

# Application Performance Management (APM): The essential tool for developing, deploying, and optimizing government applications

## The challenge of digital government

The role of information technology in government is rapidly changing. Until recently, IT has primarily served as a supporting cast member by providing the federal workforce with communications, office support, and back-end management systems. But in today's emerging app-centric economy, the end user has become the key focus of companies and governments alike. Consequently, IT is fast becoming a primary means of executing the government's vast array of missions, including delivering vital intelligence to warfighters, delivering medical care to veterans, processing visa applications, assisting taxpayers, issuing weather alerts, conducting postal commerce, or dispensing disaster recovery assistance. In short, interactions between the government and its citizens and constituents are occurring on countless smart phones, tablets, laptops, desktops, and back-end interconnected systems.

This sea change was anticipated in the White House's 2012 Digital Government Strategy, *Building a 21st Century Platform to Better Serve the American People*. "Today's amazing mix of cloud computing, ever-smarter mobile devices, and collaboration tools is changing the consumer landscape and bleeding into government as both an opportunity and a challenge," the Digital Government Strategy says. "New expectations require the Federal Government to be ready to deliver and receive digital information and services anytime, anywhere and on any device." Federal agencies are increasingly running on complex apps and, consequently, mission success is increasingly reliant on well-designed and executed software applications.

This new digital environment — enabled by cloud technologies, data center consolidations, virtualization, mobile technologies, agile development, and other aspects of IT modernization — also creates difficult challenges. Many agencies struggle to manage and optimize the growing number of interdependent mission-critical applications within their infrastructure. That's because traditional approaches used by agencies to monitor, measure, and improve IT performance must be rethought in order to keep pace with today's complex dynamic architectures. Most monitoring capabilities focus on individual silos within the IT infrastructure — for example, databases, networks, servers, operating systems, etc. — and not on an app user's journey from start to finish. Similarly, they do not effectively measure how an application's performance impacts overall mission success.

This means federal program managers and mission executives lack the required insight into why their applications may be under-performing or how they could optimize them to achieve better mission results. Moreover, they lack the ability to adapt and optimize their applications to more complex, distributed, and dynamic environments, such as cloud, shared services or consolidated data center environments.

For IT operations staffs, the result is a poor understanding of the user experience. Citizens, federal employees, and other users may struggle for days with an underperforming application, but the operations staff may not find out until the complaints start rolling in. And once a problem is discovered, it may take hours to pinpoint the root cause and fix it, often at great cost in terms of wasted staff time and tax dollars that have been redirected from the core mission.

For application development teams, silo-based monitoring approaches can hamper the effectiveness of any efforts to embrace Agile development and a DevOps culture, which are predicated upon a tight working relationship and shared responsibilities between development and operations teams. Developers rely on robust information exchange from the Ops teams to understand how applications in production are behaving so they can optimize specific performance features and handle bugs within the software as they iterate rapidly. With this shortened development cycle, they face critical blind spots if Ops teams can monitor application performance only through the fragmented reports they receive on each silo of the IT infrastructure.

## Optimizing application performance

Federal agencies can overcome the challenges of today's application-centric environment with a capability called Application Performance Management (APM). APM solutions extract, collect, and analyze a wide variety of software signals, events, and metrics surrounding an application and its supporting IT infrastructure, providing keen insights for improving operational efficiencies and user experience.

How does it work? APM solutions instrument code, both on the back-end components as well as the front-end user browsers and devices, and can be deployed to present a complete and real-time view of how an application is responding to each user's interaction and how that application's surrounding IT infrastructure is responding to that application. That data is conveyed graphically on an interactive dashboard that an IT operator can use to manage the infrastructure, identify issues, and pass relevant depth to additional teams, including Development, QA/Test, 3rd party providers, and service providers. At the same time, some APM solutions establish baselines of normal behaviors for application components and their interactions within the IT environment. Once baselines are established, a robust and effective APM platform will monitor a wide array of performance metrics and conduct these most essential functions on a continual basis:

- Count the number of application transactions at all times — peak and off-peak — to assess throughput performance.
- Measure response times and errors of those transactions to gauge performance as experienced by the end user.
- Compare the data against automatically established baselines to understand immediately if there are problems — abnormal behavior — needing attention.
- Alert the operations team when abnormal behavior is detected and provides contextual data to expedite the remedy.

