



**Hewlett Packard**  
Enterprise

# Five-star performance

Win customers with world-class application performance





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In today's digitally driven business climate, high-quality application performance is essential to the success of your business. You cannot afford to go live with poorly performing applications or software updates that anger and alienate your customers, partners, and employees. This reality drives the need for an aggressive approach to testing software that includes the virtualization of users, services, and networks to create realistic test conditions and accurate results.



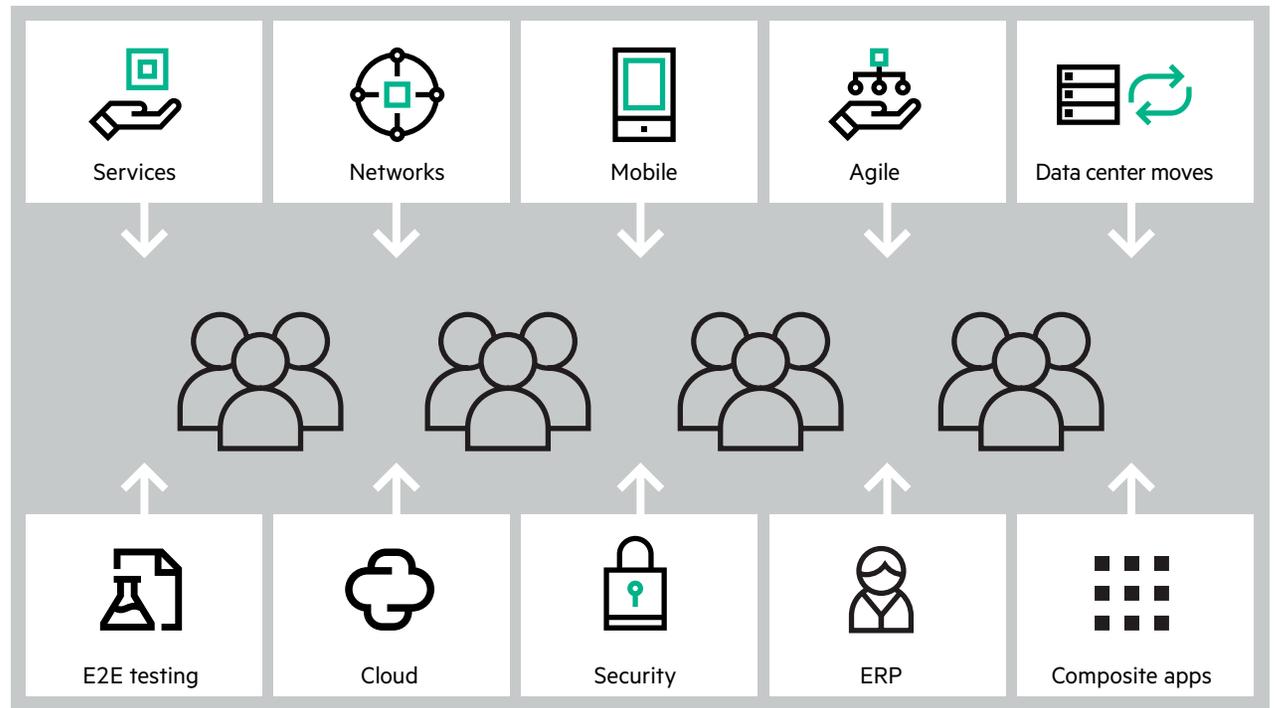
**Know before you deploy**

Hewlett Packard Enterprise service and network virtualization creates real-world conditions for testing business applications and verifying that they will perform to the expectations of end users.

**[Read the white paper.](#)**

# A storm of application challenges

The need for thorough testing of applications prior to rollout is well understood. But that is often easier said than done when you consider the storm of challenges that software delivery teams face. Here are some of those challenges that can impede the delivery of high-quality and stable applications.



**Figure 1.** Challenges to software delivery teams



### **Services**

The distributed nature of composite applications poses significant risk to development and testing teams. If there are dependencies on services that are not available or too costly when your developers and testers require access, the development and delivery process can slow down or, worse, be pursued in an incomplete and unreliable manner. This creates the need to virtualize services to create complete environments for the development, testing, and operations process.

