

Highlights from a recent Webcast on Federal Cloud Computing.

# CLOUD COMPUTING EXTENDS THE ENTERPRISE

Federal agencies continue to embrace cloud computing, which helps them provide more innovative services.

**T**he General Services Administration (GSA) and Department of Homeland Security (DHS) are among the agencies embracing cloud computing to extend their enterprise and help foster innovative approaches to developing new IT services. The Cloud First policy released by the White House nearly five years ago, and programs such as Federal Risk and Authorization Management Program (FedRAMP), which provides a standard approach to cloud security,

have helped speed government cloud adoption, according to government and industry experts speaking during a Web series on cloud computing.

Moving to the cloud improves the performance, effectiveness and flexibility of an agency's enterprise. It helps provide data and services to users wherever they're located. It also gives agencies a platform to experiment and try new things that would otherwise be too risky or cost prohibitive. Cloud lets agencies innovate, which requires speed, agility, and room to fail, says

Navin Vembar, IT Director of the Integrated Award Environment at GSA.

"With the cloud, I am no more than four minutes away from a working machine that wasn't there before that's configured in a way that is useful to me," he says. "That is an exceptionally powerful thing and something that we in government forget or ignore."

One of the advantages of cloud is agencies can develop real applications, test them on a smaller scale and either expand them if successful or abandon them if

## LESSONS LEARNED

Considering moving to the cloud? There are numerous issues agencies must grapple with as they consider a move, including whether security and trust are sufficiently addressed. Greg Capella, acting Executive Director of the Enterprise Systems Development Office at the Office of the Chief Information Officer of DHS, offers these lessons learned:

- Cloud providers offer similar services, but offerings such as interfaces, APIs, CLINS, and supported services can be quite different.
- Services may not include aspects you have come to expect. Take time to understand what is offered by a vendor and what is not.
- Services change often and are based on the market. When you buy commodity services, you're buying what vendors provide.
- Double check your service level agreements and be ready in case you have to make changes.
- Start with a small project that requires commodity hardware and common operating systems that are relatively easy to migrate.
- Find a business lead to help you and work with you, bring in security and privacy from the get go, partnering is essential.
- Talk to other government agencies that have used the same vendor to get some lessons learned.

they're not. Cloud lets users get to a "successful failure" for less money and in a faster timeframe than sketching something on paper. "The paper solution will never tell you nearly as much as a prototype in a real environment," says Vembar. "And that's where cloud really can shine."

Agencies will have an easier time getting to a solution if they focus on the agency mission, view any decision within the governance and architecture framework of the agency, and tie the development and operations teams more closely together, says Vembar. The Dev/Op flow should ensure compatibility among different layers and offer continuous integration providing "space to fail."

When creating their test environment, agencies have to consider security as well, says Vembar. For example, an agency would require more security if an application is tested with a broader audience versus a smaller internal group. However, when using a Dev/Ops flow, similarities within components of an agency's test environment can be set up to satisfy security requirements.

Cloud innovation represents a cultural change, requiring agencies to rethink how they view risk. "[New technologies] are not as risky as it used to be," he says. "That is something that is hard to get your head around."

Governance for the cloud is also different than traditional IT governance. "None of this is easy or free or trivial," says Vembar. "Innovation is scary. To do this there has to be a certain amount of boldness."

## AN ARCHITECTURE THAT COULD SAVE TRILLIONS

Do you want to help the government save a trillion dollars, or more? One government expert, Patrick Stingley, an IT Specialist at the Department of Interior, who co-authored the term "cloud computing," has a solution that could do just that.

He has crafted an end-to-end enterprise architecture from the desktop to the cloud that provides the best possible solution for the least amount of money, he says. The architecture focuses on optimizing the four "prongs" of the enterprise: data centers, applications, telecommunications and desktops. It relies on solar power arrays for power.

Get rid of today's servers and large data centers, he says. A typical server costs about \$8,000 and uses half a kilowatt per hour to run. Agencies should use commercially available single board computers. These are also used in military Humvees that run at 5 volts, can operate in extreme weather conditions, and have a 6-hour battery backup. The government can save on power consumption and the need

for large data centers.

Cost savings can also come from using virtual private networks. These make rewriting applications faster and cheaper. Rely on the cloud to store primary transactional data, instead of tiers of internal storage.

Stingley also suggested using a redundant path to the cloud with a cellular-based router. "It doesn't matter if you have the best cloud ... if you can't get to the cloud, it won't work," he says. On one side, agencies can use a cellular data plan—and Wi-Fi on the other. The Internet would be used as a wide-area network, as opposed to procuring new circuits. In addition, agencies could buy \$250 laptops to replace \$800 laptops, for a significant cost savings.

Overall, the cloud architecture reduces costs, improves service and lowers the government's carbon footprint because it runs on solar. Agencies can choose to do each of the four "prongs" independently, Stingley said, but recommends reducing the data center footprint first.

### DHS Commits To Cloud

When it comes to the cloud, it helps if agencies start small and share what they've learned with others, says Greg Capella, acting Executive Director of the Enterprise Systems Development Office at the Office of the Chief

Information Officer of DHS.

DHS is ramping up its commitment to the cloud because of the flexibility, cost savings, agility, and speed to market it offers, says Capella. "We anticipate continuing enterprise data centers, but we intend to get more and

more of our services from the cloud.”

Almost every DHS component plans to move mission-critical systems to the cloud. The United States Citizenship and Immigration Services is leading the way, says Capella. “Moving to the cloud is imperative today because of our budgets.” Also, the cloud helps the agency keep pace with accelerating threat and mission requirements and improves security.

