A complete view of the application delivery chain (ADC) is required to optimize the performance and availability of today’s modern web, non-web, mobile, streaming and cloud-based applications.

Achieving this complete view requires integrating multiple approaches and instrumentation across the ADC. This allows you to measure the end-user experience, and all of the underlying infrastructure, to proactively detect performance issues, quantify their business impacts and accelerate resolution.

There are two complementary approaches to measuring end-user experience:

• **Real-user monitoring** collects data on real users’ actual experiences and behaviors as they interact with your web and mobile applications.

• **Synthetic monitoring** uses geographically dispersed agents to collect performance data from scheduled tests that simulate the way users interact with your web and mobile applications.

Organizations with mature application performance management (APM) capabilities use a combination of these approaches to have broad end-user experience visibility and deep-dive diagnostic capabilities across the entire ADC. The purpose of this paper is to highlight the many benefits in utilizing synthetic monitoring.

**THE TOP 10 REASONS WHY YOU NEED SYNTHETIC MONITORING**

1.) Test from the end-user perspective at every stage of development: Unify your application performance lifecycle.

2.) Monitor your site’s availability and end-to-end performance 24/7 — even during low-traffic periods.

3.) Understand the performance impact of third parties.

4.) Objectively measure service-level agreements (SLAs).

5.) Troubleshoot problems precisely using actionable, detailed, object-level metrics and diagnostics.

6.) Baseline and analyze performance trends across geographies.

7.) Benchmark your performance versus the competition.

8.) Test performance in advance of entering a new market.

9.) Quantify the performance and business benefits of technology investments.

10.) Attain mature APM capabilities with this essential monitoring approach.

**NUMBER ONE**

**TEST FROM THE END-USER PERSPECTIVE AT EVERY STAGE OF DEVELOPMENT: UNIFY YOUR APPLICATION PERFORMANCE LIFECYCLE**

Using synthetic monitoring you can proactively test your web, non-web, mobile, streaming and cloud-based applications in pre-production to ensure performance will meet your end users’ requirements. The pre-production test results can be used as a baseline and to set alert thresholds for performance when live in production in order to monitor performance and ensure optimum end-user experience.

Synthetic tests can be executed to match the profile and perspective of your end users, globally in all locations, across multiple real browsers and devices, for broadband or dial-up, all applications and for streaming media. This is accomplished through a combination of running synthetic tests from consumer-grade desktops on the “edge of the Internet;” behind local ISPs and mobile carriers; from enterprise-grade servers running on the Internet backbone; and from private agents located anywhere inside or outside your firewall.
Synthetic monitoring is beneficial for any stage of development, from the launch of a completely new application or website to minor functionality and/or content (internal or third-party component) updates.

Using synthetic monitoring across multiple stages of development helps unify your application performance lifecycle — breaking down the walls between development, QA and operations teams by giving them a common set of tools, metrics and diagnostics.

**NUMBER TWO**

**MONITOR YOUR SITE’S AVAILABILITY AND END-TO-END PERFORMANCE 24/7 — EVEN DURING LOW-TRAFFIC PERIODS**

Performance problems can occur anywhere across today’s complex ADC — from the browser on a real user’s computer or mobile device, across the Internet or a corporate WAN, across third-party and cloud providers, to the infrastructure running inside data centers.

With synthetic monitoring, you can measure application performance 24/7 from every vantage point across the ADC and be alerted to issues before customers are affected.

If an issue arises during off-hours, or other low-traffic periods, you need to quickly identify, isolate and resolve the problem to protect revenue and brand reputation.

**NUMBER THREE**

**UNDERSTAND THE PERFORMANCE IMPACT OF THIRD PARTIES**

To provide rich customer experiences, web applications and websites increasingly depend on third-party components such as shopping carts, ads, customer reviews, web analytics, social networking, search engine optimization, video and many more. In fact, the average web site typically includes components from eight or more different hosts.

These components help drive traffic, increase conversions and improve customer satisfaction, but any one component could weaken your site’s overall performance or even take it down. While SLAs may let you point the finger, from the end-user point of view, you’re the one who’s accountable.

Using synthetic monitoring, you can test components before launch in multiple phases and under various conditions, including pre-production testing for proof of concept and load testing that evaluates performance under conditions similar to what may be expected on your site and during high-traffic periods.
OBJECTIVELY MEASURE SERVICE-LEVEL AGREEMENTS

Managing SLAs is very important today as so many companies rely on third-party vendors to host all or parts of their applications. Synthetic monitoring can be used to ensure quality service delivery, accelerate problem identification, protect customer experiences and report on the compliance of internal or external providers.

Synthetic monitoring provides objective, stable and predictable performance measurements that facilitate alignment between IT, business stakeholders and third parties. Synthetic monitoring can also be used to validate performance prior to creating an SLA and to ensure consistent delivery of services over the lifetime of the relationship.

NUMBER FIVE

TROUBLESHOOT PROBLEMS PRECISELY USING ACTIONABLE, DETAILED, OBJECT-LEVEL METRICS AND DIAGNOSTICS

Having deep-dive diagnostic capabilities is required to be able to rapidly identify the root cause of an issue and resolve it. Synthetic monitoring provides a rich set of diagnostic data you need to debug problems anywhere across the ADC.

With synthetic monitoring you can troubleshoot with accuracy using detailed object-level, page, connection and host data across multiple browsers. It provides detailed diagnostics including DNS, connect time, SSL, first byte and content download times and errors, for every object on every page, and stored for postmortem and routine review.