### **Networks**

Network conditions, such as latency, bandwidth, packet loss, and jitter, must be taken into account when developing and testing software. Just as it is challenging and costly to bring real-world services into the test environment, the real-world networks affecting the backend infrastructure and the end user, and everything in between, represent a daunting task to incorporate into a test environment isolated behind a firewall. This reality creates the need for virtualized networks. When you test in development/testing/operations, how is the network representative of the production network?

### **Mobile**

Mobile applications run on endless combinations of devices in different locations on different and changing networks. Much of the performance of a mobile app is dependent on the network, so developers and testers must consider the effect of the mobile network on the end-user experience before deploying an application. Every millisecond of delay increases user abandonment, sends customers to competitors, and decreases the likelihood your customers will ever return.

As soon as you build a faster network, users will expect to see a corresponding increase in application speed and content. They also expect your apps to work seamlessly across devices and screen sizes. And your developers and testers must also take into account network variables, which can have a huge impact on mobile application performance. It is critical that your apps perform at their peak over the network by capturing or virtualizing real-world network conditions and using them in your test environment. How much is NOT doing this costing you today?



### **HPE Network Virtualization**

Learn how you can virtualize real-world network conditions in your software testing environment. [Read the data sheet.](#)

### **Agile**

Fast-moving agile development processes create testing challenges. You need to find ways to build testing into the entire agile development process, so you find and fix defects early on and throughout, when they are less costly to fix and less disruptive to timelines using automation. With each merge, changes to code and new features and functions demand an integrated and automated testing strategy. What parts of the workflow do you include in testing? How deeply do you test during each iteration? How early can you test a component? Do you have an automated performance regression test to validate key flows at predictive production levels prior to every release? Are you incorporating network virtualization to get realistic results with actionable code-level optimization recommendations built into your CI/CD process, or not?

### **Data center consolidations and relocations**

Data center consolidations and relocations can impact service levels in many ways. One example: Users who were previously local to the servers supporting their business applications may become remote users. You have to think about what happens outside of the data center, and how network connections from the end user to the data center are impacting the systems and the end-user experience.

Thirty-six percent of applications often exhibit worse performance after a data center relocation, despite upgrades in hardware—and if you are not prepared for it, a data center move can be a career-ending event. Applications need to be “future-proofed” against these types of network changes.

### **End-to-end testing**

It is not good enough to just test an application under certain virtual user loads in a test environment. You need to find ways to test the end-to-end performance of an application under different network and system conditions and various end-user scenarios. Technology teams today support hundreds of applications with dependencies on hundreds or more distributed services.

This complexity—and the required integration of dependencies and application resources—is placing a burden on development and QA teams responsible for testing and validating application performance. Traditional methods of development and delivery are no longer effective.



### **Cloud**

Migrating applications to hosted or cloud computing environments affects the end-user experience, often very significantly. Defining, measuring, and responding to application service level objectives (SLOs) in hosted, cloud configurations is a best practice to accurately assess and optimize performance before deployment. Three divides in the cloud—distributed services, within cloud host, and end users—introduce network conditions and affect application performance. Understanding your cloud environment and mitigating risks across each cloud divide are important steps to addressing this challenge.

### **Security**

It's back! So remember things like “cross-site scripting” and “SQL injection” from days past. With distributed systems (nearly all are today, including mobile, cloud, web, and big data), network conditions—such as latency, jitter, packet loss, and bandwidth—all play together. This requires your technology teams to build in “wait times.”

The result is vulnerabilities and risk being opened up, with even some of the old ones coming back as a result. They are just as bad, and just as nasty. How are you able to capture and recreate these conditions in your lab, so your applications are optimized and secure, bringing peace of mind to your business and customer?

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An enterprise-ready user virtualization capability with HPE Service Virtualization, and adding HPE Network Virtualization, enables you to mitigate your risk and go to production with confidence, while lowering development, testing, and infrastructure costs and speeding up release cycles.

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## Brochure



### **Getting started with mobile performance testing**

Learn about best practices and proven methodologies for mobile performance testing in a world of complex composite applications and systems.