To get the most out of cloud, agencies should employ open source software and agile development to reduce risks and costs, as well as Dev/Ops to automate the agile development and testing cycle, says Capella. There are many implications for an agency first migrating applications to the cloud, including whether it can maintain security parameters or the same level of trust. There are programs that can help, such as FedRAMP, and its anticipated support for the high baseline, Einstein 3A, and Managed Trusted Internet Protocol Service (MTIPS) with support for perimeter and network security.

Moving to the cloud won’t be easy, but it will be worth it. “It takes quite a bit of planning but we are embracing that,” says Capella. “There are not only financial but also technical advantages for doing so. So we expect to go forward.”

### Cloud: A Business Decision

For most agencies, moving to the cloud means justifying the investment and proving that it will save money over the long term. “For government agencies, cloud isn’t so much an IT decision, it’s a business decision,” says Alan Boissy, Product Manager of vCloud Government Service at VMware. “The most successful cloud deployments

are going to ... show you are spending money efficiently and ... show those cost savings after your migrations.”

Agencies are getting smarter about the workloads they want to move to the cloud, he says. “Those decisions are going to drive a lot of cloud strategies going forward because if they are able

to show early success and early cost savings, then it will make their cloud journey much easier.”

About 70 percent of agencies are expected to pursue the hybrid cloud, says Boissy, which minimizes the risk of moving to the cloud. In most cases, agencies will move to a multi-cloud

## HYBRID CLOUD BENEFITS

When it comes to developing and testing applications, agencies need security, scalability and federally compliant platforms. They need to be able to replicate and run that environment in a production environment.

Traditionally, this hasn’t been easy. There has been limited budget for Dev/Ops, inconsistent configuration across various stages of deployment, insufficient capacity and an inability to replicate test environments.

Developing and testing in the cloud makes this easier, says Stu Fleagle, Vice President of Government Solutions at Carpathia, A QTS Company. The benefit of using VMware vCloud® Government Service provided by Carpathia™ for testing and development is it lets agencies use the tools they already have.

### WHY TEST/DEV IN THE CLOUD?

Cloud gives you a working environment in minutes versus weeks

It removes budget and resource barriers to standing up an IT environment

It improves testing accuracy and efficiencies by making it more predictable and manageable

Cloud delivers a development environment that looks like a production environment

### TOP 6 BENEFITS OF AN ENTERPRISE CLASS HYBRID CLOUD

- Enjoy broad application and infrastructure support
- Go live much faster
- Extend your virtual network and get support from the partners you trust
- Stay confident about security and compliance
- Keep costs and risks low
- Easy to grow

scenario where some data has to stay in the data center, he says.

Looking at a hybrid solution across the government “makes sense because you ... can leverage the technologies in the cloud when and where they make sense,” says Stu Fleagle, Vice President of Government Solutions at Carpathia, a QTS Company.

VMware has selected Carpathia to design, build, and operate its federal hybrid cloud solution called VMware vCloud® Government Service provided by Carpathia™. The benefit of using vCloud Government Service is it uses the same VMware technology stack and management platform many agencies already use, says Fleagle. Through vMotion, agencies can move from a dedicated platform into a cloud environment or from a dedicated hosted environment connected within the same facility to a multi-tenant cloud.

Also, vCloud Government Service bundles services such as firewalls, load balancers, VPNs, and disk I/O at no extra cost. “[And] these services do not consume the resources you are paying for already. They come inherent in the solution,” says Fleagle.

vCloud Government Service makes it easy for agencies to develop or test an application or develop a prototype, because they can use the same tools they’re accustomed to using, says Boissy. It also lets agencies reuse investments they made in people, infrastructure and licenses.

“You can bring your own tools, extend your data center in the cloud, use the same monitoring tools you had ... you can use the same IP addressing

## CLOUD CHALLENGES, HYBRID SOLUTIONS

Agencies face certain challenges as they consider a move to the cloud, says Alan Boissy, Product Manager of vCloud Government Service at VMware. Some of these challenges include:

- Each cloud service provider has their own offering, so it’s difficult to make apples-to-apples comparisons.
- Existing agency applications and IT systems are difficult to lift and shift in the cloud and require re-engineering.
- Most public clouds are optimized for new applications, so agencies must learn new skill sets.
- Sometimes network integration of public clouds is different from how an agency data center is set up.
- The cost of certain applications or utilities agencies use such as anti-virus software or monitoring tools, are not always apparent in the beginning.

So what is the solution? VMware offers a hybrid cloud approach that addresses these concerns, Boissy says, because it maximizes and leverages investments in an agency’s infrastructure, people, licenses and software.

VMware vCloud Government Service provided by Carpathia delivers cloud services such as application catalogs, compute, storage, networking and security, and lets agencies reuse their existing investments. This saves them money. Agencies can bring their own tools, use the same IP addressing scheme to extend workloads into cloud, and bring their own licenses and existing VMs with no conversions required.

scheme to stretch your workloads into the cloud. You can also bring your own VMs that you built,” says Boissy. “And you’re able to reuse a lot of the licenses that you currently have.”

The cloud is useful as a development and testing environment because it lets agencies cut down on the procurement cycle and buy services on a utility basis, adds Boissy. Using vCloud Government Service as a development environment makes it easier. “You can feel confident what you are

running in production will run the same in the cloud.”



For more information on how vCloud Government Service can help your agency extend its enterprise please visit: [vmware.carpathia.com](http://vmware.carpathia.com).