

CLOUD FOR MISSION PERFORMANCE

Measuring and managing digital experience for better results

Improving mission readiness and execution – goals agencies are under pressure to meet – requires greater operational agility, more effective communication and collaboration, and higher-level predictive and analytic capabilities. These capabilities provide agencies the means to triage, mitigate and predict threats in real time – and to quickly find and fix mission-critical issues.

Agencies have taken steps toward reaching these goals, such as the Office of the Secretary of Defense DevSecOps initiative, but continuously improving is a never ending journey not a single stagnant destination. The transparency, culture, coordination, and speed required in today's IT environment demands digital, automated, real-time processes. Getting there requires a decisive and aggressive move to a multi-cloud architecture.

With cloud as a base, agencies can rapidly deploy advanced technologies such as automation, artificial intelligence and machine learning to improve decision-making, compliance, agility and productivity.

Monitor what matters for mission success

To get the most from cloud infrastructure and applications, it's important to understand user interaction and to have a method of measuring performance, speed,

throughput, latency and other variables. Being able to measure and quantify how cloud applications are being consumed and whether they are benefiting the organization is key. One example would be measuring employee time to complete digital transactions to see what the employee experience was and the labor cost impact.

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applications, such as Office 365, can also be unpredictable due to various complexities in federal agencies. According to one recent study, only 18 percent of Office 365 issues are actually found by IT staff. More than 60 percent are first reported by end users or other sources, such as vendors or social media. When issues are found, diagnosing and resolving a single issue in an Office 365 environment typically involves an average of six IT staff members.

Such issues could be handled faster and more effectively with Digital

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Applegate, chief technology officer at Swish Data, a service-disabled, veteran-owned, small-business service and solution provider. "Typically, that's because they weren't monitoring end-to-end application dependencies, so they didn't understand their baseline and the impact of a migration. When they moved the database, users began to complain and the mission was directly impacted."

Migrations from on-prem to SaaS

Experience Management (DEM) solutions, which can measure Service Level Agreements (SLA) in ways that matter to agencies – even if they don't operate the application themselves. DEM solutions allow agencies to understand normal response times for activities performed by the workforce, track activity volume, identify productivity loss due to poor application performance, and quantify the loss in financial terms – by department, location, end user or

other criteria.

“In the cloud, the performance KPIs that matter to you might include application availability network congestion or container efficiency,” Applegate said. “It’s a team effort to make sure that the application, cloud and infrastructure owners collaborate together and understand utilization, latency and time constraints. Having integrated performance dashboards

and analytics are critical for making collaboration second nature.”

To measure effectively, Applegate recommends using a DEM solution, such as Riverbed SteelCentral, a suite of products that enable you to monitor the digital experience end-to-end which, in turn, enables you to resolve issues faster across various teams. One product in this suite, Aternity, is an end-user experience monitoring

tool. The software-based solution is installed as an agent on any endpoint – desktop, smartphone or tablet – and can monitor anything on a user’s device, including the applications, the operating system and hardware. An agency applying metrics can determine how long a user spends completing business transactions. Identifying waste makes it possible to redesign employee experience or systems and

Overcoming Obstacles to Cloud Migration

Operating mission-critical applications in the cloud can be daunting. Here is a four-step process to help you succeed.

Plan

First, understand users and applications as completely as possible. Engage all stakeholders, from operations and network managers to line-of-business owners, the CIO and the cloud development team. Prioritize and map the applications that will migrate to mission objectives.

Next, model costs and compare providers up front, preferably using automated tools. Understanding costs will help you select the best cloud provider for your situation and whether it makes more sense to use a pay-as-you-go model or invest in reserved resources for a specific period of time. Next, model performance using a transaction analyzer, which can help determine performance bottlenecks so you can proactively address them as part of your plan. Finally, define metrics to be tracked by each team involved. This should include the application, cloud, infrastructure, network and desktop teams since all are impacted. At a minimum, these should include utilization, saturation

and error metrics. Remember the acronym ‘USE’ to easily recall these performance categories.