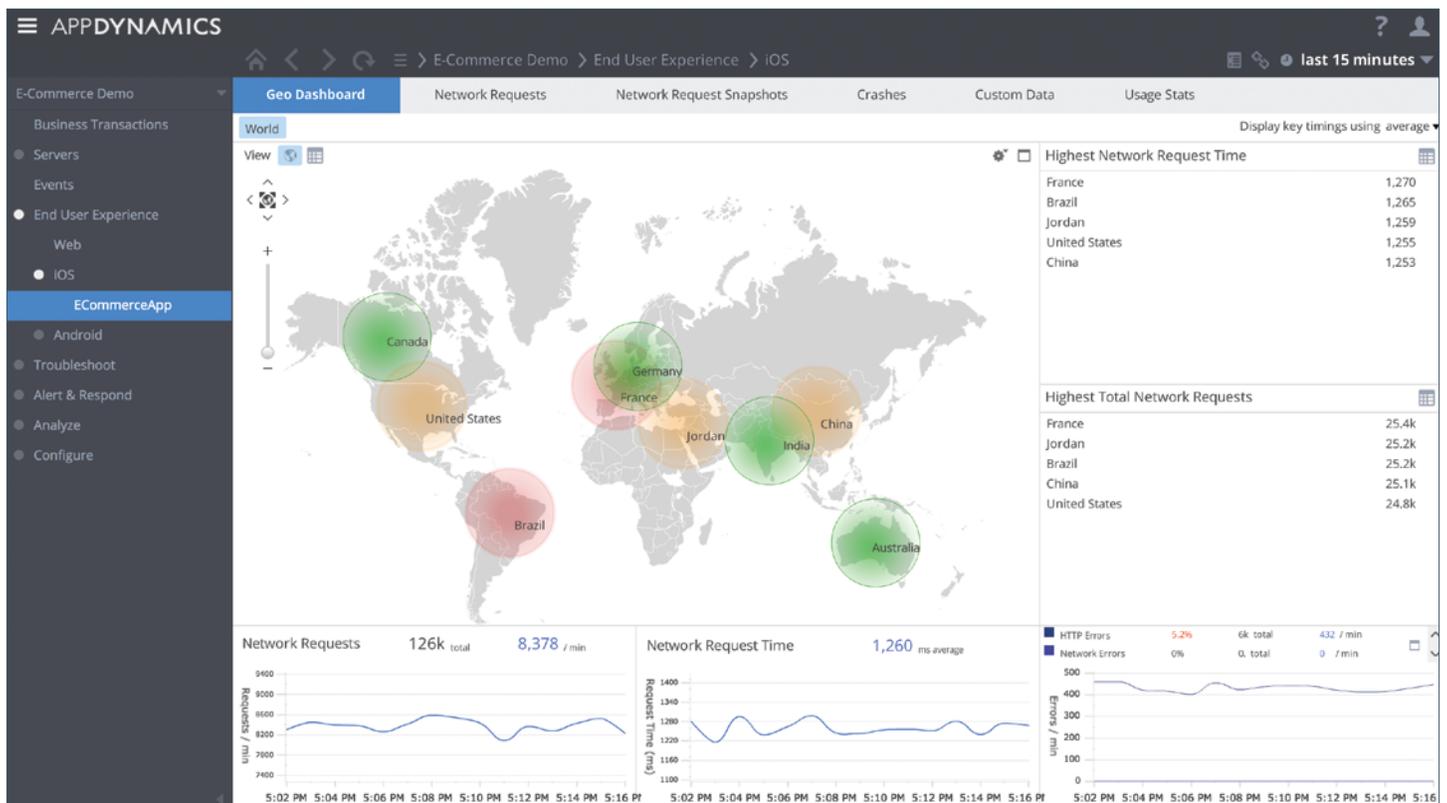


Figure 1 End-User Experience Monitoring: APM shows the response times and errors that end users throughout the world are seeing on their devices.

