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DIGITAL DIALOGUE

Highlights from a recent webcast series on cloud computing

NEW WAYS TO MAXIMIZE CLOUD COMPUTING

It takes trial and error to manage performance in the cloud, successfully migrate to it and deliver apps to increasingly mobile users, experts say. They share some lessons learned.

Government agencies continue to test the pros and cons of cloud computing, especially as mandates and standards for using it keep trickling down from the Office of Management and Budget and the National Institute of Standards and Technology. NASA's Goddard Space Flight Center has been using and evolving cloud computing since 2009, tweaking performance as it goes. Adrian Gardner, director of the Information Technology and Communications Directorate and chief information officer at Goddard, found that the best approach for his agency is one that is still developing, he said during a June 12 webcast titled "Managing Performance in the Cloud."

"If you look at our environment, we have everything from desktops all the way to supercomputing," Gardner said. "The question was where does cloud fit into that. It wasn't really an either/or discussion. It was really, 'How do we add cloud into the computing architecture that we have in place?'"

Gardner and his team determined that cloud fit between hardened data centers and supercomputing. To best meet customers' needs, they turned to data storage, a cloud storefront and a cloud broker. A cloud broker is defined as a third-party intermediary between purchasers and sellers of cloud services. Cloud brokers help by simplifying administration, such as researching services, negotiating contracts and transitioning from one cloud service provider to another, Garnder said.

Goddard's cloud service delivery strategy was borne of OMB's Cloud First policy, set in 2011. To that end, Gardner said, he started with training.

"I don't see cloud as a technology. To me, it's really a business transformation and so one of the important things is educating the IT team," he said.

Next he looked for migration opportunities in the IT maintenance schedule -- old or existing applications that need replacing or upgrading – and reached out to the agency's business and mission sectors to see how cloud could help them. He also established a team to monitor developments in the cloud industry that could be applied at Goddard.

Gardner's goals for managing performance in the cloud include agility, security, a prepared workforce, metrics and ways to manage data. He defined agility in several contexts: the ability of the enterprise to respond quickly to unforeseen changes in business demands, switch vendors quickly if things go awry or contracts end, reach platform agility through server virtualization, and achieve network agility to let Goddard control and monitor traffic.

To determine whether cloud performance, management and security were working properly – and to find out the

GOALS FOR PERFORMANCE MANAGEMENT

At NASA's Goddard Space Flight Center, Adrian Gardner, director of its Information Technology and Communications Directorate and its chief information officer, set the following objectives for managing cloud performance:

- Agility
- Security
- A prepared workforce
- Metrics
- Data management methods

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return on investment -- Gardner set metrics to check how cloud reduced delays and risks, optimized total cost of ownership, scaled resources, and generally improved IT services.

"Shifting to a cloud model enables organizations to recover and reallocate resources on-the-fly and ship workloads from one environment to another," Gardner said. "As we look at the declining budgets that the federal government has and will have in the near future, I truly believe that cloud computing is one of the solutions that will yield benefits and return on investment and allow us to agilely provide users what they need, when they need it and in a timely way."

Akamai's role in cloud performance

In recent years, customers have come to see Akamai Technologies as a cloud optimization and security player, said Tom Ruff, vice president of the company's public-sector business.

Akamai can turn services off or on within hours and provides pay-as-you-go pricing and scalability. What's more, the company puts security first, Ruff said. Akamai products are Federal Information Security Management Act moderate and Defense Department Type accredited for the Secret and Non-classified IP router networks, for example.

User experience and adoption are also important, Ruff said. To encourage those, Akamai provides a portal that lets users monitor the cloud experience. Metrics help, too. The average government customer realizes more than 85 percent network and web infrastructure offload using Akamai cloud services, he said

"The ability to be able to do offloads, to be able to drive performance change and reduce costs seems to be a win-win-win for the government," Ruff said.

Cloud takes hold at DHS

At the Homeland Security Department, cloud use has also seen a steep and steady increase, especially in the past two years, said Keith Trippie, executive director of the Office of the CIO at DHS' Enterprise System Development Office, during a July 23 webcast titled "Ensuring a Successful Migration to the Cloud."

"A few years ago, hybrid and community clouds were very nascent, so we had a very, very simple strategy: If our data is sensitive, we're going to put it in our private cloud; if the data is not sensitive, we're going to put it out in the public cloud," Trippie said.

Today, the DHS public cloud involves data in transit such as government-to-citizen services like DHS.gov, FEMA.gov and TSA.gov, he said. "All of those a little over a year ago were still in the old, traditional, physically based environment," Trippie said. "In the past year, we have now got 10 different public services or websites that are up, all open source and out in our public environment."

More websites are moving to the new environment soon, he added, and DHS is working to enable a mobile workforce by implementing a virtual desktop and supporting mobile device management.

"One of the issues that we had a few years ago was we didn't have an ability

TEN STEPS TO THE CLOUD

NASA has developed a 10-step strategy for moving services to the cloud:

1. Adopt a "Cloud First" policy for new projects.
2. Educate the IT team.
3. Move test and development to the public cloud.
4. Review your IT maintenance schedule.
5. Convene a cross-functional project planning team.
6. Hire an expert to spearhead the project.
7. Consider ongoing cloud support needs.
8. Build the migration and integration project plan.
9. Develop a cloud decision framework and measurements.
10. Migrate and integrate!

