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Cultivating a “Cloud-First” Culture

Enormous opportunities for greater agility, scalability, productivity and cost savings abound when you embrace a “Cloud-First” culture.

If you are NASA CTO Chris Kemp, your agency recently halted RFPs for an ID/IQ contract worth up to \$1.5 billion for outsourced Data Center services over multiple years.

That’s great, but NASA still needs the compute power the \$1.5 billion buys.

At the same time, NASA is reevaluating its enterprise strategy and cultivating a “Cloud-First” policy; one that Federal CIO Vivek Kundra calls necessary to fully achieve the economic gains of Cloud computing.

So what Kemp needs is a “secret sauce” to change the culture and convince NASA scientists and users to stop and consider: What type of computing experience would make me stop spending scarce resources on new hardware infrastructure?

“The ‘secret sauce’ was listening to our customers, the end users and scientists; then figuring out what computing experience would make them stop buying a bunch of hardware infrastructure and consider the Cloud,” Kemp told *On The FrontLines* in a recent interview (See page 8).

Kemp said these scientists, researchers and engineers need some high performance computing horsepower and storage at their disposal, but still don’t require supercomputing power.

For these users, their solution is found in NASA’s Nebula Cloud platform, which provides “instant-on” IT infrastructure for rapid application development, deployment and collaboration.

“What we are excited about is the scientist that couldn’t afford to buy the infrastructure they need, because they didn’t get the funding they wanted,” said Kemp.

“But they have a great idea and because Nebula is so inexpensive and accessible to them, think of the breakthroughs that might occur by giving them the compute and storage resources they need.”

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By Jeff Erlichman, Editor, *On The FrontLines*



Courtesy of NASA

A Decade Long Effort

While Nebula is Kemp’s “secret sauce” helping cultivate a “Cloud-First” culture at NASA, the stark reality is that while Cloud services are available and deliver proven IT savings and ROI, a government “Cloud-First” culture must be built over time.

Kundra acknowledged just this in his July 1, 2010 House testimony on moving to the Cloud:

“We recognize that the shift to Cloud computing will not take place overnight...we are still in the early stages of a decade-long journey. As we move to the Cloud, we must be vigilant in our efforts to ensure the security of government information (and) protect the privacy of our citizens... (and) fully consider the advantages and risks associated by defining standards and security requirements.”

The good news is that management—both technical and non-technical—sees the benefits of the Cloud:

- Its economical pay-as-you-go approach to IT
- Its flexibility to scale capacity and costs as conditions dictate
- Its rapid implementation with clear-cut procurement and certification processes
- Its consistent service and reliability
- Its effectiveness providing more time for mission-critical tasks.

Plus it is Green and energy efficient because resources are pooled.

So, whether your agency decides to use a public, private or hybrid in the future, rest-assured these benefits will drive a “Cloud-First” culture in government over the next decade. ■

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Cloud Drivers

Federal IT leaders are serious about moving from today's capital intensive Data Center IT infrastructures into flexible, agile Cloud infrastructures and software environments.

Federal CIO Vivek Kundra makes it clear how government will get the economic gains of Cloud Computing.

1. Shift to a "Cloud-First" policy
2. Identify opportunities through Data Center consolidation (FDCCI)
3. Centralize certification of Cloud solutions (FedRAMP)
4. Establish standards for security, interoperability & data portability (NIST).¹

The result will be an agile computing environment at a cost government can afford.

"There's no question cost is going to be the big driver behind Cloud adoption," declared Dave McClure, GSA's Associate Administrator of Citizen Services and Innovative Technologies, during the *Federal Executive Forum on Federal News Radio*.



Dave McClure

McClure says budget constraints are the #1 issue usually brought up by federal agencies considering Cloud infrastructure particularly.

"The attraction is to get less capital intensive. We have huge Data Centers where we have lots of infrastructure costs," explained McClure. "There's a lot of interest in trying to get out of the capital intensive nature of computing and more into this flexible, agile infrastructure and software environment." (i.e. The Cloud)

Going Down: Government's 2,094 Data Centers

Hand-in-hand with scaling up to a Cloud-based infrastructure is scaling down the number of federal Data Centers.

