

JULY 2017

## THE ENTERPRISE CLOUD BALANCING ACT

# Emerging Trends in the U.S. Federal Government

### Executive Summary

Almost seven years ago, the White House issued its 25-point Implementation Plan<sup>i</sup> to reform federal IT that mandated federal agencies “evaluate safe, secure, cloud computing options before making any new IT investments.” The intent of this Cloud First mandate was “to accelerate the pace at which the government will realize the value of cloud computing<sup>ii</sup>.” The U.S. federal government seems poised to enter a new era of cloud computing after the last seven years of trial and error yielded important lessons learned and repeatable best practices. What about cloud is working or not working? Are federal agencies fully realizing the promised cost savings? How pervasive is cloud adoption? What workloads are agencies putting into the cloud? Nutanix commissioned Market Connections to survey a representative audience of federal IT managers and leaders to find the answers to these questions. Our findings are discussed in detail in this paper.

At first blush, it appears the public cloud hasn’t been a panacea to solve the resource constraints federal agencies face. As agencies move silos of infrastructure to a different medium, they feel the public cloud is not entirely living up to its promise — in the public cloud, they must get used to giving up control over infrastructure management (29%) and it does not necessarily reduce IT costs (29%). More than one-quarter (28%) say some internal applications are more cost-effective to run on their own infrastructure. But, as with any complex issue, drilling down into the details below the surface revealed some interesting and surprising facts.

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Market Connections conducted a blind, online survey of 150 federal defense and civilian IT decision makers to better understand if and how the cloud is working for the federal government, and to examine the path forward. Forty-five percent of respondents were from the U.S. Department of Defense, military services or intelligence agencies, and civilian agencies from the legislative, executive and judicial branches comprised the remainder. All respondents were familiar with their agency’s cloud usage, including evaluating, recommending, purchasing and implementing those solutions. The following brief analyzes their feedback to help better understand the current state of cloud computing in the federal IT enterprise, and to provide recommendations for continuing progress.

### The Cost of Cloud

**“When you look at the amortization of the cost over a three-year period, private cloud makes a lot of sense financially for the mission critical workloads. It is also more secure and technically easier to adapt to the agencies’ current systems. For the smaller subset of dynamic workloads, the public cloud is a good option.”**

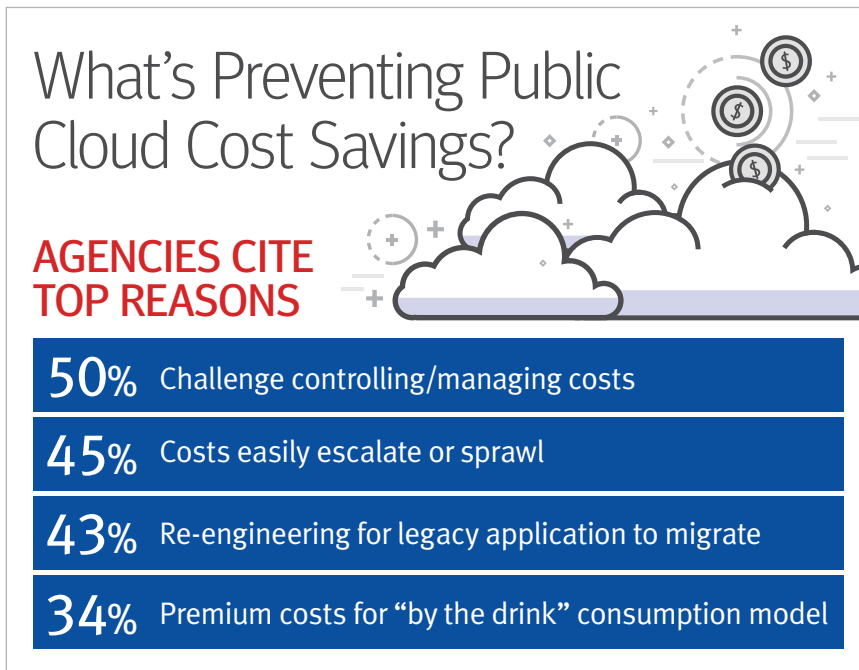
DAN FALLON, *Director, Systems Engineering, U.S. Federal, Nutanix*

