

# Making Sense of Digital Experience Monitoring Solutions

We break down the differences between synthetic monitoring, real user monitoring and web performance optimization — each solution helps drive web performance.



Customers demand and depend on fast, reliable web services. Slow digital experiences don't just reflect poorly on your brand — they can also impact your bottom line. In today's increasingly competitive business landscape, having a digital presence alone is not enough.

It's clear that web performance should be a key component of business strategy, but how do you stay on top of your digital experience?

Digital experience monitoring (DEM) is a customer-centric approach to observability that helps businesses identify and respond to any issues that might impact their user's engagement with their website or app. But there are different types of monitoring, so it's important to know the benefits associated with each and how you can choose the one that best meets your business needs.

This paper will:

- Describe and outline the benefits of both synthetic monitoring and real user monitoring (RUM).
- Explain the value of implementing digital experience optimization tools.
- Help you understand how to assess which digital experience solutions are best for your business goals.

## Application performance monitoring (APM)

Before we dive into the topic of back-end and front-end monitoring, it's important to lay the proper groundwork. Application performance monitoring (APM) is part of an overall market of products that monitor the performance of software. This market initially revolved around identifying bottlenecks associated with the various components of an application's infrastructure.

An infrastructure and content evolution over the last 20 years has contributed significantly to the need for testing and monitoring the performance of all aspects of the delivery of website content and application services.

As the hardware that supports the web has become more powerful, robust and commoditized, the content and the systems that deliver it have also grown more complex. That complexity has touched every aspect of software, including operating systems, application

servers, third-party utilities and the “middleware” that glues them all together. At its core, the APM market consists of toolsets that keep track of the efficiency of the servers, networks, software and storage that comprise modern applications.

The goal of these tools is to identify any issues that may arise when data is transferred or computed within any of these systems.

Modern APM tools have added visibility into end-user experiences over the network and through web browsers. Therefore, we can classify monitoring into two primary groups: **back-end monitoring** and **front-end monitoring**.

### Back-end monitoring

Back-end monitoring provides visibility into the performance of a client's infrastructure. It focuses on databases, web server software such as HTTP, SSL, and application server software such as PHP, Ruby or Java. The performance of database software, third-party APIs, internal API services and other bits of code that ensure information gets from the server to the user and vice versa are all the domain of back-end monitoring.

### Front-end monitoring

Front-end monitoring gives the finished view of the performance of your web application from the perspective of an end user and encompasses all third-party content. Front-end monitoring provides insight into what your users experience when they visit your website. This experience varies dramatically based on the device, network, location, browser and a host of other variables.

Back-end Monitoring	Front-end Monitoring
Back-end and front-end monitoring provide visibility into...	
Code bugs	Third-party content
System problems (operating systems issues, security issues)	Web page structure, organization and weight
Hardware problems (CPU failure, disk failure, out of disk space)	Location, network or browser-related performance problems
Software performance problems	Troubleshooting the effectiveness of mobile sites or responsive design

## Synthetic monitoring

Synthetic monitoring is one type of front-end monitoring that tests and measures the digital experience of web applications by simulating traffic with set test variables (e.g. network, browser, location, device). Synthetic vendors provide remote (often global) infrastructure that visits a website periodically and records the performance data for each run. The measured traffic is not of actual users, but rather traffic synthetically generated to collect data on page performance.

Behavioral scripts (or paths) are created to simulate a flow that a customer or end user would take on a site. Those paths are then continuously monitored at specified intervals for performance indicators such as functionality, availability and response time.

## Real user monitoring (RUM)

The other type of front-end monitoring is real user monitoring (RUM), which monitors an application’s actual user interactions. RUM vendors provide a JavaScript tag that tracks the user’s interactions with their site and reports metrics such as response time, server time, the user’s location and the user’s device.

## Benefits of front-end monitoring solutions

### Benefits of synthetic monitoring

By using a set of controlled variables (geography, network, device, browser, cached vs. uncached), synthetic monitoring, commonly referred to as “lab

data,” eliminates much of the noise that is reported with RUM. As a result, latency and downtime can be promptly identified, and root causes of performance issues can be isolated and diagnosed.