A mature APM solution enables organizations to quickly spot and fix performance problems, often before they prompt end-user complaints. This is accomplished with interactive dashboards provided by some APM solutions to determine where the problem resides. APM solutions, for example, can spot anomalies in the application code or within the application server, the host operating system and databases. But if a problem exists in another silo, such as infrastructure, the specialists on those teams employ silo-based monitoring and management tools to find the root cause of the problem. This ability to monitor code at such depth and breadth so as to identify and fix problems at the application layer or within the IT environment, whether that code is your own or a third party's, is what separates APM from tools that only monitor. Organizations should look for APM solutions that can do all of this regardless of the language the transactions are being conducted in, whether Java, Node.js, .NET, PHP or Python.

In addition, a robust APM solution can map out the path of every transaction as it traverses the distributed application components, including servers, databases, caches, queues, and third-party services. Having a clear picture of this path helps IT teams more efficiently configure their applications and IT environments for optimal performance.

## APM: The key to digital government

APM enables federal organizations to overcome the challenges of digital government and, equally important, seize its transformative opportunities. These opportunities include:

### Deploying digital services

Three key federal constituencies that stand to gain the most from APM's capabilities are IT operators, developers, and program managers — the key players responsible for defining, developing, and deploying mission-focused applications.

Program managers define the mission requirements and metrics for success, which developers then use to build applications. IT Ops teams release those apps to production where IT operations teams maintain and troubleshoot them when things go wrong. Ops teams also provide dashboards, reports, and other performance feedback to the program managers to help them assess the application's impact on the broader mission.

Throughout this cycle, some of today's APM solutions can track and analyze application performance data and present it efficiently and simply to all stakeholders, without the need for expert assistance. This capability empowers all three constituencies for success.

#### APM EMPOWERS THE ENTIRE AGENCY

APM delivers operational and mission value to:

##### Program Managers

- Better mission effectiveness due to higher-performing applications and improved evidence-based decision-making to manage application performance
- Less risk, greater visibility, and improved application performance with cloud migrations, data center consolidations, mobile deployments, and shared services environments
- More successful citizen engagements
- Greater insight into how applications are addressing mission requirements
- Reduced "reputational" risk associated with the failure of high-profile applications
- Reduced need for help desk support

##### IT Development Teams

- Faster, more efficient, and higher-quality custom app development and deployment resulting from keener insights into an application's performance and interactions within its IT environment
- Better analytics to understand how multiple releases compare to each other
- Quicker root cause analysis, which is especially useful in agile development environments
- Less time spent on troubleshooting problems in production

##### IT Operations Teams

- Higher user satisfaction due to faster MTTR
- Increased efficiency of IT ops staff resources, allowing more resources to address emerging issues before they impact mission
- A more efficient IT infrastructure due to increased visibility into where inefficiencies exist

## Fixing performance problems, fast!

Most enterprises rely on silo-based monitoring tools to inform them of the health and availability of their infrastructure components, such as networks, databases, servers, and storage arrays. While this approach works well for understanding the performance of specific components, it is poorly suited to tracking the entire transactional flow of an application across all components. Consequently, when an application is failing or responding slowly or with errors, an application-focused monitoring approach that can view performance metrics across all silos along the application's transactional path is best suited to quickly identifying where problems exist. Once the source of a problem is identified, then APM diagnostics can often identify the root cause or else silo-based tools can be used to further correct the issues.

This ability means that APM can dramatically cut the time and resources needed to fix a problem — known as mean time to resolution, or MTTR. This is especially crucial for time-sensitive or mission-sensitive applications that operate in highly distributed and complex IT infrastructures with many variables at play.

