AppDynamics: Optimizing IT Performance For Federal Mission Success

Federal agency operations today consist of digital interactions between employees, citizens, constituents, and machines on countless smartphones, tablets, laptops, desktops, and back-end systems. This frenzy of digital activity, enabled by software applications, is essential to mission success and operational effectiveness. As a result, the stakes are high for agencies when it comes to monitoring and optimizing the performance of the many applications they rely upon for success. This is where AppDynamics, now FedRAMP Moderate ATO, comes in.

What we do

AppDynamics enables federal agencies to understand and optimize the connections between application performance, user experience, and mission outcomes. In short, AppDynamics provides mission-focused analytics on critical applications. These data-derived insights enable federal organizations to:

- **See the entire application in real-time** as it responds to individual end users and operates across the IT infrastructure. Using advanced machine learning and artificial intelligence, AppDynamics learns the performance of an application day-over-day, week-over-week, month-over-month, and establishes a dynamic baseline of its performance. When the application deviates from this baseline, AppDynamics alerts IT staff so they may spot and resolve potential performance problems long before they prompt end-user complaints or adversely impact the mission. AppDynamics' deep visibility into every end user's experience with an application allows agencies to understand how variables, such as a user's location, browser version, or device type, might relate to an application performance problem that could affect mission outcomes.

- **Act quickly to identify and fix the root causes** of potential problems and fine-tune an application — whether in development, test, or production — based on how the app is relating with its surrounding infrastructure.

- **Know critical trends** in the application over time and, importantly, how that application is contributing to agency mission goals in specific terms and in real time.

- **Provide business intelligence** to help agencies understand exactly how application performance contributes to or detracts from program and mission outcomes. Business IQ (BiQ) feature provides code-level visibility into application-based operations.

Our dashboard explains exactly how, when, and on which devices an application is being used; whether it is running as expected or abnormally; precisely how the application is interacting with the IT infrastructure supporting it; and how the application code or the IT infrastructure can be adjusted so the application can perform better and more reliably.

How we do it

AppDynamics does this by monitoring every line of code, seeing every user and every transaction across the IT stack, scaling as needed, identifying in real time any anomalous activity, and then presenting that information in highly consumable graphical presentations on a single unified platform, using one user interface.

AppDynamics adopts a top-down approach to performance monitoring by focusing on the end user's experience in conducting a transaction on an application. Our platform traces the entire transaction path — from the end-user device or browser through the application code, databases, third-party API calls, servers and other infrastructure nodes — to aggregate the response times and effectiveness of all required software functions and components needed to deliver an application response to a device or user-initiated request. This presents a far more accurate way of understanding the health of an application than traditional bottom-up approaches that rely on silo-based monitoring solutions.

AppDynamics can be deployed on premises, in a private cloud, or consumed as a service. As of June 2020, AppDynamics has achieved FedRAMP Moderate ATO status.

Primary federal use cases

AppDynamics is *used by more than 70 federal civilian, defense, and intelligence organizations* to support a wide variety of use cases. The most common for federal clients are cloud migration, application modernization, DevOps, and business Intelligence.

Cloud migration

When transitioning to the cloud, agencies must ensure their applications are optimized to leverage the power, scalability, and efficiencies that modern cloud architectures offer. AppDynamics is specifically designed to manage applications in these complex and dynamic environments. Our platform can monitor several thousand cloud nodes to keep pace with even the most extreme production environments, and it presents the performance and flow data in an easy-to-grasp, integrated way. And because cloud instances change frequently, the AppDynamics platform readily adapts to those changes, even as new nodes are provisioned and old ones are killed off. The AppDynamics platform continuously learns "normal" performance levels and automatically manages the clean-up of dead nodes.