In their October 1, 2010 memo updating the Federal Data Center Consolidation Initiative (FDCCI), Kundra and DHS CIO Richard Spires wrote that based on agency submissions and

the definitions used, the number of federal Data Centers as of July 30, 2010 is a whopping 2,094.

The memo also says by the end of 2010, agencies will have worked with OMB to review, adjust, finalize and approve their Data Center consolidation plans. (Learn more).

"The goals of the FDCCI are to assist agencies in identifying their existing Data Center assets and to formulate consolidation plans that include a technical roadmap and consolidation targets," wrote Kundra and Spires.

By leveraging best practices from the public and private sector, agencies will be able to:

- Promote the use of Green IT by reducing the overall energy and real estate footprint of government Data Centers
- Reduce the cost of Data Center hardware, software and operations
- Increase the overall IT security posture of the government
- Shift IT investments to more efficient computing platforms and technologies.

All of these actions point directly to the adoption of Cloud technologies.

The Security Challenge

At the same time, GSA is releasing common security controls and guidelines for public comment based on NIST guidelines. "This provides the opportunity, despite the obvious challenges, to actually be more secure in a Cloud environment," said McClure.

As part of the Federal Risk Authorization and Management Program (FedRAMP) program, these steps are designed to

1. Vivek Kundra, April 7, 2010, The Economic Gains of Cloud Computing.

speed up the certification and accreditation (C&A) of Cloud products and services. It will also lower costs of security compliance, because each agency no longer will have to individually attempt to certify products and services.

According to GSA, FedRAMP is a unified government-wide risk management program focused on large outsourced and multi-agency systems. The program will initially focus on Cloud computing but will expand to other domains as the program matures.

FedRAMP provides security authorizations and continuous monitoring of shared systems that can be leveraged by agencies to both reduce their security compliance burden and provide them highly effective security services.

McClure estimates a common C&A process is a surefire way to streamline procurement and save both government and providers significant dollars.

"That's our big issue with Cloud," said McClure. "We are presented with this tremendous opportunity to use computing capacity in a very, very agile and shared environment; but we are still in a security posture where every agency takes care of itself. We have duplicative oversight, duplicative risk management, inconsistent application of the standards, so we've got those issues that we've got to address."

GSA will list the FedRAMP requirements on www.info.apps.gov and www.cio.gov. FedRAMP is scheduled to launch in FY 2011.

Building Trust

Whether it is a public, private or hybrid Cloud, agencies have to trust independent security assessments; another big cultural issue according to McClure.

"Cloud is a completely different kind of computing environment than we are used to in government," McClure noted. "Every agency has its own IT strategy, its own infrastructure, its own set of applications; so we are back into this tug and tussle of sharing computing resources across multiple tenants, multiple agencies."

Cloud accentuates culture issues because it creates an environment where you can move quickly and share infrastructure and applications across multiple entities said McClure

"Culturally, this is very difficult for government because of the control processes, the budget, the turf issues; all of which we are very familiar with." In short, it makes even harder to get to a Cloud-First culture.

This also drives the importance of interoperability and portability standards. These become extremely significant as agencies contemplate seriously how they are going to park their data in an environment they no longer actually control themselves.

In addition to standards, another key to wide-scale Cloud adoption will be to have some simple integrated way to securely authenticate staff and contractors

"At the same time, Cloud service providers are going to need to comprehensively and continuously certify the security of their services at the service provider level," added McClure.

"At the implementation level where security policies will vary significantly from team-to-team and from agency-to-agency, there needs to be some integrated framework for locally applying security controls to those services that are being provided by these service providers."

In addition to standards, another key to wide-scale Cloud adoption will be to have some simple integrated way to securely authenticate staff and contractors, so that there aren't hundreds or thousands of passwords to be managed.

Further, with the ability to provision and de-provision quickly, there needs to be a procedure to make services accessible to new users without having to go through complicated processes to provision each and every application.

If this sounds like a lot of work, it is. But once accomplished, this will be a foundation that a Cloud-First culture thrives in. ■

Spreading Clouds

During the Federal Executive Forum on Cloud, three federal executives who are on the frontlines of Cloud implementation shared their thoughts about the opportunities that abound in Cloud.