Running synthetic tests from end-user computers — the last mile — allows troubleshooting of ISPs and uncovering peering issues with regional ISPs.

Figure 4: Synthetic monitoring can be used to monitor SLAs for all vendors. In this instance, an ad vendor shows a marked degradation in performance.

Figure 5: This chart shows a component breakdown of a transaction’s average response time.

Figure 6: Leverage object-level detail across mobile and websites, native mobile applications and SMS initiatives to identify and resolve issues before your customers are impacted.
NUMBER SEVEN

BENCHMARK YOUR PERFORMANCE VERSUS THE COMPETITION

Benchmarking using synthetic monitoring provides valuable insight into how market leaders and the competition are performing. It also provides a context for shared goal-setting between IT and business mobile and website stakeholders to improve business results, and as a tool for measuring performance over time.

Figure 8: With synthetic monitoring, you can benchmark performance over time versus top competitors.

Figure 9: With synthetic monitoring, you can benchmark performance in key geographies versus top competitors.

NUMBER SIX

BASELINE AND ANALYZE PERFORMANCE TRENDS ACROSS GEOGRAPHIES

Baselining and analyzing performance using synthetic monitoring is considered a best practice to improve application performance and end-user experience.

Synthetic monitoring provides a stable and consistent environment to measure performance at all hours of the day, over a period of weeks or months. With synthetic monitoring, baseline tests can be set up to mirror the way your end users access your applications. These baselines tests can monitor key transactions and geographic locations, while testing from multiple browsers and devices.

Armed with this data you can assess if you are meeting requirements, identify and measure areas to improve and use the data for capacity planning.

Using established synthetic monitoring baseline metrics before entering an SLA gives you concrete data with which to negotiate and monitor going forward.

Figure 7: With synthetic monitoring, you can baseline performance across key geographies.
NUMBER EIGHT
TEST PERFORMANCE IN ADVANCE OF ENTERING A NEW MARKET

When entering a new market or launching a new marketing campaign, it is important to know if performance and customer experience could impact the achievement of business goals.

Synthetic monitoring allows you to test first, and then identify and fix problems before deployment in key localities or new regions with real-world variables, such as connection speeds (dial-up, DSL, cable broadband, fiber optics, etc.), before users arrive.

Synthetic monitoring also can be used to simulate high-volume, real-world load to ensure your applications can handle the projected increase in traffic.

NUMBER NINE
QUANTIFY THE PERFORMANCE AND BUSINESS BENEFITS OF TECHNOLOGY INVESTMENTS

Synthetic monitoring is a valuable tool to help select, configure and optimize the performance of technology investments. With synthetic monitoring, you can test new technologies in a pre-production environment; for example, content delivery networks (CDNs), cloud, virtualization and infrastructure.

As an example, for CDN selection you can use synthetic monitoring to measure before-and-after performance differences. Synthetic tests can be run and compared from the Internet backbone and real end-user desktops to ensure the CDN delivers the required performance benefits. Synthetic monitoring also can be used to predict whether you will need a CDN when entering a new market.

Figure 10: With synthetic monitoring, you can test performance before entering a new market; in this example, expanding from the U.S. to the European market.

Figure 11: Synthetic tests run from the Internet backbone would indicate that CDN B provides the best increase in performance.

Figure 12: The same tests run from real consumer-grade desktops at the edge of the Internet indicate that CDN B actually has worse and less consistent performance.

Similarly, synthetic monitoring can be used to measure before-and-after performance when upgrading or implementing virtual infrastructures, consolidating data centers and migrating servers.

In addition, synthetic tests can be used to estimate required capacity going forward by simulating load.
NUMBER TEN

ATTAIN MATURE APM CAPABILITIES WITH THIS ESSENTIAL MONITORING APPROACH

APM requires a strategic and evolutionary approach, with solutions focused on improving how companies actually manage applications and end-user experience — not just providing more data under the banner of “visibility.”

Given the complexity in managing the performance of applications today, achieving APM maturity requires multiple integrated approaches and instrumentations across the entire ADC.

Organizations with mature APM capabilities combine synthetic monitoring with real-user monitoring on a common platform to have broad end-user experience visibility and deep-dive diagnostic capabilities across the entire ADC.

As covered in this paper, synthetic monitoring allows you to proactively monitor, troubleshoot and optimize the performance and availability of all your applications. Real-user monitoring complements synthetic monitoring, providing insights into how the data observed with synthetic monitoring impacts your real end users; for example, user satisfaction and conversion rates.

In addition, real-user monitoring measures all aspects of your users’ experiences, including user location, browser, ISP, device and all application infrastructure components. With real-user monitoring, you can quantify performance problems by business impact for rapid isolation and resolution.

ABOUT COMPUWARE APM

Compuware APM is the leader in a new generation of application performance management. Unlike traditional APM solutions that are heavy, difficult and reactive, Compuware APM is light, smart and proactive. Compuware APM is built to manage the complexity of today’s most challenging modern applications including mobile, cloud, Big Data and SOA. Compuware APM optimizes and monitors tens of thousands of applications for more than 4,000 customers, large and small, around the globe. Through the lens of end-user experience, our customers enjoy faster performance, proactive problem resolution, accelerated time-to-market and reduced application management costs through smarter analytics, advanced APM automation and a unique performance lifecycle foundation. Compuware is recognized as a leader in the “Magic Quadrant for Application Performance Monitoring” report.

To learn more about Compuware APM, please visit: 
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