Application performance and availability lifecycle management: Reduce time, effort and cost in pre-production and production

White paper

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Should you invest more to identify problems before an application is launched, or in additional tools and IT processes to identify, isolate and resolve problems faster to reduce the impact in production?

Executive summary

Today, underperforming business services can critically affect your ability to support your customers and ultimately your profitability. You need to consider where in the service lifecycle you should invest. Should you invest more to identify problems before an application is launched, or in additional tools and IT processes to identify, isolate and resolve problems faster to reduce the impact in production? These challenges are augmented by new application architectures such as service-oriented architecture (SOA) and composite applications. Performance problems continue to occur, despite strides many organizations have made with performance testing and tuning technologies.

Poor performance management throughout an application's lifecycle can result in:

- Sluggish application performance
- Inability to prevent down time
- Long mean time to repair (MTTR)
- Excessive deployment cycles
- Budget overruns

There are many reasons why applications don't perform as expected even with the myriad of tools available to address performance issues. Most IT organizations implement various tools separately, or worse, as point products or piecemeal, which only exacerbates the challenge of delivering applications that perform more efficiently. In addition, using a variety of individual tools increases costs and decreases IT efficiency and collaboration among project teams.

Enterprises need an integrated process to manage performance across the entire application lifecycle—from pre-production development and testing through "go-live" deployment into production and back—and a process to leverage existing knowledge and investments in tools, training, infrastructure and best practices.

HP lets you take a lifecycle approach with performance and availability lifecycle management. The HP model focuses on increasing collaboration and data sharing among development, quality assurance (QA) and operations staff across the application lifecycle. It combines software, processes and methodologies and complements them with managed services offerings and professional services.

Using HP performance and availability lifecycle solutions, customers have achieved significant improvements in their ability to diagnose and resolve performance problems, prevent application downtime, utilize tools and skills more effectively across development, QA and operations teams, and optimize the performance of applications from an end-user perspective.

This white paper examines the shortcomings of traditional approaches to optimizing application performance and outlines the advantages of the performance and availability lifecycle. It also provides a brief overview of the role HP products and services play in the performance and availability lifecycle. The HP performance and availability lifecycle supports the service lifecycle by improving service performance from service transition to service operation. It mitigates risk, provides quality and ultimately delivers more responsive, stable services.

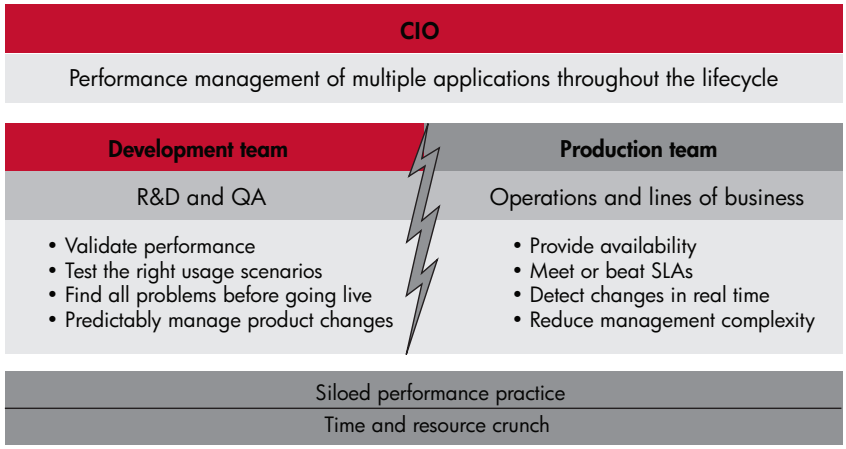


Figure 1. Costs are often wasted on both sides of the wall between development and operations. You can reduce IT costs and improve business outcomes by sharing resources.

What's wrong with the traditional approach to performance management?

There is no single traditional approach to performance management, and that is precisely the problem. Every company works differently, and every application process works differently—even within the same company. This section discusses a few of the typical results.

"Go-live" problem: the walls among development, product application support and IT operations
All too often, there is a big difference between how an application performs in pre-production testing and how it performs in the production environment. The root of the problem is that there is little or no collaboration among pre-deployment development and QA teams and the operations group that manages the production rollout.