AppDynamics helps agencies minimize the risks associated with cloud migrations by providing in-depth performance baselines of applications before and after a migration (see Figure 1) to ensure application availability and performance service level agreements (SLAs) are honored and that any performance gaps are quickly identified and rectified.
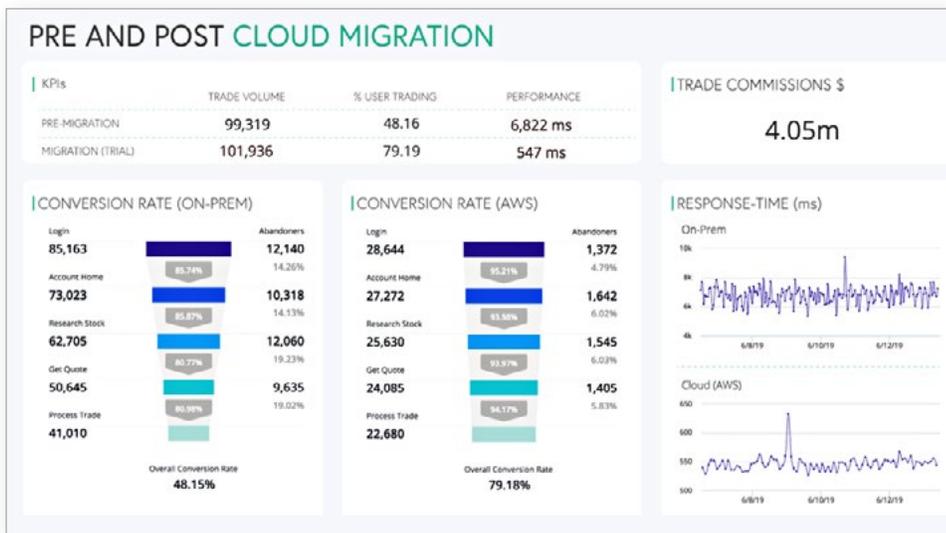

Figure 1:

AppDynamics screenshot showing the performance of an application pre- and post-cloud migration.

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Application modernization

Federal IT managers need to modernize their applications, but many fear that doing so will introduce performance problems. When adding new features to an app or deploying it to a new data center or cloud-based infrastructure, AppDynamics helps agencies address those risks head-on by providing IT staff with unprecedented visibility into an app's performance and dependencies in real-time (see Figure 2). Our platform enables IT teams to find and fix weak points in the code and databases to quickly pinpoint root causes of problems as they arise so that modernized applications meet or exceed legacy application performance.

A powerful capability, called Compare Releases, enables an IT team to compare the performance of an application before, during and after it is modernized. This removes much time, guesswork, and wasteful troubleshooting that typically occurs when relying on log files.
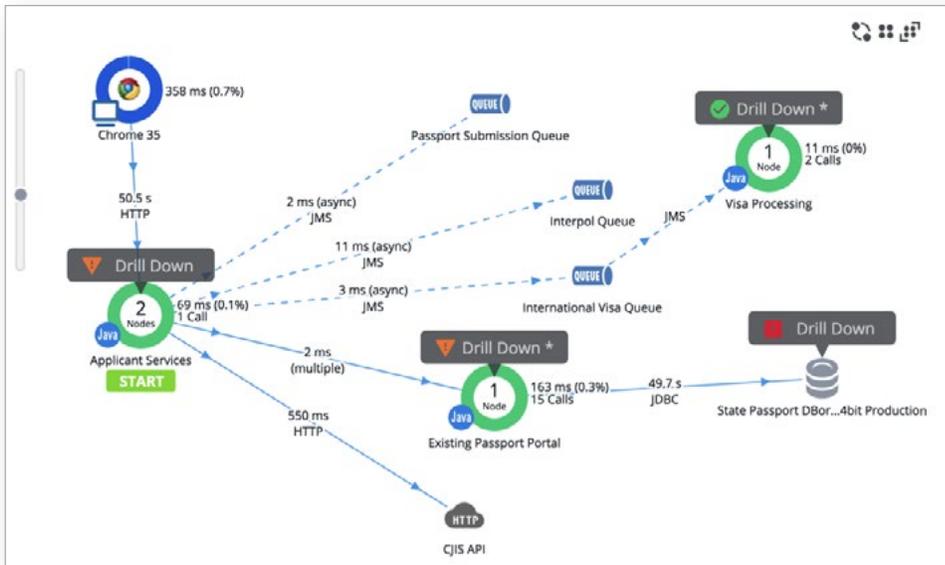

Figure 2:

AppDynamics screenshot showing where time is spent during a transaction invocation, an insight that assists with application modernization.