Chris Kemp
Chief Technology
Officer
NASA



Col. Kevin Foster
Office of the Secretary
of Defense



David McClure
Associate Administrator
of the Office of
Citizen Services
and Communications
GSA





Economic Gains In The Cloud

By Kevin Jackson

The New Revolution

During the 18th and through the 19th century, global society experienced drastic changes in agriculture, manufacturing, mining, transport and technology.

Known as the Industrial Revolution, this period was driven by the steam engine and marked a major turning point in human history. Almost every aspect of daily life was affected in some way. This period saw unprecedented sustained growth in both average income and population.

Key to this growth was the transformation from low volume, hand-made manufacturing to the mechanized assembly line.

The 21st century heralds yet another socioeconomic revolution, the Information Revolution. Just as before, this period promises to mark another major turning point in human history.

Today's growth in information mirrors the previous growth in manufactured goods. Could Cloud computing drive this new age just as the steam engine drove the Industrial Revolution?

New Economic Value

Cloud computing has already demonstrated an ability to enhance value within many tangible domains. The value delivered by the Cloud in infrastructure cost savings seems to be just the beginning. Business transformations and upheavals caused by Cloud computing are becoming more of a daily occurrence.

Just look at the list of new businesses and new ways of doing old businesses: eBay in the auction market; PayPal in banking; Amazon in retail and IT infrastructure sales; Animoto in video production; Blogspot, Slideshare in publication; Twitter, Google in marketing & advertising; US Government (usaspending.gov, data.gov, apps.gov) in constituent services.

Cloud increases economic opportunity while simultaneously reducing barriers to business success. Since Cloud providers actually enable this reality, could they become modern Robber Barons? Robber Barons gained enormous wealth due to their ability to corner the market on the building blocks of today's modern society. If information is building the society of tomorrow, will the likes of Google, Amazon and eBay capture the wealth of tomorrow as well?

Cloud providers also give the enterprise options that can deliver capability faster and with much less capital investment and risk. This enables more market experimentation with shorter cycle times.

This drastic reduction in upfront investment requirements

can make previously unviable business models economically feasible. Market valuations of global Cloud companies clearly demonstrate the transfer of wealth.

Less Waste, More Wealth

Cloud computing also reduces economic waste. IT resource metrics are now more easily monitored. With this capability, resource cost can be easily compared to value delivered with much less ambiguity.

Dynamic provisioning also enables faster resource reallocation. Options that deliver lower return on investment can be quickly divested. More successful options can be reinforced and expanded with much less delay.

Reduced information service response times can also spur advances in multiple unrelated domains. More capability, no matter the domain, accelerates and enhances any related business ecosystem. Acceleration and enhancement of the ecosystem inevitably leads to economic growth.

Economic growth leads to more products, more jobs and more commerce.

The Cloud's real economic value means that individuals can design, build, deploy and globally market new and competitive products from their living room with minimal investment.

[Watch Video](#)



In this scenario, the "network affect" will accelerate Cloud adoption.

Success will drive Cloud standards and increase Cloud efficiencies, making these companies even more valuable. Global Cloud infrastructures will drive the social networking phenomenon and as social networking expands, marketplaces driven by new forms of advertisement and business models will also grow.

Since Cloud computing hastens the physical instantiation of new business ideas, market upheavals will continue.

The New World Order

The real economic value of Cloud computing lies in the fact that individuals can design, build, deploy and globally market new and competitive products from their living room with minimal investment. Economic models tied to previous capital investments will prevent any adequate response from large, established market players.

Since a frictionless internet-based marketplace offers minimal pain to consumers that choose to switch, established players will falter and eventually fail. The marketplace always favors the strong. ■

Kevin L. Jackson is a senior information technologist and editor of Government Cloud Computing e-zine.

Kevin blogs regularly at Cloud Musings. Contact Kevin at <http://kevinljackson.blogspot.com>.



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How We Are Leading the Network Transformation

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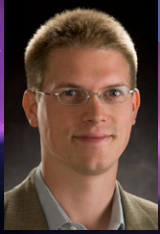
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Interview

Chris Kemp, CTO, NASA

Look for new NASA websites “where we intend to be transparent on how we do business and what we are working on. It’s going to be like “Gizmodo for space geeks”.