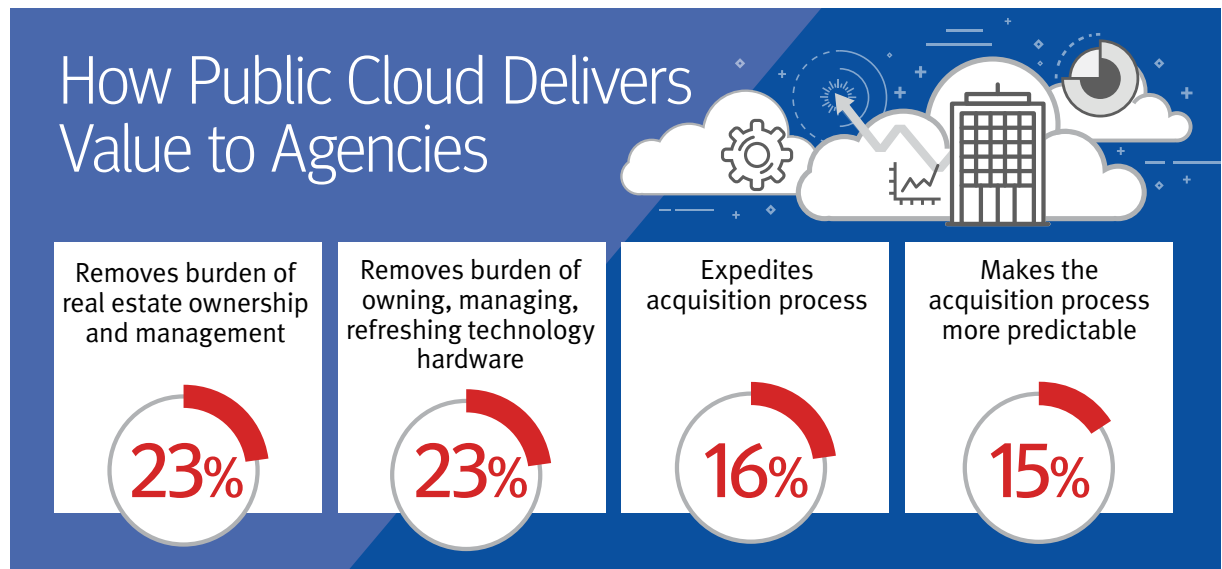
As with most IT investments, cost is ultimately one of the greatest concerns. While 39% of respondents who were public cloud users indicated seeing “great” cost savings, the majority — 61% — indicated lackluster results, ranging from ‘some savings’ to ‘no savings’.

For the agencies that have been fine-tuning the public/private mix in their hybrid cloud, the number of respondents indicating “great” cost savings jumped to 50%, suggesting that the larger savings is more accessible in the hybrid cloud approach.

The respondents that have seen “little” to “some” cost savings from the public cloud cite a variety of reasons for this:

- Challenge in controlling/managing costs (50%)
- Too easy for costs to escalate or sprawl (45%)
- Legacy applications require significant re-engineering to migrate to the cloud (43%)
- Premium costs associated with “by the drink” consumption model (34%)





However, the respondents also say that it:

- Removes the burden of real estate ownership and management from the government (23%)
- Removes the burden of owning, managing, refreshing technology hardware (23%)
- Expedites the acquisition process, making it easier to get resources (16%)
- Makes the acquisition process more predictable due to the advantages of OPEX versus CAPEX expenditures (15%)

Bottom line: cost savings from public cloud to-date has not lived up to the hype. But cost savings and other business and process benefits are clearly accessible. Do the workloads running in the cloud make a difference?

### Not All Workloads are Equal in the Cloud

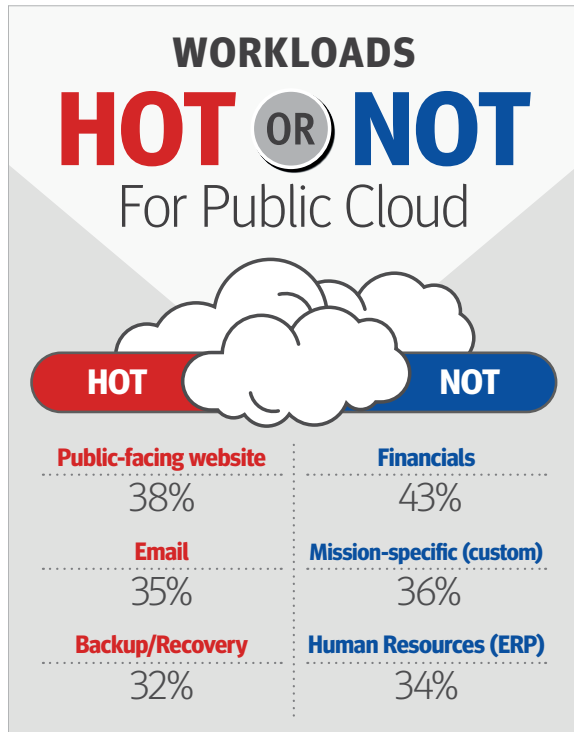
Survey respondents noted a distinct preference for some workloads over others for public and private cloud usage — not all application workloads were deemed suitable for public cloud. Dan Fallon, Senior Director of Systems Engineering for the Nutanix Federal team, noted that in most agencies, at least 75 percent of workloads are static — predictable, always-on applications that are steady-state day after day, such as financials, HR, email and content management. The other 25 percent are dynamic — they experience peaks and valleys in usage. For example, dynamic workloads may include managing first responders during a natural disaster or large volumes of data during tax season.