**Watch the webinar.**

### **Enterprise resource planning (ERP) systems**

New enterprise applications often have to be integrated with complex legacy systems that hold enterprise data. This can be especially challenging if your development and testing teams cannot gain access to the enterprise systems and the data they hold.

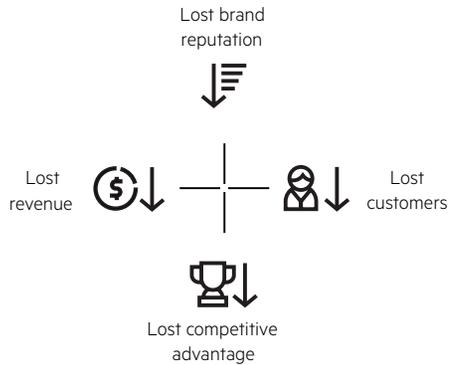
What happens when your ERP system, such as SAP or Oracle, is slow or offline? Is this just for you or all distributed users, and how are you validating these results prior to exposing your customers to this experience and the associated business impact?

### **Composite apps**

Today's applications are far more complex than those of the past. There are often many pieces that you do not control—such as shipping and payment card authorizations in an online retail application. All of these variables must be considered in the development and testing process.

These wide-ranging challenges complicate the application development and performance testing process. As a result, many inadequately tested applications and software updates go in production, which effectively turns users into testers. That's a dangerous proposition.

**Organizations that fail to fully test and optimize their applications do so at their own risk. Let us look at the potential business impacts of poor application performance.**



**Figure 2.** The costs of poor application performance

## The high costs of poor application performance

**In today's world, your business can perform no better than its applications.** When you roll out a new feature/function or revise a mobile app, there is a lot at stake. A poorly performing mobile app is likely to draw swift reprisals that come in the form of scathing reviews on app stores and social media sites. One study found that 29 percent of mobile users who have a poor online shopping experience are likely to complain on social media.<sup>1</sup>

### Poor performance is also likely to drive customers away.

**61%**

of users are unlikely to return to a site if they'd had trouble viewing it on a mobile device.<sup>2</sup>

**70%**

of mobile transaction response time stems from the network.

**37%**

of consumers will shop elsewhere if a mobile site or app fails to load in 3 seconds.<sup>3</sup>

**1 second**

is how long mobile devices have to respond to user input, in order to keep the user engaged.<sup>4</sup>

<sup>1</sup> Online survey conducted within the U.S. by Harris Interactive on behalf of Compuware APM, October 14–16, 2013.

<sup>2</sup> "Google Asks 'Are You Mobile Ready?'" Mobify, January 31, 2012.

<sup>3</sup> Online survey conducted within the U.S. by Harris Interactive on behalf of Compuware APM from October 14–16, 2013.

<sup>4</sup> Google, "Mobile Analysis in PageSpeed Insights," updated November 1, 2013.

<sup>5</sup> Theresa Lanowitz, founder of Voke, Inc., quoted in IT Knowledge Exchange, June 21, 2012.

"The software that runs your company is now inextricably linked to your brand. So your brand is reflected through the software you are putting out there; your brand is reflected through the software that your customers are using."<sup>5</sup>

– Voke, Inc.

“Network conditions affecting app performance must be tested. Network bandwidth and latency play a large role in the user’s overall experience of an app, and therefore real-world network testing, when possible, is preferable. Use network virtualization tools, such as those offered by Shunra [now HPE Network Virtualization], when testing on actual networks is impractical. These tools mimic real-world mobile network conditions that quickly show what environments will prohibit an app from responding to input in less than one second.”<sup>6</sup>

– Forrester Research

## Essential capabilities for delivering high-quality applications

**High-quality application performance does not happen by chance.** It results from a laser-sharp focus on testing against realistic user, system, and network conditions throughout the development process. These efforts require multiple, integrated, and automated capabilities that developers and testers leverage to deliver thoroughly tested, high-quality applications into the production environment.

**Virtualization is one of the overarching keys to success.** To accurately test your software in a pre-production environment, you need the ability to virtualize users, networks, and services. Virtualization gives you the confidence that your application is ready for the actual conditions of a production environment.