Migrate

Using the transaction analyzer, plan and model the migration. The right tool will enable modeling and testing to determine how migrated assets will perform in the new environment. Modeling will identify changes that are likely to occur before taking action, including bottlenecks and capacity issues, making it possible to preemptively circumvent challenges. Upon undertaking the actual migration, tools make it possible to track adoption by location and to monitor impact and progress. This allows for creation of new dashboards, metrics or processes based on the migration’s progress in real time.

Manage

Teamwork and collaboration are the key to managing applications and infrastructure in the cloud. One of the best ways to do that is through use of an end-to-end application map that allows decision-makers from all

areas of an organization to see what’s happening and where challenges are occurring. A solution like Riverbed SteelCentral allows stakeholders to see user activities, application performance, network segments and individual cloud components, either as a comprehensive view or by specific roles. An end-to-end application map can significantly increase the efficiency of troubleshooting.

Improve

Over time, it might become clear that some of cloud-hosted applications function better as a service or that an application could be refactored to improve performance. For example, an application team could develop and size an application based on one set of factors while neglecting to consider how much farther away it is from users or failing to take into account the security controls that operate between the cloud and end users. Optimizing cloud-based applications requires understanding the environment, limitations, and users.

improve productivity.

End-user experience monitoring of applications can benefit agencies in many different ways and help decision-makers in a variety of roles, from executives and line-of-business leaders to DevSecOps, Agile developers and the service desk.

For CIOs, executive directors and division chiefs, it is important to understand how organizations are running and whether they are achieving goals and objectives. With

an end-user experience monitoring tool, executives can understand normal response times, activity volume and productivity – and determine when these actions fall outside the norm. Advanced tools like Aternity use machine learning to learn baselines automatically so it is easy to find poor user experiences. If a defined metric is identified as deviating from the normal, it can create a problem or incident and combine it with a ServiceNow or Remedy ticketing

system for a closed-loop process. This type of closed-loop process helps resolve incidents before they have a large impact on productivity or cost.

Line-of-business or enterprise services groups, responsible for an application or function, also benefit from end-user experience monitoring. These groups have an interest in understanding how an application or function is running and answering critical questions: What are the transactions? Is it working poorly at

State Department Moves Decisively Toward Multi-Cloud

About five years ago, the State Department survived a security breach that threatened to expose its “crown jewels” – human resources, passport and financial data. After that breach, department leaders threatened to shut down Internet access completely. Realizing that wasn’t realistic, it began to explore moving to the cloud. The first foray was around 2015, when it created an initial cloud environment using AWS and Google G-Suite.

It only mushroomed from there. The goal was development of a multi-cloud ecosystem that would enable collaboration, communication and space to innovate – while also meeting global business requirements in a cost-effective, operationally efficient and secure environment. In a way, the department didn’t have much choice. Different parts of the organization had already started on cloud implementations.

“Since we have embassies around the world, the cloud will enable our mobile diplomats to work

from everywhere and anywhere,” said Alen Kirkorian, division chief, Innovative Strategy and Security, Office of the Chief Architect. “It also will allow us to not only collaborate with people internally, but with our government partners, foreign governments and educational institutions.”

Today, the department is on the road to a full multi-cloud environment, complete with a Cloud Program Management Office (PMO) that manages more than 200 cloud assets, 42 cloud service providers, 25 bureaus, 36 social media providers, 100,000 users of Office 365 and 37 active Authorities to Operate (ATO).

“The Cloud PMO manages the architecture, planning and delivery of a secure multi-cloud ecosystem for the department. It was critical in managing the multiple, uncoordinated cloud initiatives underway at the department, which were making it difficult to track, monitor and secure the cloud presence,” Kirkorian said.

