Getting to Know All About You: Visualizing and Monitoring Application Performance for Digital Transformation

The application is king, and it's time agencies became familiar with His Majesty.

From internal communications solutions to citizen-facing portals, applications move the muscles of government services. They empower and they frustrate, but they undeniably rest at the helm of networks.

The forces giving rise to an app-potent digital culture are twofold: first, a change in the way applications themselves are developed. Whereas a tightly chronological, waterfall process used to govern development, programmers today work in agile environments using principles like DevOps that allow them to have refresh cycles more and more frequently. With updates entering the mix rapidly, an application's entire makeup could change at the drop of a hat.

The second phenomenon pushing applications center-stage is the abundance of services available to developers, like GPS integration, that can appear in a final product. There's a slew of capabilities available from third parties that often make perfect sense to integrate into a software, but writing in softwares from other networks increases application complexity even further.

This is all according to Davis Johnson, Vice President and Head of U.S. Public Sector at Riverbed. In a recent viewcast with *Government Executive*, two federal technology leaders, one current and one retired, and Johnson, an expert from the private sector, weighed in on the challenges and opportunities surrounding the vital tasks of application visualization and management.

The big idea: applications are confusing, time-consuming and often difficult for leaders in government to wrap their heads around.

"People need to start paying attention to the application," Johnson said. "Networking is becoming ubiquitous, and the data center of choice, more and more, is becoming the cloud."

Getting to know your network

When former Department of Transportation (DOT) CIO Richard McKinney saw the need for digital transformation in his agency, he identified a unique but surmountable obstacle in DOT's federated system. The network is made up of a number of field offices in addition to the federal office, which functions as a sort of hub for the others. Moreover, no one that McKinney asked at DOT seemed capable of visualizing the connections among all the systems. The agency's network behaved less like a fluid entity than a compilation of sorts — network Frankenstein.

"That made me uncomfortable from the day I walked in," McKinney said.

Yet he prioritized visualizing the network, well-aware that doing so could be a doozy. Using Riverbed solutions, McKinney first was able to identify major issues across a network of what he believed to be about 800 devices. After using Riverbed's automatic discovery capability, he learned the network in fact had 1,000 devices on it at the time, 200 of which were patchwork, ad hoc solutions enacted by field offices that weren't being directly managed by the federal office and were thus uncounted.

"Once we finally saw what our network looked like, Riverbed helped us manage it and figure out where we needed to strengthen as we moved to the cloud, etc.," McKinney said.

Doing so set the stage for a much greater cloud migration over the coming years, McKinney said. But network visibility proved fundamental, like the bedrock of a house. Just as a weak foundation can cause damage and even destruction to a building over time, so too can an inaccurate understanding of network structure lead to poor management and ultimately unsuccessful transformation.

Because DOT was able to manage the capacity of its network, it was able to move forward confident about the strength of its applications — what McKinney calls a "fundamental improvement in the way we do business."

Getting to know your applications

To hear the full conversation, view the Riverbed viewcast here.

Before developing a big-picture understanding of your organization's application performance, you'll need to take an accurate temperature of the status quo. Applications across a network may all run at different capacities, and it's imperative to a successful modernization effort that leaders kick things off with an understanding of their applications' baseline performance, Johnson said.

Often times, he said, this problem manifests in the form of an employee making a call for support and reporting that applications aren't "normal," yet unable to elaborate on what "normal" is in the first place.

"A lot of people haven't bothered to take a baseline before they endeavor to do these big transformation projects," Johnson said.

The idea of a baseline has implications across the enterprise that include cloud migration as well as security. Agencies should leverage solutions that both help them discern an application's baseline and also keep tabs on its performance over its lifetime.

"[You need to] have tools in place to meter the application, so when something goes wrong, you can immediately tell what's wrong and dig into it quickly," Johnson said.

After understanding that baseline, modernizing becomes a matter of selecting which apps are ripe for the picking and which need more careful consideration (and practice) before they're ready to migrate to the cloud.

The Federal Communications Commission has made significant headway by employing change agents who, according to Deputy Chief Information Officer of Technology and Resiliency Christine Calvosa, helped them wrap their arms around both legacy applications in need of modernization as well as any other apps deemed "cloud-ready."

You don't have to start with the most critical applications. In fact, you shouldn't. When migrating to the cloud — especially when you're just getting your feet wet — it's best to pick simple, low-risk applications that have room to fail.

Shortly before Calvosa joined the FCC, the agency modernized and spun up its Consumer Help Center into the cloud using a software-as-a-service provider. From the FCC's perspective, Calvosa said, starting where the team knew there was room for exploration made a staggering difference.

"A lot of people get stuck wondering where to start," she explained. But there's no sense in that. "Just go to your boss and say, 'I think we have three applications we can move to the cloud. And just go for it."

Getting to know your users

Perhaps most importantly, agencies should keep a close eye on the attitudes and experiences of their end users, the employees and consumers that use their applications from the front end on a daily basis.

Current best practices in user experience dictate that the onus is on government for making services accessible, digestible and pleasant for citizens. That may sound like a tall order, but Johnson believes it's both pragmatic and completely possible for government to meet the bar the commercial sector has set.

"It should be easy to go to an application to make a reservation to get your license renewed as it is to go to OpenTable to make a reservation at a restaurant down the street," he said.

And just as important as knowing users' expectations is knowing what they're experiencing as they interact with your applications in real time.

Both Calvosa and McKinney offered the advice that end-user experience monitoring can work in federal agencies. Johnson corroborated their claim.

"It's easy to implement, it's very affordable, and it's very lightweight," he said. "It doesn't affect performance and gives you unbelievable information about how long things take and, when

changes occur, the people responsible for ensuring applications perform will typically be notified before the user even notices."

In the world of visualized networks and well-monitored applications, government has ample opportunity to craft a citizen experience with virtually no friction.

Moving forward

As agencies continue to take their networks through digitally transformative modernization processes, they'll need to maintain focus on applications. Starting small and starting now are imperative. For Calvosa, the future of the federal networks is cloud-based and software-defined. McKinney agreed, and both emphasized the importance of studying the end user.

"In the near future, we'll have networks that manage themselves, provision themselves, and there will be a whole lot less human management," McKinney said. "It's one of those things that we have trouble even wrapping our heads around."

Johnson, representing the private sector's vision, sees today's technology as capable of empowering the networks of the future to be free of human meddling: autonomous, self-healing and always high-performing—whether we can "wrap our heads around" them or not.