Each group views its role as a series of discrete tasks that are independent of the other group's responsibilities. For example, development may focus on validating performance, testing usage scenarios and pinpointing performance issues, while operations may focus on meeting service-level agreements (SLAs), measuring availability levels and addressing configuration issues. Service-level requirements for successful operations are often not included during design and testing. For this reason, ITIL V3 highlights the need to include service-level requirements for successful operations in the design and testing phases.

But how do developers know what usage scenarios to test if they don't have visibility into real, end-user behavior? Tools can now track and capture actual user application behavior, such as click-stream traffic, page performance, application error and visitor sessions on web-based applications—but if the information gained from these tools is not shared across the application lifecycle, the value is limited at best.

Likewise, if your production team lacks the application knowledge to repeat the conditions that cause performance problems and isolate performance problems in a controlled manner, the lack of collaboration costs you time, money and talent.

Costs are wasted on both sides of the wall—money that you can save by sharing resources.

"Tool silos:" technological challenges

Beyond the organizational issues that limit collaboration on performance and availability management, you can have technological issues. Each team typically uses its own tools, processes and infrastructure, which is not only inefficient but can also directly affect performance and availability management. For example, testing environments often differ from production environments, because production environments use a mission-critical infrastructure that is expensive to replicate. Load tests are often scaled back due to a lack of machines to execute tests. As a result, software may perform well in performance tests, but it doesn't perform well once it is deployed into production. Likewise, each group develops its own skill sets, many of which are specialties that are not accessible to other teams or other lines of business. The result: missed opportunities for information sharing, redundant infrastructure purchases and inefficient use of people, tools and technologies.

You need a common understanding of basic metrics: what the actual usage behaviors are, what the functional requirements are, what the key performance indicators (KPIs) are and how to measure them—and most importantly, how to harness the combined knowledge of your organization to manage application performance and availability across the entire lifecycle. When you can leverage your resources across the lifecycle, you can cut costs dramatically while improving application performance, availability and service levels.

The HP solution: application performance and availability lifecycle management

Clearly, the ad hoc approach to the performance and availability lifecycle doesn't work, and the increasingly siloed nature of performance practices only exacerbates application performance and availability problems.

Overview

The HP approach to application performance and availability lifecycle management focuses on integration, collaboration and resource sharing—from pre-deployment application development to production application management and back again. Technology supports collaboration. For example, the ability to reuse scripts has been available, but collaboration among teams did not occur, because each team did not know what existed in the other teams. The HP approach bridges the gap among development, QA and IT operations so that your teams can work together more effectively, understand and meet end-user performance requirements, and cut cost, complexity and deployment timeframes.

For example, your QA team can interview business management to understand what to test and what the KPIs should be, based upon a number of users performing a specific number of business processes. Likewise, your operations team can interview business management to determine which key business processes to monitor—leading to efficiency for both IT and the business.

In most cases, the business process you test for scalability and functionality is the same business process that must be monitored. HP lets you take testing scripts and directly use them to monitor business process from the end-user perspective. Additionally, we let you take real-user session information and generate HP LoadRunner software and HP Business Process Monitor software scripts. HP Business Availability Center software also supports this process improvement with its common script repository.

Customers who already use HP Performance Center software, such as HP LoadRunner and HP diagnostics software, to optimize application performance in the pre-production environment can also use these products and resources through HP Business Availability Center for production monitoring. Using common software and scripts in the context of a well-defined process and best practices, your development and operations teams can more quickly identify performance problems, diagnose the root cause, resolve the problems in less time and prevent many performance problems from occurring.

HP Managed Software Solutions connects the pre-production and go-live phases and is the fastest way to get started with application performance and availability lifecycle management. By leveraging our pre-deployed infrastructure, you can begin testing almost immediately. A named technical account manager delivers best practices and knowledge transfer regarding load modeling, test execution and analysis so that your applications perform as expected in your production environment. Once the application goes live, the technical account manager leverages the baselines and scripts stored in the common script repository to accelerate production monitoring from the first day of deployment. Lastly, testing and synthetic monitoring scripts can be created based on real-user session information to improve IT alignment with business needs. You can also transition from HP Managed Software Solutions to an in-house deployment once you have the necessary infrastructure and skilled resources in place.