Some APM solutions alert IT staffs when and where performance issues occur via email, text or an event open ticket on an IT Service Management platform. By dramatically speeding up MTTR, APM can minimize the impact of a poor-performing application on the end user, whether it's a citizen applying for a benefit, a veteran awaiting instructions for care, a logistician processing a part delivery in a combat zone, or a flood victim seeking assistance. Reducing MTTR translates directly into improved mission success, cost avoidance, and more staff time focused on the mission instead of on troubleshooting.

## Migrating to the cloud and other new environments

Migrating IT infrastructure and applications to new environments, such as private or public cloud, consolidated data centers, and shared service centers carries inherent risk. For example, many federal executives worry that critical applications and capabilities will degrade in the course of a cloud migration. APM helps mitigate that risk by providing application owners with complete visibility into end-user experience.

## Facilitating a healthy DevOps culture

APM helps development and operations teams get on the same page, which is critical for federal organizations striving to transform their IT staffs into fast-paced, agile, mission-focused organizations. One challenge is that development and operations teams typically speak different languages. Developers typically converse in code, while operators focus on infrastructure metrics such as availability, capacity, and response metrics. Log data is used across both teams, which is often the stepping-off point for basic application visibility. APM's focus on measuring and analyzing application performance at the user and transaction level provides a common bridge of communications for the development and operations teams, helping them integrate and work in a more agile method, being able to respond to changes in the requirements as they incrementally improve application functionality.

## Conclusion

As federal agencies move to modernize their IT environments and achieve the promise of digital government, digital applications are emerging as the modern-day workhorses of federal mission delivery. But application-centric operations and services also require enhanced capabilities to develop, deploy, and manage applications in increasingly complex IT environments. Without the ability to efficiently monitor and manage application performance, agencies cannot ensure the swift and effective delivery of information and services to the citizens, federal employees, and warfighters who depend on those applications. The business of government will slow and grow more costly, and overall mission performance will suffer.

APM helps agencies overcome these challenges by providing program executives and their IT teams with far greater levels of visibility and insight into how their applications are performing. APM tracks and analyzes the performance of all applications and transactions, helping agencies quickly uncover and fix problems with both their applications and infrastructure. With APM, agencies can move more confidently to public and private clouds, shared services, and other new environments. And they can deliver on the vision of a digital government that supports a vast array of users with optimized, mission-focused applications and services, anytime, anywhere, and on any device.

## About AppDynamics

AppDynamics is a recognized leader in APM, with a solid customer base across all three segments of government: Defense, civilian and intelligence. The AppDynamics Application Intelligence Platform is a comprehensive solution enabling government organizations to maximize application and mission performance. The platform is designed and architected to give users the confidence that their organization is running at its best, to give IT teams the operational visibility and control they need, and to give end users the great experiences they've come to expect and demand. The Application Intelligence Platform also is integrated so as to provide monitoring data on all aspects of the application infrastructure, including the end users (native mobile apps and browsers), databases, and servers.

Independent research firm Gartner rated AppDynamics as No. 1 in "Completeness of Vision" in Gartner's 2014 Magic Quadrant for APM. Of 12 APM companies evaluated by Gartner, AppDynamics was one of only three given the top rating as an industry leader. Gartner noted that the AppDynamics platform is "easy to deploy and expand" and "AppDynamics products are identical when deployed on-premises or SaaS, providing usability continuity. There is strong adoption for both models."

AppDynamics is also rated high in customer satisfaction. The company has a Net Promoter Score of 87, significantly higher than the software industry average of 17. The Net Promoter metric has become the industry standard for measuring customer loyalty, and AppDynamics' score far exceeds even those of customer-centric companies like Apple and Amazon.

Among its differentiating capabilities, AppDynamics offers:

- Ease of deployment, whether on-premises, in the cloud, or in a hybrid environment
- Deep and wide visibility into all transactions
- Low overhead — less than 2 percent — in terms of storage and processing demands
- Real-time analysis and management
- Scalability to highly complex, distributed production environments
- Baseline behaviors and assessing performance against those baselines
- Presenting an integrated view of real-time user experience, application performance and infrastructure capacity

For more information about AppDynamics and its products, call 1-415-442-8400 or email [info@appdynamics.com](mailto:info@appdynamics.com).

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