The nature of static and dynamic workloads makes the cost of running them in a public cloud environment very different. Think of the difference between a rented or owned home and a hotel room. In the majority of cases, it's not practical to live at a hotel, since the cost includes many amenities and services that are less expensive to provide yourself in your own home. Plus, hotel stays are priced for short-term, finite visits — which is how people mostly use them. Likewise, it's not practical to rent or purchase a home to stay at for a business trip. Our homes are much more practical for meeting our day-to-day living needs than hotels, which is why we live at one and visit the other.

Interestingly, the top three workloads survey respondents prefer to run in public cloud were public-facing websites (38%), email (35%) and data backup/recovery (32%) — generally the lower-risk, static workloads.

Public-facing websites and email are two examples of the static, always-on workloads, that are easier and more cost-effective to maintain — to live — in an organization’s own data center. The infrastructure investment is minimal, and capacity requirements are relatively predictable. However, it’s easy to see why these workloads are viewed more favorably for the public cloud,

than, say, a mission critical application. “If a website goes down, there is a lot of visibility, but at the end of the day, it is not impacting the mission. If your back-end system goes down, it could be mission-impacting. Agencies want and need more control of the system running those mission-critical applications,” added Fallon. But the costs tend to be higher with these.



Public clouds, by contrast, are optimal for spiky, unpredictable workloads — when extra capacity is needed for a finite period of time – i.e., when the workload needs to “visit,” but not live there. This helps agencies avoid the need to purchase resources for their occasional maximum usage periods, and limit their run-rate costs to support the steadier day-to-day operations. For moments of intensity — tax season, the decennial census, a response to a natural disaster, or website overload — the public cloud offers a great way to get more capacity for a limited time, which is more cost-effective than leaving that meter on 24x7x365. And yet, these are the types of workloads that agencies require control of the system running them. Not surprisingly, the three application workloads respondents viewed as least suited for the public cloud were financials (43%), custom or mission-specific applications (36%), and human resources/ERP applications (34%).

The results show a reluctance to trust high-risk, high-impact application workloads in the public cloud. One reason may be the challenges surrounding the dependence on legacy systems, which 43% of respondents noted as a reason they hadn’t realized more cost savings from their cloud initiatives.

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**According to the CIO Council’s “State of Federal Information Technology,”<sup>1</sup> agencies are still spending more on OPEX to maintain legacy systems rather than making CAPEX investments in innovation. Regarding cloud, the report says: “as agency users access more bandwidth-intensive cloud-based services, aging agency network infrastructure can struggle to meet the demand.”**

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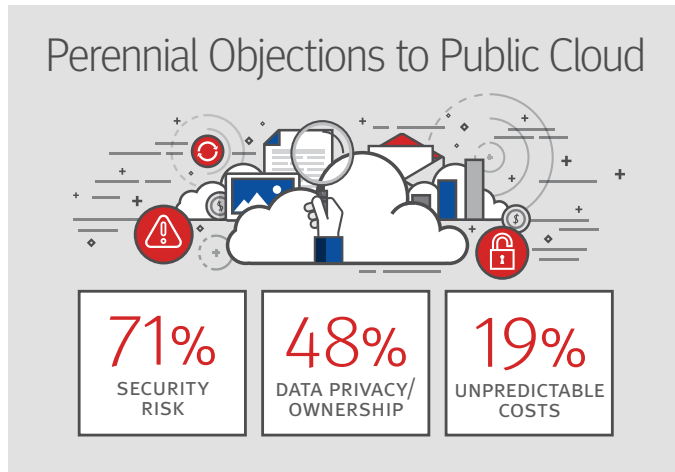
Bottom line: the type of workloads that respondents prefer the public cloud for were the ones that least need the agility and scalability the public cloud offers. At the same time, respondents felt the workloads that could benefit the most from running in the public cloud were least suited for it. One reason for this may be that security and privacy are the primary concerns.