Key benefits

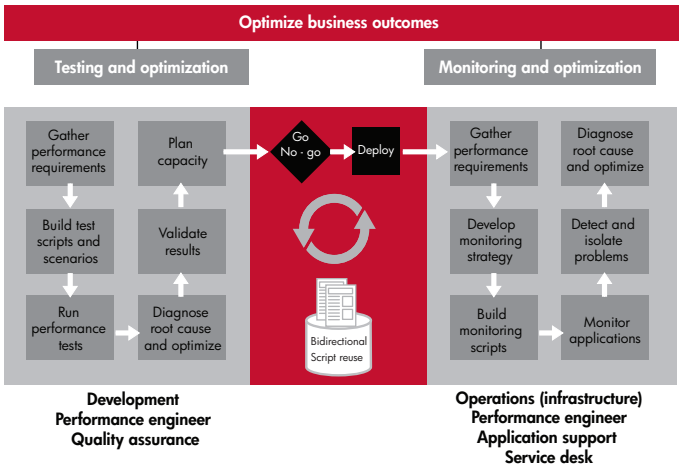
- Reduce production outages due to performance and availability issues.
- Increase IT efficiency by breaking down departmental silos and fostering collaboration.
- Increase the ability to run more test cycles by decreasing the amount of time for creating test scripts.
- Reduce costs by decreasing the number of defects that reach production, outages and calls to your help desk.
- Deploy applications into production faster at a lower cost and with less risk.
- Lower the MTTR for problems that occur during the application lifecycle.
- Manage your application's performance and availability with a comprehensive set of best practices and optimization services.
- Use HP Managed Software Solutions for faster time-to-value and lower cost of ownership throughout the application performance lifecycle.

Checklist: You need application performance and availability lifecycle management to…

- Improve application performance and availability by integrating your processes for load testing, diagnostics and end-user monitoring.
- Mitigate risk and lower your cost of ownership for applications.
- Track and capture actual end-user application usage and behavior.
- Reduce risk due to new application rollouts and applications and infrastructure upgrades.
- Streamline the testing cycle so you can run more tests and resolve problems before they are introduced into production.
- Increase efficiency for your development, QA and operations teams.
- Decrease redundant efforts by QA and operations to collect KPIs for critical business processes.
- Outsource your application testing and production monitoring due to resource constraints or a lack of in-house skills.
- Test and measure performance from outside the firewall.
- Define performance objectives for new releases and upgrades.

Figure 2. Companies that successfully implement a lifecycle approach begin by defining business objectives and service-level objectives, and follow a closed-loop process from service transition to service operation with a focus on continuous improvement.

Performance and availability lifecycle process



Implementing application performance and availability lifecycle management

Many companies do not question whether or not to implement a lifecycle approach to application performance and availability management. They understand the value and the urgency. The question is how. This section discusses key organizational and process considerations, provides a brief overview of products and services from HP to assist you, and answers the questions we hear most often from our customers.

Application performance and availability lifecycle management process

The first step in adopting a lifecycle approach to application performance and availability management is to establish a consistent, repeatable methodology—so that the right people use the right products with the right skill sets at the right time, and so that all key assets, such as scripts, monitoring data and configuration data, are reusable. You need a bidirectional flow of information to and from QA and production so that you can reduce the duplication of work and promote the sharing of information and expertise.

Key phases and goals in this process include the following steps:

- Define business objectives and KPIs to measure progress toward those objectives early in QA—prior to testing or monitoring. The KPIs serve as a foundation for production monitoring and management and are driven by the business users.
- Similarly, define service levels from the user perspective early in operations. Per ITIL V3, operations should provide input into service levels and the architecture needed to support operations as part of service design. You derive these from the KPIs, and they represent a commitment from operations to the business users. These service levels drive future decisions about how to optimize the management of your business services and provide communication to the business users. Service levels should be based upon the end-user experience as measured by real users or synthetic measurements and should have corresponding operational-level agreements (OLAs) that reflect infrastructure availability. Create a mechanism for communicating status based on KPIs and service levels.
- Create a cross-functional team to support all performance and diagnostics needs for both production and testing environments. You may want to place this team under the direction of a new "development and operations liaison" position, someone responsible for coordinating the activities and toolsets of pre-production and production teams. If you do not have trained resources on staff, you should make provisions for managed services and for the ongoing mentoring or education services for classroom training as necessary.
- Evaluate specific tactics for optimizing performance and availability. You can use monitoring and diagnostics software to identify and repair problems in development, which is usually less costly than repairing them in production. You should practice an iterative approach to testing and tuning until you meet your key performance objectives.

