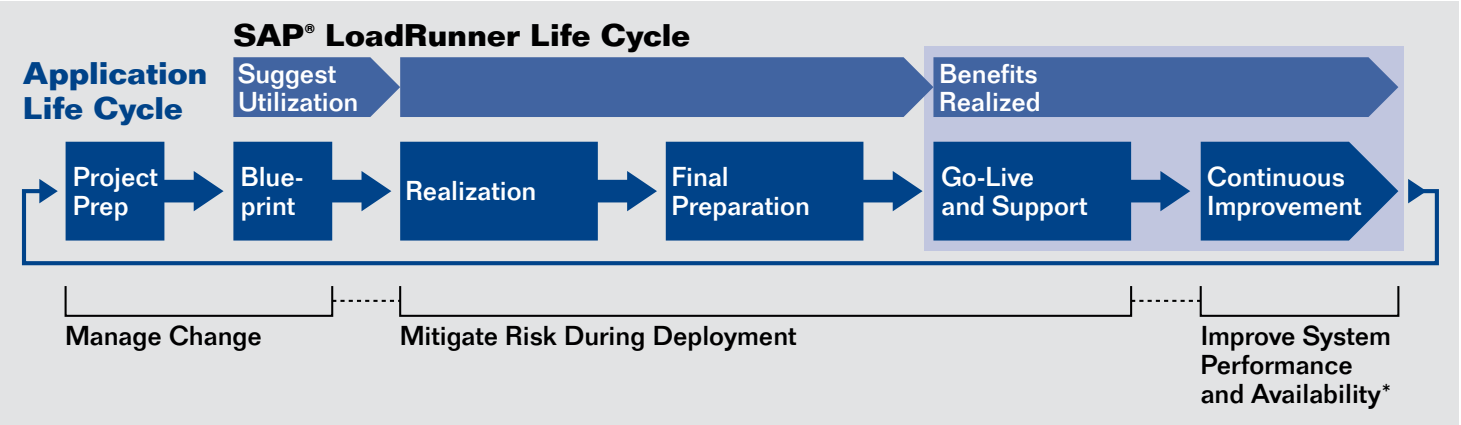
5. Retest to validate

The team uses SAP LoadRunner to rerun the tests, using the modified environment, to validate the effectiveness of the changes.

5. Mercury Interactive, "Optimizing IT – Dow Chemical and Mercury" (June 2004).

Support for Production Environments

SAP LoadRunner scales easily from small user environments to very large environments that support tens of thousands of users with complex application needs. At the same time, the application measures the full, end-to-end performance of business processes even when those processes cross between enterprises, as they typically do in supply chain and demand chain business processes. Also, because SAP LoadRunner is integrated with the computing center management system from SAP, it lets organizations automate application load testing and operates with minimal administrative overhead. SAP LoadRunner is powered by the SAP NetWeaver® platform, the open integration and application platform that unifies technology components into a single platform, allowing organizations to reduce IT complexity and obtain more business value from their IT investments.



*Constant upkeep and monitoring of system performance

Figure 2: Project Life Cycle

CONCLUSION

The importance of protecting and insuring enterprise IT investments mounts as the complexity and number of IT systems resident in organizations grows and the sophistication of new technology increases. As risks expand – including everything from downtime to implementation delays, loss of efficiencies and functionality, negative impact on growth from delayed innovations, and soured customer relationships – the value of preempting those problems grows. As Thomas Steinrich, manager of the Customer Competence Center at Linde Gas AG, put it, "If our resellers cannot sell our product, we will lose customers and damage our business. And if something harms the sales channel, by not having the right performance or, even worse, not having the portal available, then we would have big, big problems."

With significant market share in load testing worldwide, SAP LoadRunner by Mercury's market-leading functionality mitigates performance risk and accelerates application delivery, optimizing business agility. SAP LoadRunner represents an important solution for companies that move to an enterprise service-oriented architecture (enterprise SOA), a framework for service-oriented computing. Enterprise services are far more dynamic, and therefore less predictable, than traditional applications. Because of its compatibility with platforms that support enterprise SOA, SAP LoadRunner is essential in helping enterprises plan, deliver, and benefit from the newest classes of service-driven business processes.

Contact

For more information about SAP LoadRunner, please contact your local SAP customer engagement manager at 1-888-727-2955 or go to **www.sap.com/usa/saploadrunner**.

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