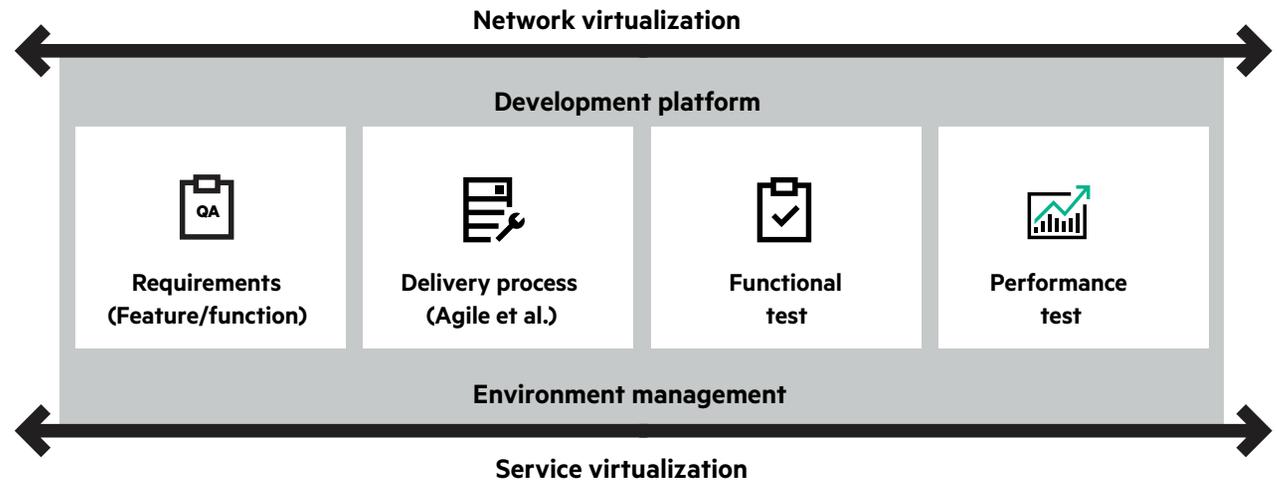


Figure 3. Key capabilities

<sup>6</sup> Forrester Research, “A Benchmark to Drive Mobile Test Quality,” by Michael Facemire and Rowan Curran, February 20, 2014.

**HPE is the only company with a complete, integrated, end-to-end, enterprise-proven solution for taking control of application performance prior to production.**

## How HPE can get you there

The HPE portfolio covers the full range of development, testing, virtualization, and management capabilities. This is the only portfolio giving you the integrated set of enterprise-proven capabilities you need to work proactively to take control of performance before an application or update goes into production, and deliver the expected results for your business and customers.

What you need	What HPE delivers	How it helps you
Requirements and test management	HPE Quality Center	Achieve consistent IT quality management processes and software quality assurance.
Project management	HPE Agile Manager	Organize, plan, and execute agile software development projects.
Mobile development platform	HPE Anywhere	Leverage an intuitive mobile app development platform built for enterprise challenges.
Functional testing	HPE Unified Functional Testing	Automate functional and regression testing for composite applications and services.
Performance management	HPE Performance Center	Test the performance of any application through a globally accessible platform for sharing best practices and resources.
	HPE LoadRunner	Gain an accurate picture of end-to-end application performance before going live.
Network virtualization	HPE Network Virtualization for Mobile	Leverage a standalone capability to optimize your mobile apps for your customers today with automated optimization recommendations within four hours.
	HPE Network Virtualization	Leverage integrated capabilities to discover, test, and optimize your systems now, increasing the value from your HPE investment and maximizing your ROI.
Service virtualization	HPE Service Virtualization	Create, develop, and test software against virtual services that simulate real service behavior.

## Here is the bottom line

When it comes to the functionality and performance of the applications your business and customers rely upon, you cannot afford to take chances. You need to validate the applications against realistic, end-to-end conditions before they go into production. With the HPE portfolio, you can make it happen, and make it matter.

Learn more at

**[saas.hpe.com/software/network-virtualization](https://saas.hpe.com/software/network-virtualization)**

**[saas.hpe.com/software/service-virtualization](https://saas.hpe.com/software/service-virtualization)**



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