As NASA CTO, Kemp is responsible for NASA’s EA and introducing emerging technologies into NASA’s IT roadmap. He leads the Nebula Cloud Computing Platform program and is responsible for NASA’s contributions to the Open Government Initiative.

Because of NASA’s unique mission, there is a lot of interest in projects that involve public dissemination of data and public web projects.

An example is the World Wide Telescope project (www.worldwidetelescope.org) which used full resolution imagery from the Mars HIRISE orbiter to make the highest resolution Mars surface terrain map ever released. Powered by Nebula, click on Mars and zoom in to see images of unparalleled resolution and a full 3D Mars.

Recently, Kemp talked about Nebula and other Cloud related topics in this On The FrontLines interview.

OTFL: Why has NASA embraced Cloud computing? Is there something special or unique about NASA?

Chris Kemp, NASA: For NASA, there is a mismatch between commercial oriented platforms and the government. One issue is that most commercial platforms require a credit card and it is hard to use government credit cards to buy computer infrastructure. The other issue is security; (that’s why) we are seeing all of these providers work with the FedRAMP process to create a C&A framework.

However, even if security issues and procurement issues with consumer oriented platforms were solved, I would argue that NASA scientists would find the performance/

scale requirements and data locality issues would not be addressed by some of these commercial platforms.

The ‘secret sauce’ was listening to our customers, the end users and scientists; then figuring out what computing experience would make them stop buying a bunch of hardware infrastructure and consider the Cloud.

Since we did it internally we could be an early adopter without having to address some of the security issues because it was all behind our firewall. Finally, because we are providing it as a shared service, we don’t have to deal with credit card and procurement issues.

OTFL: Are you getting calls from fellow CTOs asking how Nebula is working?

Chris Kemp, NASA: Yes, and I’m really excited about what we have been talking about in the development community.

We are sharing what we are doing. We are contributing our code to open source communities and releasing it under an Apache license. (We are also) finding a way for people who are interested in standing up infrastructures inside their agency or their enterprise to do that without having to actually work with NASA.

NASA is in the business of space exploration. We operate a lot of IT infrastructure to support that mission, but we are not in the business of helping reinvent IT in the US government either.

Recently, we were approached by a consortium called OpenStack. We pulled together a lot of technology including Nebula technology and created an open source Cloud computing service provider platform.

OpenStack consists today of the Nebula computing code and the RACKSPACE file system code. Open source developers are in the process now of integrating that code; in fact anyone, you can today download OpenStack and get it running; you can run Nebula in your garage if you want to; you can also contribute code back to OpenStack and we will use that in Nebula.

So all of the code that NASA is writing in Nebula is making its way back into OpenStack; and all of the code written by



NASA Is In The Clouds...

In this video, Kems talks about NASA and its unique environment...it has its space mission and scientists who are collaborating with the private sector, internationally and with universities...these diverse security environments provides opportunities for more than one



Cloud... as NASA looks to meet the diverse needs of stakeholders... it will select the Cloud environment most appropriate...

[Watch Video](#)

developers for OpenStack is getting looked at by NASA.

There is an opportunity for anyone who is interested in this technology to deploy it and benefit from it and when they make contributions back to that code for NASA to benefit from it as well.

OTFL: What advice would you give agencies about moving into the Cloud?

Chris Kemp, NASA: Any agency that is interested in building a hybrid cloud infrastructure, particularly IaaS or PaaS within their firewalls, I would strongly encourage everyone to consider SaaS first before hosting apps in your Data Centers.

SaaS doesn't solve your problems but you might be able to build something on your platform. The very last thing you should look at is building IaaS locally. But if for security or performance reasons you have too, it's much better than having hundreds or thousands of pieces of infrastructure littered around different facilities.

I would encourage you not to contact us, but go to www.openstack.org, download the code, install it, contribute to it because there is a whole community there.

One of the metrics we are proud of is since OpenStack there have been more than 600 developer contributions to the code. NASA has benefited and taxpayers didn't pay a penny for it.

OTFL: What are some benefits a layperson would see coming from the Cloud?

Chris Kemp, NASA: If you are a taxpayer, more money is going to science and NASA missions and less on IT infrastructure management and operations.