> "Innovation is neat and technology is great, but mission objectives are the real starting point"
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> *— Keith Trippie, executive director of the Office of the Chief Information Officer at the Homeland Security Department's Enterprise System Development Office*

for seamless interoperability," Trippie said. "We were interoperable, but not in a way that was maximizing our ability to do information sharing. So what we established with authentication-as-a-service is the ability to reduce and do single sign-on across multiple applications across the department. To date, that's well over 100. A few years ago, there was maybe five to six."

Mission objectives are the heart of DHS' push toward the cloud, Trippie said. "Innovation is neat and technology is great, but mission objectives are the real starting point and how we support them is crucial," he said.

Money matters also play a role. Cloud enables IT managers to provision a server in 15 minutes as opposed to 12 months, Trippie said, but if it takes up to eight months to obligate money on the contract before the IT team can start the provisioning process, there's a problem with acquisitions. To avoid that, he relies on drawdown accounts, which let him draw down against a set of funds as the money is obligated.

Trippie said the migrations have taught him a few things. First, standardizing on platforms and infrastructure frees capital for innovation. Second, industry practices, software licensing and employee cultures must change.

"There's a lot of change that has to happen to truly move to a commodity IT culture and a lot of that isn't in place today," he said. "Whether it's from how we finance our programs to how we have the right federal staff to oversee vendor and [service-level agreement] management, that's a maturing space."

Peace of mind during an emergency and reducing costs are other big benefits of cloud, said Akamai's Ruff.

"How do you move what you consider important assets out to a third-party hosting center and still feel comfortable that those applications will be protected as well as if not better than if they were hosted in their data center?" he said. "That's where standards and NIST and standards such as [the Federal Risk and Authorization Management Program, or FedRAMP] and FISMA come into play as well as some of the DOD credentials," which Akamai's solutions comply with.

"We have the ability of extending the enterprise infrastructure to the public Internet while at the same time reducing operational costs, improving end-user experience, and certainly improving the security posture – more of a defense-in-depth complement either to an origin or a cloud solution," he added.

Moving toward mobile

Mobile computing is one of the main things cloud enables, and its popularity continues to skyrocket, said Kathy Conrad, principal deputy associate administrator in the General Services Administration's Office of the Citizen Services and Innovative Technologies, during a Sept. 10 webcast titled "Mobile Government: Strategies for Delivering World-Class Apps."

"Mobile is changing the way we communicate. It's changing not just where and when and how we get and receive information, but it's totally changing how we live and work," Conrad said. "As a society, we

CLOUD ESSENTIAL ATTRIBUTES

The Homeland Security Department has identified five key capabilities of cloud services:

1. **Measured Service**
   * Computing resources are consumed as services
2. **Resource Pooling**
   Resources are shared among many customers
3. **On-Demand Self-Service**
   Customers pay based on usage, reducing capital expenditure burden
4. **Rapid Elasticity**
   Resources are provisioned or released in near real-time
5. **Ubiquitous Network Access**
   Role-based access and authentication

> "How do you enhance the user experience and how do you really take advantage of the features of mobile devices that aren't present in other technologies?"
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MOBILE AT WORK IN THE GOVERNMENT

- **The Transportation Security Administration's MyTSA** – This application lets flyers check for airport and security delays in real time. It also has a "What Can I Bring" feature that lists what's allowed on planes.
- **The National Park Service's National Mall App** – Through interactive maps, Mall visitors can get directions or the times of programs and ranger talks to create custom tours. Users can point their devices at a site as if taking a picture and the app will tell them where they are and what's nearby.
- **The Transportation Department's SaferCar** – Users can see safety ratings and recalls on car seat, and find places for help with installation.

want immediate access, immediate response and clear and easily used information…. People use mobile and desktops to accomplish many of the same things. There's a growing expectation that you should be able to do anything on a mobile device that you can do on a desktop."

The government is part of this mobile ecosystem, she said. USA.gov, for example has seen mobile visits jump to 3.4 million this year, up 50 percent from last year. White House-issued orders such as the 2012 Digital Government Strategy and the recent Open Data Policy, which requires agencies to open data to developers, businesses and citizens, are enabling mobile in the government.

"One of the hallmarks of the strategy was its focus on sharing resources and services across the government and delivering them in a safe and secure way," Conrad said. It wasn't just a plan but a framework with 29 milestones. Today, all the milestones have been met, with several expediting the use of mobile, she said.

Milestone 7.2, for instance, called for agencies to optimize at least two customer services for mobile use. Milestone 3.6 called for the creation of a Mobile Application Development Program. One result of the program is the Federal Apps Registry and Apps.USA.gov, a central library of all the government apps that are available for the public to use – 185 so far.

"To help agencies not just plan and promote their apps, we also have developed a code-sharing catalog to help agencies develop their apps," Conrad said. "As developers are looking to jump-start their efforts, they can turn to the code-sharing catalog to find source code for both native and web projects from a variety of sources."

Another milestone was the need for a governmentwide contract vehicle for procuring and delivering mobile devices and technology. The upshot is the Wireless Federal Strategic Sourcing Initiative, which consolidated the number and variety of wireless contracts, improved information management, and established a Center of Excellence.

"The government and our industry partners have worked together to make tremendous progress in how we're using mobile technology, how we're building the capability to use it even more effectively and more broadly and in ways that would not otherwise be possible," Conrad said.

"And that's really the key," she said. "It's not to take a website and make it available through a mobile device. It's really thinking how do you enhance the user experience and how do you really take advantage of the features of mobile devices that aren't present in other technologies to truly transform how services and information can be delivered to the public." •