DevOps

There are numerous reasons why a new custom app may underperform. Developers need to know early in development if their code contains inefficiencies or poor design so it does not get all the way to production where it can take days to diagnose and fix. AppDynamics delivers code-level visibility so development teams can quickly track down the source of slowdowns and errors and detect hot spots (see Figure 3).
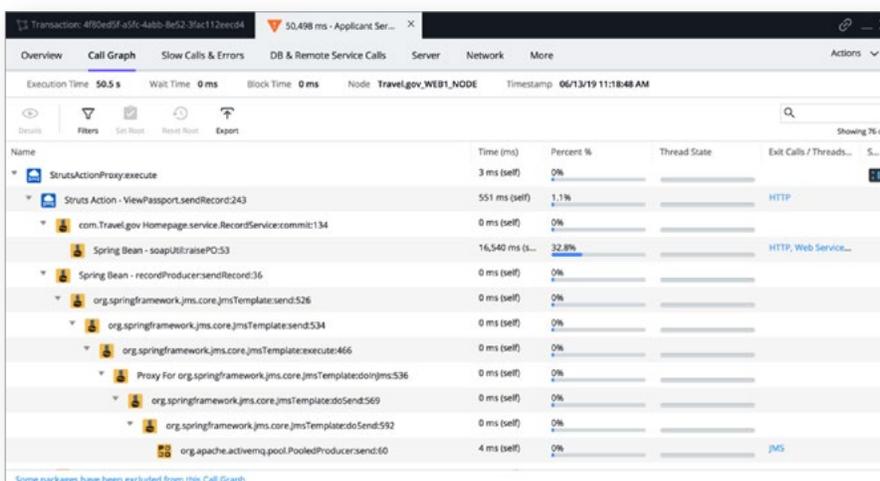

Figure 3:

AppDynamics screenshot showing code execution during a transaction invocation. Such insights enable DevOps teams to quickly identify poor-performing code.

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AppDynamics provides robust visibility into an application's performance, whether it runs on Java, .NET, PHP, Node.js, or C++. It includes many features designed specifically to help developers fine-tune their code, spot existing or potential problems, and, when problems do surface, quickly pinpoint the responsible statements or calls. One of those features, Development Mode, helps spot and fix performance issues while applications are still in development by relaxing the limits on data collection — such as call graphs and SQL statements — so development teams can collect detailed snapshots of every business transaction conducted by an application.

Business intelligence

It is increasingly critical that both IT and program managers understand exactly how application performance contributes to or detracts from program and mission outcomes. AppDynamics natively brings application performance data and program and mission data together in a meaningful way. Our Business IQ (BiQ) feature correlates application analytics to program outcomes in real time and provides a single source of truth for both IT and program teams so they can easily collaborate to optimize program results through increased application performance (see Figure 4).

BiQ provides code-level visibility into an agency's application-based operations. We call this the "business journey," and it includes all the many distributed events and back-end processes required to execute a business or operations process. Examples of a business journey might include a loan approval, a benefits eligibility determination, the intake and processing of a grant application, the onboarding of a new employee, a cargo inspection, fleet maintenance scheduling, or a visa application. BiQ sees how individual events and processes are performing, understands normal baseline activity, flags anomalies in performance or behavior, and quickly spots bottlenecks or friction points that can be further optimized for improved program or mission outcomes.
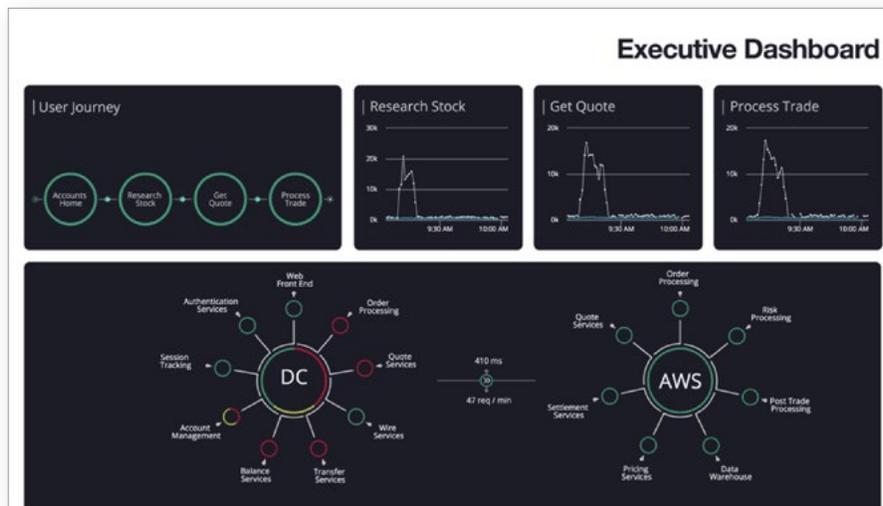

Figure 4:

Executive Dashboard showing the performance and health of all applications. Business Intelligence metrics are displayed next to Application Performance metrics.

Learn more about how AppDynamics is helping federal agencies improve their applications' performance and the mission outcomes they support at appdynamics.com/government.

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