Nebula is on the edge of our network. So a lot of apps will result in interesting web services. Data centric web apps are being developed like the World Wide Telescope.

We worked with OMB on USAspending (www.usaspending.gov). It is powered by Nebula and provides taxpayers visibility into trillions of dollars of federal spending. You are able to drill down; do ad hoc queries and real time graphs.

This would not be possible if you had to make the argument to buy all the infrastructure and then maybe the site doesn't work. It's hard to justify buying infrastructure for sites, concepts or research that you aren't confident you are going to see results.

(The Cloud) is a great place to host public data and provide services that provide the public transparency. If you look at

NASAs open government plan, Nebula is a major component because it is a great place to put data. It allows us to solve important problems while we make it the most secure place to do business.

OTFL: How do you spend your time?

Chris Kemp, NASA: I lead three groups. One is EA. While I think classically enterprise architects would come up with the "go to" state; I think of it differently; I see (1) where we are; (2) where we should be; and (3) the future space.

I'm not going to spend my time convincing our CIO to put in VoIP. There are many successful implementations of VoIP. What I'm thinking about is "what's next".

I run IT Labs ; our goal is to build case studies for emerging technologies and then help us understand is this something we should be doing now or is it out there; should we revisit in a year or two.

It is important is to scale fast because we don't want to spend money on three or four projects. We would rather pilot or prototype a hundred projects a year spending as little resources as possible testing them out. We bring all of that to enterprise architect and decide whether this technology could solve this problem or that problem; or it's not ready yet, because it doesn't integrate; or users have a hard time using it; or the culture isn't ready.

Then CIO doesn't spend time trying implementing emerging technologies that are just going to go nowhere.

**You can run Nebula
in your garage if you want to.
In fact anyone can download
OpenStack today and get it
running. You can also contribute
code back to OpenStack
and we will use that in Nebula.**

OTFL: How you see the Cloud evolving? What excites you?

Chris Kemp, NASA: There is so much exciting going on, but in my crystal ball I do get to cheat a little bit. Unlike a lot of my colleagues, I spend a lot of time with venture capitalists in Silicon Valley. (I see) early stage companies today that haven't launched their products yet, but the public will become acquainted with in a year or two. Then government contractors will hear about it a year or two after that; and then a year or two after that it is rolled out at NASA.

The best way to be good stewards of the taxpayers money is to really tune into what is coming out of university research; what the VCs are funding; and what they are focused on, for example from Mozilla or Google labs or Microsoft Research.

I think we are trying to get our hands on that technology first and think very carefully about how it could advance our mission. That way it's not our employees bringing it to us from our CIO shop because we already have it.

We are trying to get out ahead; so we are the smartest guys in the room when comes to IT. That's what we have been asked to do and we are trying to build a great team to do just that.

Soon, we are launching some new websites where we intend to be transparent on how we do business and talk about what we are working on. It's going to be like "Gizmodo for space geeks". ■



IT's Changing Role

Creating a Cloud-First culture changes the role of the IT professional and function in government. So get ready.

For the IT professional or for that matter the IT function itself, the wide-scale adoption of Cloud-based technologies dictates change.

How much change? To find out how, *On The FrontLines* interviewed leading private sector technologists who shared what they are seeing.

Brian Burba Vice President, Business Development, Cloud Customer Solutions Unit from CA Technologies told *On The FrontLines* he is seeing the job of actually delivering IT services moving from a standard manufacturing model to much more of a supply chain management model.

"The job of IT is going to be assembling services from all these places—from external and internal built stuff, internal clouds and external services. The job becomes a supply chain manager," explained Burba.

"Think of companies such as Boeing; they receive components at the factory; they are not building the plane, they are assembling the plane at the last mile. We think that IT will be more in that vein. Design, assembly, supply chain management is geared for the business constituents; where all the stuff comes from is less important."

That flexibility is what breaks down barriers for CIOs and specifically provides a way to get started with a private Cloud.

His colleague at CA Technologies, Bill Clark, VP, Technical Sales & Public Sector CTO, agrees.

"The concepts are not new. What is new is the ability to put a front-end in front of someone who is going to consume the service. This allows them to choose what services they want at what cost; and be able to provision and de-provision (the elasticity part) that service as needed. That is what NIST says makes for true Cloud computing."