- Once you have identified and addressed specific performance and availability issues, you can make a "go/no-go" decision about releasing an application into production.
- Once you make a "go" decision and deploy the application into production, you need to manage the performance and availability of the business service. You should use integrated products to understand and manage the end-user experience and SLAs, logically map the applications to the infrastructure they run on, monitor performance and availability and diagnose problems. Set thresholds to proactively identify problems before they impact your users.
- You then need to manage change and capacity issues, such as upgrades, patches and customizations through proactive testing, tuning and monitoring.

HP products for the performance and availability lifecycle

HP offers integrated HP Performance Center and HP Business Availability Center software to assist customers in optimizing the application performance and availability lifecycle. You can deploy these products using HP Managed Software Solutions, so that you can access an "instant center of excellence" for optimizing application quality, performance and availability. HP Managed Software Solutions experts work with you to remotely test and monitor complex, business-critical enterprise resource planning (ERP), customer relationship management (CRM) and custom applications.

HP Performance Center is an integrated set of software products designed to automate key performance optimization processes, such as testing and tuning, bottleneck identification, capacity planning, and diagnostics. It includes:

- An application delivery dashboard, which integrates best practices across all performance-related activities and generates, collects and displays KPIs from multiple sources
- HP LoadRunner, which generates consistent, measurable and repeatable load tests from a single point of control, allowing you to replace real users with thousands of virtual users
- HP diagnostics software for identifying and resolving performance bottlenecks
- HP SiteScope software for performance monitoring

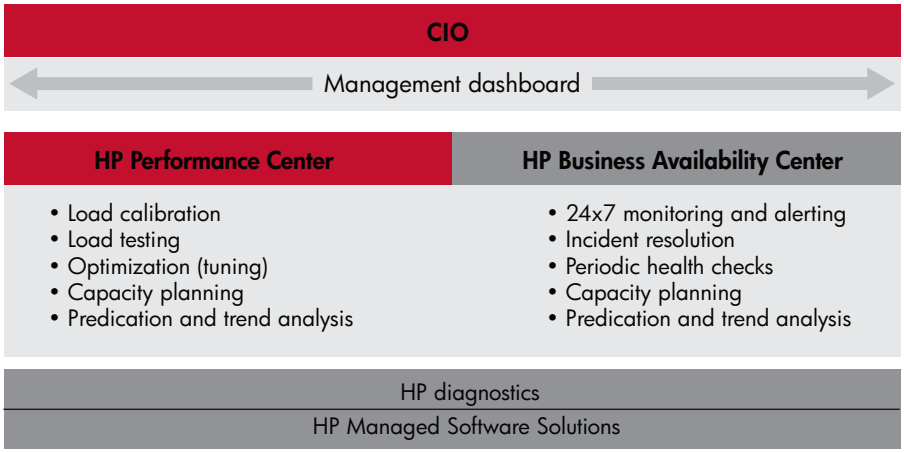
HP Business Availability Center provides a unified dashboard for managing IT operations to meet business objectives. It lets you view key business process and system indicators in real time, from an end-user, business-level and service-level perspective, and lets you use a "center of excellence" so that your production applications meet service-level goals and deliver business results. It provides 24x7 application and infrastructure monitoring and alerting, diagnostics, periodic health checks, capacity planning, prediction and trend analysis. A critical element of HP Business Availability Center is HP end-user management software, which proactively monitors application performance and availability from the end-user perspective, so that you can fix issues before customers experience problems. With HP Business Availability Center, your operations team can filter real-time user information to your development and QA teams so that you can reduce MTTR, improve service-level performance, decrease application downtime and lower the total cost of monitoring enterprise applications and systems. You can also select service subscriptions from a service catalog.

HP Managed Software Solutions

Using our pre-deployed environment for HP Performance Center and HP Business Availability Center, a named technical account manager works with you to model the load and determine usage scenarios and KPIs. This person assists you in your test runs and data interpretation to determine whether your application can scale to meet your business needs. Once your application is ready to "go live", the technical account manager leverages the baselines and scripts developed during the testing phase for application management. The technical account manager configures the reports, service levels and dashboard according to your specific requirements, mentors your team on how to use the products and explains how to diagnose and resolve problems.