<sup>1</sup> CIO Council. “State of Federal Information Technology.” January 2017. <https://cio.gov/wp-content/uploads/2017/01/CIO-Council-State-of-Federal-IT-Report-January-2017.pdf>, accessed May 23, 2017.



## Security and Privacy: Perennial Objections

Despite the realized benefits and continued investment in public cloud, agencies are still reluctant to utilize it for all types of workloads. Security (71%) and data ownership/privacy (48%) are the top reasons respondents cited not using public cloud, or not using it more.



Fallon says this makes sense when you consider that any time data leaves the data center boundary, it could be going anywhere. That adds a layer of complexity regarding security and data privacy to consider, and agencies do not yet have confidence in public cloud providers to address those concerns.

Study results bear out the concerns over security, data ownership and privacy, since after seven years of incremental steps to adopt cloud, respondents still prefer the easier, lower impact workloads to run in the public cloud.

Bottom line: in the end, it’s not a question of public or private. Developing a level of trust and expertise to get the best of both formats is going to reduce costs, improve performance and access to resources, and optimize the way agencies are using IT to achieve their mission.

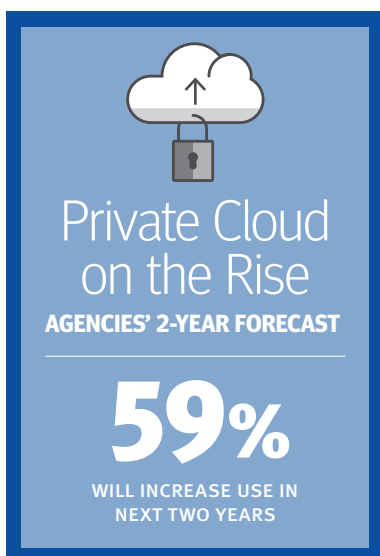
## Hybrid: The Right Mix

As agencies learn what works best for their specific environment, and adjust as needed, they are thinking about how to optimize the use of the public cloud. This is reflected in agency two-year forecasts: nearly two-thirds of agencies that are the heaviest users of public cloud say they will reduce or maintain a flat volume of workloads they run in that cloud over the next two years.

“These agencies see the full potential of cloud, and are leveraging a mix of private and public cloud to get the most out of both,” said Fallon. Operationally superior environments are using a combination of public and private cloud, leveraging public cloud for dynamic workloads and acute needs, and private cloud for static day-to-day operations. In a hybrid environment, agencies can burst the data and application layer out to the public cloud when needed, and get everything back when the need has been met. And the appeal is that mission-critical applications stay on premise, where agencies control the security and access to the data.

The data shows agencies are recognizing a hybrid approach is optimal. This may be why 59% of those who currently use a hybrid cloud model expect to increase the proportion of their workloads in their private or on-premise cloud over the next two years. Interestingly, this group of respondents noted that they had realized cost savings with their public cloud initiatives at a rate of almost 2:1, compared to those who were not leveraging a hybrid model.

Bottom line: the static versus dynamic workload needs are a key factor when deciding whether to use public cloud, private cloud or a hybrid approach. It’s important to think about how to optimize cloud consumption to reach the most effective model for the mission.





## Conclusion

Seven years after the Cloud First mandate, it is clear that agencies can realize the initial promise of the cloud. The cloud can provide cost savings, efficiencies and scalability when the plan is clear and the agency is leveraging the power of both public and private models — in concert — as a hybrid cloud. The study revealed three key trends in cloud adoption: security and data ownership remain the top inhibitors to exploring and expanding agencies' use of public cloud; not all workloads are deemed suitable for the public cloud; and the most experienced cloud users are seeking a balance of public and private cloud consumption to cut costs and enhance performance.

When agencies use a hybrid approach, they can prioritize and optimize where to run which workloads, according to their needs. And that intersection is where success may be found.

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### ENDNOTES

i <https://cio.gov/wp-content/uploads/downloads/2012/09/25-Point-Implementation-Plan-to-Reform-Federal-IT.pdf>

ii <https://cio.gov/wp-content/uploads/downloads/2012/09/Federal-Cloud-Computing-Strategy.pdf>



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The Nutanix enterprise cloud platform leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications.

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