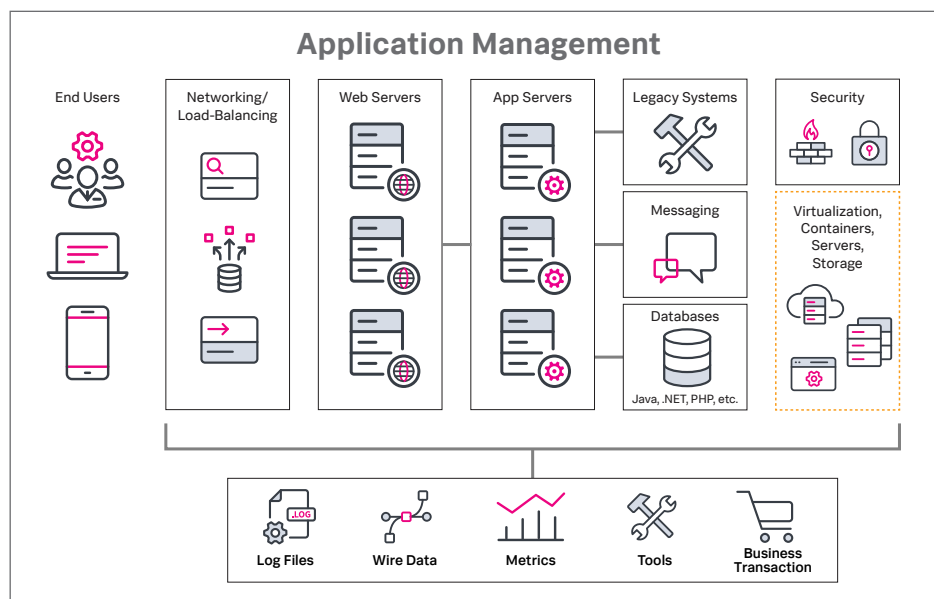
It can be difficult to isolate or control the impact that variables have on load time with RUM solutions. Synthetic monitoring tools, on the other hand, let you create a consistent baseline. This means synthetic monitoring is preferable for identifying the cause of performance regression.

Moreover, synthetic monitoring tools generate waterfall charts for every monitoring run. These charts provide full page asset load times, thus attributing every millisecond of load time to a piece of web content. This helps teams, for instance, understand the impact of using new ad providers, content delivery networks or marketing analytics plug-ins.

It’s important to identify and fix performance defects before they are live. By using synthetic monitoring to test websites and web applications in pre-production, teams can identify any potential hangups, baseline performance and set alert thresholds for when applications are live.

### Benefits of RUM

Unlike synthetic monitoring, RUM, otherwise known as “field data,” captures the experience of actual users regardless of their devices, browsers or geography. Because there is no need to pre-define important use cases, RUM is great for generating reports and



analyzing trends. As users go through the application, all of the performance timings are captured. So, no matter what pages they see, performance data is available for analysis. This is particularly important for large sites or complex apps, where the functionality or content is constantly changing.

By leveraging RUM, a business can better understand its users and identify areas on its site that require the most attention. Also, RUM can highlight the geographic or channel distribution trends of users. This can help organizations as they define business plans and performance targets.

Summary of Synthetic Benefits:	Summary of RUM Benefits:
<ul style="list-style-type: none"> <li>• Quick and easy setup that doesn't require adding any extra code to your site</li> <li>• Gain visibility into all front-end content, including third-party content</li> <li>• Continuous monitoring provides insight into site performance — even during off-hours or periods of low traffic</li> <li>• Test performance in pre-production to confidently deploy updates</li> <li>• Easily measure your performance KPIs against your competition</li> </ul>	<ul style="list-style-type: none"> <li>• Understand how your application is being used</li> <li>• Gain visibility into real geographic user distribution and how it affects their experience</li> <li>• Understand network or channel distribution and user flow</li> <li>• Ensure full visibility of application usage and performance</li> <li>• Correlates real-world performance with business KPIs, such as eCommerce revenue gains or losses</li> </ul>

## Web performance optimization

Monitoring provides valuable knowledge about website performance, but this is only part of the equation. The future of performance management lies with web performance optimization tools that automatically identify the cause of performance regression and provide insight into how best to respond to performance “defects.”

Web performance optimization tools help diagnose and hone the performance of a web application or website to improve the end user's experience. These tools help solve the problem of having a lot of performance data, but not knowing what to do next. They interact with your web application or website to find and bring attention to performance problems in the design, content or layout of your application. They also tell you the specific things that are wrong with your site and what you should do to fix them.

### Web performance optimization tools have two major use cases

#### 1. Eliminate defects

These tools can help teams understand what specific defects exist so they can be triaged and addressed. These defects could relate to a range of issues, including configuration, design, content or infrastructure. Using optimization tools in an ad hoc manner provides site owners with a list of tasks to make the site faster but doesn't necessarily leverage these tools in the best way possible.

#### 2. Prioritize performance in the development process

The second, and more powerful, use case for optimization tools is to use them as part of the



The waterfall chart displays every asset on a website as it loads at its individual times. This chart is one of the benefits of synthetic monitoring as it helps teams better understand the causes of performance regressions.

development process. QA teams don't just undertake functional testing once or twice a year. In fact, more mature organizations automate their functional testing to provide continuous coverage and act as a safety net against new bugs slipping into production.

