The Acceptance of Cloud Computing in the Federal Government
How we got here, and what to do next

A GTRA Research Brief

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Introduction

Only a few years ago, the term "Cloud Computing" was known only to the hyper-savvy techies of the world. Today, hardly a week goes by where technology publications and e-newsletters don't mention the term and how it is revolutionizing the federal IT landscape. In 2009, GTRA has seen government executives go from bewilderment to general acceptance of Cloud as a viable model. In this research brief, we look at the key factors which have lead to Cloud's acceptance, address the top concern federal executives have vis-à-vis implementing Cloud Networks, and take a glimpse into the future to see what government executives should do next.

- *Parham Eftekhari*

"Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models."

NIST Definition of Cloud Computing v15

The Rise of Cloud: Needs Driven or Effective Marketing?

When Vivek Kundra was appointed the first CIO of the federal government, it seemed that Cloud Computing was on the tip of his tongue from day one. Mr. Kundra's proclamations of the benefits Cloud Computing would bring to the Federal IT landscape quickly yielded a slew of articles, blogs, tweets and announcements in support of the movement. Cloud Computing even got included in the 2010 official budget request which stated that all agencies should be working towards "vitalizing data centers, consolidating data centers and operations, and ultimately adopting a cloud-computing business model."

With all the fanfare surrounding Cloud, and the federal CIO as its biggest cheerleader, it seemed no one would be willing to question what equated to a complete overhaul of the current federal IT infrastructure!   However, critics soon began to voice their concerns about security, availability, and data-rights ownership.

A year into things it is clear that the question is not *if,* but *when* agencies will implement Cloud Computing on a wide scale- but how did we reach this point so quickly? As you will read in the next section, GTRA believes it is due to a number of factors, propaganda having nothing to do with it.

Factors in the Acceptance of Cloud Computing

Based on Industry observations and research conducted with the federal IT community, GTRA fully believes that acceptance of Cloud Computing has grown not due to a follower-mentality, but because of the following key factors:

Education- When Government leaders first began to discuss Cloud Computing in research interviews over a year ago, the overwhelming consensus was "I know it's important, but I don't really know what it is!" Since then, Government and Industry education on Cloud has helped give executives a clear understanding on what Cloud is, the risks to be aware of, and the benefits it can bring. With increased comfort, comes increased acceptance.

Economics- Executives have begun to understand the economic benefits that Cloud Computing can bring to their IT budget, and the valuable human capital resources it can free up. Not only are savings achieved by reducing hardware, software, maintenance and data-center costs, but man-hours previously used to support these things are now freed up and can be used on more strategic organizational initiatives.

Leadership- Mr. Kundra's reputation and proven track record for success when serving as CTO of Washington D.C. made him an excellent voice supporting this new model of delivering services, infrastructures and platforms. In addition, other 'early adopters' in the federal government who stepped into the unknown world of Cloud because of the benefits they perceived helped pave the way for others to both learn and follow-suit.

It's been around, just by a different name- Remember 4-5 years ago when "Software-as-a-Service" was THE buzz-word? In hindsight, it sounds remarkably similar to the concepts associated with Cloud Computing... That's because they are essentially one-in-the-same! As storage, application, platform and infrastructure needs changed and economic realities forced IT users to look at innovative solutions, 'on-demand' service models began to pop-up everywhere, and were eventually referred to collectively as "Cloud Computing". As people began to make this connection, and realize that this "new" concept wasn't really all that new (some were even already running a Cloud on their network without even knowing it!), adoption and acceptance began to increase.

Ease of Purchase- The launch of Apps.gov, the first government acquisition portal built specifically to make procurement of Cloud Computing solutions easier was a critical step to help further promote the use of Cloud services.

Industry - The role Industry plays in building acceptance of Cloud Computing cannot be emphasized enough. With consultants such as Booze Allen Hamilton and Accenture helping educate the federal community, to innovative solutions from the likes of Qualys, Fortify and Cisco, the Government-to-Industry partnership has and will be critical to the widespread adoption and success of Cloud Computing in the Government.