By using our experts and pre-deployed infrastructure, you can realize the value of your investment in a matter of days or weeks. HP Managed Software Solutions is the most effective way to get started with application performance and availability lifecycle management. You can transition to an in-house solution when infrastructure and trained resources become available or continue with managed services and focus on your core competencies.

Figure 3. With HP Managed Software Solutions, you can realize the value of your investment in a matter of days or weeks.



The HP advantage: integrated tools and managed services

Nearly all prospective customers ask us whether they need to implement all of the products and best practices to support application performance and availability lifecycle management. Our products are integrated. You can use all of our solutions to extract greater benefit from your application performance and availability lifecycle model.

Existing point products typically work in isolation and are separated from other key systems, tools and processes. They contribute to the silo problems so many companies now face, rather than provide a bridge between silos. They do not integrate easily with other products, so you cannot measure, monitor or share KPIs throughout the application lifecycle. These products are event-driven, reactive and often inefficient. They often fail to scale and may require extensive manual intervention, which is error-prone, or expert assistance in data analysis and distillation.

On the other hand, HP software products are fully integrated and work well together at all phases of the application lifecycle. In fact, HP combines the system and end-user perspectives throughout the application lifecycle.

HP products consistently capture a wide range of application performance data that can be leveraged across the application lifecycle. Metrics relating to workloads, latency, availability levels and resource utilization are constantly monitored for each of the four key layers of the system: end user, infrastructure, application and database. The same data is then also used for different types of analysis, such as:

- Bi-directional script reuse: You can use QA scripts to monitor production and real-user sessions to capture and generate more realistic test scripts.
- Load modeling analysis: You can create an accurate load test that reflects real-life conditions, using real-user session data.
- Impact analysis: You can measure the impact of changes on the system in production ("before and after" snapshots) or during load testing. You can compare production results with synthetic load results or reproduce production results in the QA lab.
- Cross-environment analysis: You can differentiate between code and configuration issues so problems can move to and from production and synthetic load environments.
- Root-cause analysis: You can identify the underlying cause of performance degradation related to one or more tiers in the system, both in production using real load data or in pre-production using synthetic load data. This is the foundation for optimizing or tuning a system.
- Trend analysis: You can identify trends in performance deterioration in production before problems affect end-user performance and then reproduce it in a synthetic environment.

HP distinguishes itself by its focus on the end-user perspective, fully integrated lifecycle support and delivery through HP Managed Software Solutions.

HP also focuses on the end users' perspective throughout the application lifecycle. From the design and development of the application through testing, deployment into production and ongoing management, HP uses a top-down, business-process and end-user approach to quality and performance management. As a result, you can proactively identify end-user application performance issues before end users actually experience them.

HP Managed Software Solutions offers additional value. By taking advantage of its hosted environment and proven expertise, customers get an immediate and high return on investment because there are no set-up costs, no capital expenditures, no incremental training costs and effective knowledge transfer from HP to your staff. HP Managed Software Solutions also provides high flexibility because you can transition to an in-house deployment at any time.

Finally, tools and technologies are not enough to implement true, performance and availability lifecycle management. HP provides the products and technologies, integrated processes and best practices, implementation methodology, proven infrastructure and deep expertise to fully harness the potential of the lifecycle model.

Customer example: JPMorgan Chase saves $3.5 million

JPMorgan Chase is the second largest bank holding company in the United States, serving 90 million households through 2,667 banking centers in 17 states. The company turned to Mercury, now part of HP, to help cut costs and improve efficiency in application performance and availability lifecycle management.

The symptoms of the problem were typically of many large institutions: the lack of an end-to-end application and availability lifecycle management solution resulted in "team silos" and duplication of effort between development and operations teams, conflicting input for requirements, slow resolution of performance problems and higher-than-expected costs.

With services assistance, JPMorgan Chase implemented a lifecycle approach to application performance and availability management. The new approach featured centralized testing with cross-training on tools, creation of a single, end-to-end testing process, sharing of best practices and standardization of tools and techniques, resulting in smoother transfers, greater efficiency and reduced costs.

With the implementation of proactive production monitoring, JPMorgan Chase could also move to more predictive management through well-defined, alert-based SLAs, analytics reporting, trend analysis and integration of front-end and back-end data.