Organizations should do the same thing to prevent performance problems from slipping into production. Digital experience optimization tools, when part of the development process, can shine a light on performance issues before they are live. This equips teams to address them like they would any other bug.

### Kicking off performance optimization efforts

It is clear that there are benefits associated with synthetic monitoring, RUM and digital experience optimization, but where should an organization start?

Smaller businesses or those who are new to performance monitoring and optimization should start with a tool that allows them to baseline performance, identify trends and receive insights into how they can proactively improve performance.

Free and open source tools like PageSpeed and YSlow look for a few dozen common front-end performance issues. Splunk Synthetic Monitoring also offers a free report that tests your site for several hundred common front-end performance issues.

These free offerings can help with diagnostics, but aren't suitable for fully implementing continuous performance auditing in the development process. Splunk Web Optimization is another cost-effective option for establishing performance trends, and it provides step-by-step directions on how to address nearly 300 performance-related defects.

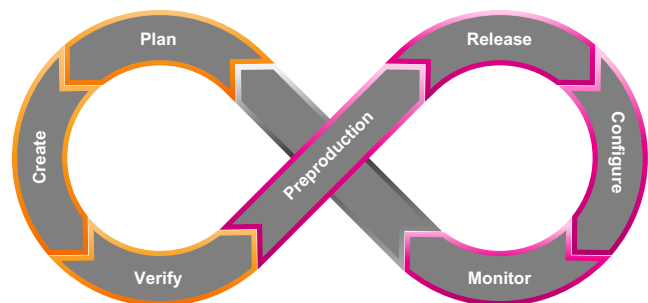
### Next steps: Combining web optimization and synthetic monitoring

Adding synthetic monitoring to optimization is a great next step. When compared to RUM, synthetic monitoring provides a cleaner baseline for identifying performance regression and performing root-cause analysis should problems arise later on. Teams can also use synthetic monitoring in pre-production environments and integrate it into the development process. In this use case, combining optimization and synthetic monitoring can be extremely powerful, equipping teams to identify defects, test resolutions and conduct A/B testing before launching updates.

## Building great customer experiences requires complete DEM solutions

Organizations looking to get the most out of their DEM should use a combination of optimization, synthetic monitoring and RUM solutions.

Digital experience monitoring provides the most robust picture of the end user's experience. In addition to the benefits realized through optimization and synthetic monitoring, RUM can help tie real-world website performance to business KPIs. RUM results can also provide information to help evaluate the ROI of synthetic monitoring systems as pre-production testing eliminates performance problems and service disruptions from the later stages of the software development lifecycle.



Splunk DEM helps integrate experience monitoring into the whole software development lifecycle.

### Performance wins

By using both a comprehensive digital experience monitoring and optimization solution, organizations can:

- Improve time-to-interactive across all properties by 33%.
- Reduce third-party resources from 35 to 25.
- Create consistent reporting across the organization.
- Gain control over performance goals and budget.

## Evaluating a solution

There are many factors to consider when choosing a monitoring solution. Here are some guidelines to consider when selecting the one that is best for your business:

### 1. Match your purchase to your problem:

It's easy to get bogged down in features that you don't need. Ask yourself the simple question, "Does this solution solve my problem?" If the answer is no, move on.

### 2. Avoid feature-to-feature comparisons:

Comparing features will be like comparing apples to oranges, so take the big picture approach to evaluate overall value and the total package.

### 3. Consider support for key business results:

Are you an eCommerce site owner who needs insight into conversion rates, or are you a SaaS provider who needs to monitor your SLAs? Make sure the solution you choose can support the KPIs you want to monitor and improve.

### 4. Look for a tool with actionable insights:

Do you need to reduce the render time of your web app to drive more conversions? Great! Look for a tool that provides actionable insights and recommendations. If your solution monitors the problem, but it doesn't help you improve it, then it doesn't align with your business needs.

### 5. Treat the complexity of the solution as a feature:

How quickly can a solution be implemented and how soon can you expect to receive value? What's the total cost of ownership — does it require professional services to implement and manage? Is support included in the cost? Does the vendor have references to validate its customer service?

Digital experience monitoring and optimization tools are essential for businesses that want to understand the performance of their web applications from the perspective of an end user and know how to respond. Without monitoring, businesses don't know what they don't know — they are guessing about how best to improve their user's experience.

Optimization provides actionable insights to address defects, delivering the best possible user experience.

## Get started

DEM helps drive great customer experience and business outcome through RUM (field data), synthetics (lab data), and insight into web performance optimization best practices. Consider all of the above as you look for partners in observability.

Visit [splunk.com/devops](https://splunk.com/devops) to learn more about how you and your organizations can maintain the highest levels of business performance, minimize downtime and deliver world-class digital experiences.



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