According to Clark customers are just getting into the concept of having a "service catalog front-end" and the back-end could be where your typical operations get provisioned.

New Business Paradigm

Stephen Wallo, Principal Systems Architect, at Brocade said that what is being created is almost a new business paradigm.

"Systems administrators take care of servers and applications; network administrators take care of the network. It is a nice delineation," said Wallo.

"Now as things converge the lines start to blur. Now the network folks have to talk with the server folks. That is good, because when you have two different groups and the lines are blurred, the culture has to change."

Riverbed General Manager & Senior Director, Federal Markets Division, Bill Hartwell added that roles are changing because distributed IT evolved into everyone having their own "island of IT". While there was a lot of overarching architecture and oversight by CIOs and CTOs, they began to lose budget responsibility because these different stovepipes bought for themselves.

"If you want to do virtualization or private automated Clouds, then you will see a shift back to centralization," said Hartwell.

"If you don't, there is no cost advantage. We see shifts going on in some agencies and departments that are Cloud leaders. This is evidence that stovepipe groups are now going to have to work under a common architecture driven at a departmental level and more enterprise friendly and sensitive."

CA's Clark summed it up this way.

"The IT pro is going to have to manage a supply chain. They have to be business oriented, understand the technology and have tools that let them see the costs internal versus external. Then they can make decisions for the enterprise on what is the most cost effective way to deliver a service—internal, external or hybrid Cloud." ■

**The IT pro is going to manage
a supply chain, be business
oriented and have the tools
to decide the most
cost effective way to deliver
a service.**

when you can say yes, insight lifts performance.

The cloud is the answer. It's also the question.

Cloud computing has the potential to transform how agencies manage a comprehensive platform by offering faster, cheaper, on-demand access to services and resources. But cloud is also one of the great questions... How much should be pushed to the cloud? How to secure it? How to make it work with what you already have?

CA Technologies can help you answer those questions. We have solutions to plan, implement and monitor cloud services as part of your existing infrastructure.

And as you move to the cloud, with our security solutions, agencies can control users, their access and how the information is used in the cloud. Agencies will know who accessed the cloud services, what they accessed and how the information was used.

Say "yes" to Cloud Solutions while still securing your systems.
Learn how you can make it safer to do more:

ca.com/cloud



you can

ca
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Clear Visions Of Future Cloud Formations

Some of the best and brightest minds in the nation have their eyes clearly in the Cloud.

One clear objective of the FDCCI is to help agencies leverage best practices from the public and private sector to shift IT investments to more efficient computing platforms and technologies—i.e. the Cloud.

And since the idea is to buy less, not more brick and mortar infrastructure (whose true costs go way beyond just the price of IT), government is going to turn to the private sector to provide easy-to-use, secure Cloud-based platforms.

To learn more what future Cloud formations will look like in the next 5 years, *On The FrontLines* interviewed thought leaders from five government Cloud providers.

The Value-First Mindset

Mark Weber, NetApp, President Public Sector sees a fair number of agencies consolidating in internal Clouds; but for Cloud to really take hold in federal agencies, issues related to culture and budgets must be solved.

That includes giving up “server hugging” and shifting emphasis to acquisitions that are more service-related. “All those things come into play with Cloud adoption; and culture is an issue that is going to have to evolve over time,” said Weber.

Part of evolving culture is educating customers on getting full value from their technology choices.

“Our value proposition and our go-to-market plan with customers is not terabytes per dollar, it’s the value of each terabyte you get,” explained Weber.

“What we are talking about is storage efficiency, not just storage. We are a software company; 90% of our research and development goes into software that increases efficiency. The recipe for efficiency is not just one tool, for example deduplication or thin provisioning, but using all these different technologies to get the best value out of each terabyte you buy.”

The average terabyte sold is utilized only 30% of the time; 70% is empty waiting for something to happen; growing utilization to 70% or more delivers value that translates directly into ROI for Cloud providers and customers. That is the whole Cloud efficiency message according to Weber.

Infrastructure Evolution

John Trauth, President of Merlin also sees policy issues standing in the way of government using public Clouds.