Now that the multi-cloud environment is essentially complete, the department can implement and manage everything from ATOs to sourcing, governance, SLAs, compliance and single sign-on, along with new capabilities and technologies it plans to introduce.

It is already changing the way the department does business. For example, managing document revisions via email often results in multiple versions, while cloud-based applications like Office 365 and Google G-Suite enable more coordinated collaboration. “The State Department also plans to use the cloud to enhance customer engagement activities,” Kirkorian added.

“We want to be able to partner with customers in a way where we can really focus on the business they need to accomplish, rather than the technologies we think they need,” he explained. “It will enable us to get true feedback and help make sure that we push forward.”

some sites or departments and less well in others? An end-user experience monitoring solution can enable IT operations, for example, to isolate an application problem to a user's device, network or server; analyze response time between the device network infrastructure and server, understand how traffic volume affects performance, and isolate the delay to a specific server or network. It also helps application owners discover every local, cloud and mobile application to verify license usage and quickly view an application's performance to assess the impact on enterprise-wide productivity.

Software developers can use end-user experience monitoring to more quickly develop applications and functionality – and roll out changes while measuring the impact of those changes. Developers can choose a period of time when a change took place and measure the impact before and after the change was made.

Service and help desks, which often struggle with capacity and constraint problems, can also benefit. With a cloud monitoring tool, these functions can immediately identify how much time is spent on the network, on the client and on the server. It can identify all of the applications a user is running on a device, identify every business activity performed and track response times against the baseline as seen by the user. With that information, service desks can determine capacity or constraint problems, not only at the device level, but for individual locations, users and applications. They can also integrate end-user experience monitoring with other tools, such as security information and event management (SIEM) or service desk solutions.

Maximizing mission attainment

With effective cloud infrastructure and monitoring capabilities in place, agencies can get to the real payoff of maximizing the mission.

For one Defense agency that relied on a mission-critical application hosted by another agency, gaining end-user insights with an end-user monitoring solution made all the difference. After deploying Aternity, the agency was able to measure and report on users' experience based on time spent on the client, network and server. As a result, they could transparently triage issues and solve them collaboratively with the shared service provider. This led to a significant reduction of trouble tickets, a faster mean-time-to-restore (MTTR) and an increase in SLA compliance.

That's only one of many potential ways to use end-user experience monitoring tools to maximize mission attainment. Using technology to advance mission attainment depends on mission specifics. For agencies focused on employees working remotely on mobile devices, the emphasis may be improving productivity by reducing bottlenecks and downtime. For organizations in the healthcare world, it may be understanding adoption of new medical applications and rapid optimization of processing times at remote clinics.

“Understanding your priorities and the components involved allows you to prioritize where you can make the smartest investment to improve performance the most,” Applegate said. “Then look for your biggest constraints – the things that cause the biggest problems. If you can eliminate those

constraints, you'll typically maximize your mission velocity.”

Finding those key constraints can be tricky. In a large environment, they often involve latency or congestion. This could be due to any number of factors. One key to determining constraints is knowing the path applications travel and how long it takes to reach users' devices.

Having identified key constraints, the next step is to optimize them. Aside from rewriting an application or taking steps to optimize code, IT administrators can cache content at the first mile with a content delivery network (CDN); apply quality of service and path with SD-WAN across the last-mile; and optimize protocols and applications with WAN optimizations to address WAN latency and bandwidth constraints. Tightly integrating these end-to-end optimizations into an overarching performance strategy allows organizations to build high-performance mission systems with predictable global user experiences.

In one case, a Defense agency was dealing with frustrated users constantly complaining of a poor experience impacting mission velocity. Basically, they were waiting up to five minutes for single web pages with time-sensitive operational data to display. With SharePoint servers overseas and a large staff in the United States, the agency deployed two Riverbed SteelHead WAN optimizers, which immediately increased the speed of the application by a factor of more than ten times. A transaction that had required up to five minutes to complete was shortened to 10 to 15 seconds, which accelerated mission velocity and improved employee experience.