Can there be Trust in the Cloud?

"Yes!" said Peter Mell (Vice Chair of the interagency Cloud Computing Advisory Council; Acting Chair of the Federal Cloud Computing Security Working Group) as he delivered a keynote titled with the same question at the December 2009 GTRA Council Meeting. Yet this question alone accounts for most of the concerns executives (and their Chief Information Security Officers) have over implementing Cloud in their infrastructure. GTRA research showed that the most common concern about implementing Cloud programs was security and privacy, a finding supported by an IDC study of 244 CIOs on Cloud Computing where 75% of respondents listed Security as their number one concern[1].

GTRA believes that despite the very valid concerns surrounding Cloud Computing and the need for education on how to securely deliver applications and services via a Cloud, they are not enough to overshadow the tremendous advantages it brings. Below are a few of the reasons why:

Experts Agree- Like Mr. Mell, dozens of well respected government and IT leaders have weighed in and said when done correctly, Cloud Computing can bring tremendous benefits to an organization without sacrificing security.

Success Stories- While more exist than we probably know about, increasing numbers of successful Cloud Computing implementation stories are being shared which are proving that the Cloud can indeed be secured.

> Example: At the December 2009 GTRA Council Meeting, Roger Mahach (Chief Information Security and Privacy Officer, OCC, Treasury) presented a case study on his agency's decision to deliver OCC's vulnerability assessment tool via a Cloud and the monetary and human capital savings realized by the move.

Better understanding of the Who and What- Executives have begun to more clearly understand how Cloud works, which is allowing them to make more educated decisions on what data to store on clouds, the use of public vs. private clouds and who has access to them, two crucial factors to consider when using Cloud.

Government/Industry/Academia Partnerships- Dozens of partnerships and research initiatives exist today up which are pooling resources from multiple sectors explicitly to support the move towards the Cloud model. In addition, there currently exist over 8 federally sponsored working groups on Cloud Computing (and dozens more at the agency and department level!). These focused efforts have and will continue to deliver knowledge on how to address security concerns regarding Cloud Computing.

"To make Cloud Work, you need to fully understand two critical things: who your users are and what data you have."

- Chris Kemp, CIO, Ames Research Center, NASA; December 2009 GTRA Council Meeting

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[1] *IT Cloud Services User Survey, pt.3: What Users Want from Cloud Services Providers; published via IDC Blog October 3rd, 2008*

What's next?

As stated earlier in this brief, Cloud Computing is not simply a trend but represents a fundamental shift in the strategy which goes into building networks and in how applications, infrastructure, and platforms are delivered and used by the federal government. Still in its infancy stage, executives are experimenting with it, learning more about it, and becoming more familiar with it. So what's next for Cloud Computing in the government? GTRA believes it can be summed up in one phrase: <u>From Discovery to Strategic and Moderate Action!</u>

At the December 2009 GTRA Council Meeting, both Keynotes which focused on Cloud Computing gave similar messages: the Government as a whole has had sufficient time to test and learn about Cloud to confidently decide it is the way to go, now it's time to start using it- but start slow!   In his keynote, Peter Mell eloquently stated his personal belief that while 2009 was the year of "Discovery," 2010 would be the year of "Experimentation." GTRA research supports this, as government executives are less frequently asking basic questions like "What is a Cloud?" and have now begun to ask forward looking questions like "How do I implement this in my agency?" Echoing Mr. Mell's beliefs and giving some advice, Chris Kemp (CIO, Ames Research Center, NASA) suggested that executives new to the cloud should use commercially available products or model their initiatives after other completed agency programs to build a test pilot before taking on large-scale initiatives.

GTRA believes the most important thing to remember is <mark>that while should move forward confident that government leadership</mark>, IT experts and case studies are correct <mark>is</mark> giving a "thumbs up" to cloud, it should do so with a cautious and strategic approach which takes into consideration the advice, lessons learned, and guidance available to executives today.

When we as a community become fully versed and experienced in the concepts and realities of Cloud Computing, it will become like second nature to us. Until then, let's move forward confidently, yet cautiously.