Professional Services guided JPMorgan Chase teams through the implementation process—from developing centralized services and identifying required services to harnessing best practices on centralizations and creating services.

The result: JPMorgan Chase attributes cost savings of approximately $3.5 million to the initiative through hardware and software cost avoidance and other cost efficiencies.

Common customer questions

Q: What circumstances or conditions indicate the need for application performance and availability lifecycle management?

A: Actually, it's a lack of critical information that demonstrates that your traditional application performance and availability management isn't working. If you can't quantify end-to-end application availability and performance levels, if you have challenges in identifying the root cause of performance and availability problems or if you have no clear visibility into the impact of application performance issues on your customers, you can benefit from application performance and availability lifecycle management.

Q: Who should own and drive the initiative to implement application performance and availability lifecycle management?

A: First you need to identify who owns the customers' or end-users' experience. Typically, this is also the organization that feels the most pain when applications become unavailable or perform poorly and will benefit the most from application performance and availability lifecycle management.

The initial push must come from a senior operations executive within IT or specific lines of business, supported by application teams. Executive buy-in is critical at this phase and depends on the initiative champion's ability to prove the value of the new approach over the limitations and challenges of traditional system management.

Note that HP Managed Software Solutions can be used for an initial quick win before you invest in hardware and training resources.

Q: What incremental technology purchases are required and when?

A: Many companies can leverage their existing HP LoadRunner licenses and skill sets. We recommend HP Business Availability Center to expose availability and performance issues, as well as HP diagnostics software for J2EE, .NET, and ERP and CRM environments to identify and resolve application performance bottlenecks faster.

Q: How does application performance and availability lifecycle management change current roles and responsibilities?

A: Often the transition requires a new role to bridge the gap between development and operations. It can also add responsibilities to development to meet specific performance requirements, and it adds responsibilities to operations to feed usage patterns and performance measurements to development. HP Managed Software Solutions can help fill resource gaps and let your teams focus on more value-added activities.

Q: What if we use another vendor's tools to monitor our production systems?

A: HP software integrates with software from other network and systems management vendors and can augment their system or infrastructure monitoring with our ability to provide end-to-end application monitoring. More importantly, the same scripts that you develop in testing can be used in production for application and end-user monitoring.

Q: We're concerned about the security and cost of a managed service.

A: HP Managed Software Solutions has completed a SysTrust audit and has a comprehensive security policy, which includes encryption, system hardening, physical security measures and intrusion-detection scans. Our systems are fully redundant and backed up regularly for data continuity. In addition, HP Managed Software Solutions uses HP Business Availability Center to monitor the health of the system and end users' quality of experience. The total cost of ownership (TCO) of HP Managed Software Solutions averages about 20 percent less than an in-house deployment.

Q: Does your model follow an ITIL framework?

A: Yes, HP software offerings have completed Pink Elephant's PinkVerify certification process, receiving the Service Support Enhanced certification. This verifies ITIL compatibility and represents the highest level of IT Service Management (ITSM) product certification.

Q: If an application has multiple tiers—web server, application server, database—which HP products can measure and monitor all of their performance metrics?

A: HP Performance Center and HP Business Availability Center measure the end-to-end performance of the business service to identify bottlenecks or performance problems that affect users. This lets you prioritize and effectively triage problems. Once you detect a problem, you can map the logical view to the physical view using HP Application Mapping software, part of HP Business Availability Center, and view the system metrics captured with HP SiteScope software, part of HP Business Availability Center.

Q: We have already purchased HP Performance Center and HP Business Availability Center. How do we handle the political issues with implementing application performance and availability lifecycle management?

A: We have a variety of service offerings that can help you identify and deal with the myriad of political considerations for your implementation, so that your project achieves improved effectiveness with minimal disruption.

Summary

Industry analysts and senior executives agree on two things: Service performance is directly linked to business success, and most companies can do a much better job of optimizing the underlying application performance and availability. ITIL V3 validates the importance of managing the service lifecycle to mitigate risk, provide quality and ultimately deliver more responsive, stable services. The HP approach to managing the application performance and availability lifecycle is a beneficial alternative to traditional ad hoc performance management processes, letting you lower the barriers among development, production application support and IT operations, which exacerbate rather than resolve performance and availability issues.

To learn more, visit www.hp.com/go/software

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