But Trauth said the private Cloud value proposition of enhanced capacity management, elastic compute resources, the consolidation of data centers and moving away from silos gives government the economic value of having a centralized

architecture it can afford.

“The evolution of what we have learned about how to effectively run computing infrastructure and compute resources has gone from mainframes to decentralization and back as the pendulum has swung back and forth,” Trauth explained.

“Each has benefits, but it is an evolution, something we can grow over a period of time. It gives all the things we love about the mainframe, with the benefits that decentralization brings.”

Cloud computing will become a natural extension of infrastructure development. The added value to manage compute resources and reallocate resources on demand makes it unlikely to be overridden by any alternative architecture according to Trauth.

“What we will see continue is the trend surrounding tools to manage these Cloud environments. Greater active monitoring of capacity and capacity management; enhanced security to ensure isolation between virtual components and improvements in the speed of physical interconnects and the underlying hardware.”

“Look for the continued simplification of development of completely virtual networked environments,” said Trauth.

The Simple, Easy-To-Use Cloud

At Brocade, Stephen Wallo is Principal Systems Architect. He says their vision is first and foremost to make things easy and simple to use.

“We take a different approach, asking: what does it mean to be in the Cloud; how does that apply to virtualization; how can we make it simple and easy to manage?” Most importantly Wallo said everything must work with what the agency already has, leveraging resources to keep the network running at all times.

Over the next 5 years Wallo thinks Cloud standards and security will be in place. “Then you will see technologies arise that leverage what’s already available and providers will be able to leverage each other’s core strengths to build new capabilities.”

Wallo advises program managers when they talk to their IT departments about the Cloud, they ask these pros to seek out as many companies as they can.

“Ask what their vision is; ask how do I grow into something that enables me to do virtualization and Cloud?” counsels Wallo. “You can’t get there immediately; you have to ask ‘how do I get to where I want to go?’” And of course, make it simple and easy to use.

Centralized Distributed Computing

While looking to the future, first don't overlook your infrastructure—and the ROI it can provide quickly—in place today said Bill Hartwell, General Manager & Senior Director, Federal Markets Division, Riverbed Technology.

"Give them ability to see the ROI. Once you start to realize what you want to optimize and accelerate, then you have huge opportunities to consolidate and modernize," said Hartwell.

"The speed agencies decide to make those decisions will totally impact their ROI. I encourage them to do it now; don't wait, because the longer you wait it reduces your ROI," Hartwell asserted. "There are plenty of agencies already doing this, so don't feel like this is so early that it is high risk, because frankly it isn't."

Hartwell looks to the future and sees acceleration technologies that solve limited bandwidth and latency issues, which translate into application performance issues. If apps run too slow, productivity gains are lost.

"The real problem of an agency like NIH or VA is they have thousands of employees and contractors they must communicate with daily at hundreds of sites nationwide and worldwide," explained Hartwell.

"Anybody that is remote—outside of the LAN—is going to be dependent on how that app performs over that wide area network and latency is the big killer to an app's performance because of distance. It is very important that if you have technologies that can eliminate latency from that pipe; Just doing that reaps huge performance gains and defrays bandwidth upgrade costs for years."

Hartwell believes the federal government is going to migrate to several, if not many private Clouds.

"My vision is very large and virtual Data Centers that you may not know where they are; but it doesn't matter where the Data Center or you are located, because you have real time performance for data and apps, whether you are a fixed or mobile user; you'll get high performance in real time around the globe. I think they will be using optimization and acceleration technologies to build those private Clouds and will virtualize and consolidate in the process."

So, computing will be more centralized but will have the appearance of being distributed in the way that people can collaborate on global basis.

Order Full Business Applications From A Catalog of Services

Brian Burba, Vice President, Business Development, Cloud Customer Solutions Unit at CA Technologies thinks the big trend over the next five years is that "compute becomes incidental, almost like the network has become incidental."

The network has become so standardized, there is no real rocket science there anymore said Burba. "With compute it will be the same thing. What will change is above that compute space; the work of assembling technology solutions that actually stands up the application and makes the application as a business service go."

Burba described extraordinary productivity improvements that will change the way IT capabilities and services are built and acquired.

Imagine a world where you don't order servers and build things up from your IT group; simply there is a catalog of solutions, you just pull from the catalog and the entry includes everything you need to roll out that business service pre-configured.

"You are going to get agility with new efficiencies in that arena. That is the fulcrum of agility; where the rubber meets the road in terms of standing something up."

"Imagine a world where you don't order servers and build things up from your IT group; simply there is a catalog of solutions, you just pull from the catalog and the entry includes everything you need to roll out that business service."

So, all the components are preconfigured, prewired, pretested and ready to go. You get whole application stack and that allows you to do new things much faster, plus you maintain existing things at far less expense.

We see a group emerging called Applications Operations Burba said.

"This is kind of place where the app developers and those who stand it up come together; because the stack that developers need can be available to them in an instant not just for testing, but for production. We see the timeline collapsing from months and weeks to days, hours and minutes to stand things up." ■

Resource Center

All links available at www.onthefrontlines.net/cloud.

Websites

- American Council For Technology
- Apps.gov (GSA)
- CIO Council
- CIO Council
- Cloud Musings Blog (Kevin Jackson)
- Cloudbook
- Effective Government eMagazine
- Federal Cloud Blog (Federal News Radio)
- Federal Cloud Computing Wiki
- FedRAMP—Federal Risk and Authorization Management Program
- How Cloud Works
- Linux Foundation
- Nebula Cloud Computing Platform (NASA)
- NIST
- OpenStack—The Open Source, Open Standards Cloud
- Ulitzer Government Cloud
- USASpending.gov
- Worldwide Telescope

Case Studies, Research, White Papers & Special Reports

- Army Experience Center
- Brookings Institution, Economic Gains of Cloud Computing
- Cloud Computing
- Cloud Computing Basics
- Cloud Computing Concepts
- Cloud Computing: An Operational Perspective from DISA
- Cloud Definition—NIST
- Effectively & Securely Using the Cloud Computing Paradigm (NIST)
- Federal Cloud Computing Initiative (GSA Presentation)
- Federal Data Center Consolidation Initiative FAQs
- Federal Data Center Consolidation Initiative Final Baseline Inventory
- Federal Data Center Consolidation Initiative Initial Data Center Consolidation Plan
- Government Cloud Computing (Dataline)
- Magellan—DOE
- Moving Into The Cloud Step By Step—Dave Linthicum
- Moving To The Cloud
- Ongoing Virtualization Activities at NRC
- Open Cloud Manifesto
- Privacy Recommendations for the Use of Cloud Computing by Federal Departments and Agencies
- Public Sector Cloud Computing Case Study: Agency-wide E-mail
- Industry Trends and Vision Evolution toward Data Center Virtualization and Private Clouds—Brocade

- Public Sector Cloud Computing Case Study: Be a Martian
- Public Sector Cloud Computing Case Study: Case Management System
- Public Sector Cloud Computing Case Study: Cloud Computing Migration
- Public Sector Cloud Computing Case Study: Enterprise Data Center Strategy
- Public Sector Cloud Computing Case Study: Forge.mil
- Public Sector Cloud Computing Case Study: Online Answers Knowledgebase (SOASK)
- Public Sector Cloud Computing Case Study: Rapid Access Computing Environment
- Public Sector Cloud Computing Case Study: Recovery Accountability and Transparency Board
- Public Sector Cloud Computing Case Study: Securities and Exchange Commission
- Public Sector Cloud Computing Case Study: Supporting Electronic Health Records
- Public Sector Cloud Computing Case Study: USA.gov
- Public Sector Cloud Computing Case Study: World-Wide Telescope
- State of Public Sector Cloud Computing Case Study: Personnel Services Delivery Transformation
- Streaming at 1:00: In the Cloud
- Transition to IPv6
- Update on the Federal Data Center Consolidation Initiative
- Vivek Kundra Testimony on “Cloud Computing: Benefits and Risks of Moving Federal IT into the Cloud”
- Vivek Kundra, Federal CIO—House of Representative Testimony, July 2010
- Vivek Kundra, Federal CIO—The Economic Gains of Cloud Computing
- Vivek Kundra—State of Cloud Computing - May 2010

Future Vision Videos

Federal Cloud leaders talk about their Cloud formations in the future during the Federal Executive Forum on Federal News Radio.



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