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## Case Study: USA.gov Achieves Cloud Bursting Efficiency Using Terremark's Enterprise Cloud

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### EXECUTIVE SUMMARY

USA.gov, one of the busiest US government Web sites, has achieved significant cost savings by embracing cloud computing. The US General Services Administration (GSA) has migrated all of the core resources of the USA.gov Web portal to Terremark's IaaS platform, The Enterprise Cloud. By using The Enterprise Cloud, USA.gov can maintain a small persistent footprint and deploy on-demand scaling as traffic fluctuates. GSA said this migration to the cloud has brought about a number of benefits and savings, such as avoiding idle server costs while still accommodating huge traffic spikes, acting on users' requests in real time, and applying security constraints atop this platform. With infrastructure flexibility at the foundation, GSA has found both cost savings and capability improvement with its new cloud platform.

### SITUATION: SPIKY AND UNPREDICTABLE USER-FACING APPLICATIONS

When you need important information about the government and government services, the best place to go is USA.gov, official Web portal and resource for the federal government. This Web site is designed to help the public interact with the government more efficiently by directing people to a wide variety of government services such as grant instructions, consumer guides, health and nutrition updates, tax forms, driver's license renewal, voter registration, student financial aid, and critical national disaster information. This award-winning interagency-run Web site connects local, state, and federal governments to one central, linked resource for the benefit of the public.<sup>1</sup>

What does this mean logistically? On any given day, USA.gov receives approximately 100 million visits. However, because this Web site serves primarily as a hub for accessing critical information, traffic varies substantially. For instance, when unemployment statistics are released or during a hurricane, traffic increases dramatically. During high traffic periods in the past, users suffered long delays and downtime. To accommodate these spikes, GSA procured and deployed hardware that for the most part sat idle — needlessly wasting power. Not only did GSA need a new solution to improve service, but it also needed to meet significant security regulations, such as multifactor authentication (MFA), resource tracking, packet flow analysis, PCI compliance, the Health Insurance Portability and Accountability Act (HIPAA), and on-site security at the data center facility.

## BEST PRACTICE: USA.GOV USES CLOUD BURSTING TO HANDLE TRAFFIC FLUCTUATION

Finding the right combination of business requirements and applications is the key to success when considering moving to the cloud. Some of the most successful cloud deployments involve Web applications with unpredictable traffic patterns, capitalizing on the pay-per-use structure. The USA.gov situation fits nicely into this category of applications. In its deployment, GSA took into consideration the following elements:

- **Flexibility of the cloud computing platform.** GSA uses Terremark's self-service, portal-based cloud service, The Enterprise Cloud. In this infrastructure-as-a-service (IaaS) platform, USA.gov has a minimum baseline capacity on a 12-month contract, while the rest is all burst capacity or flexible capacity. In other words, when traffic is at normal levels, GSA pays only the contracted baseline fee — but it can accommodate large traffic when needed and not pay for it when it's not needed. As GSA never knows exactly what kind of capacity it will need, it made perfect sense to move to a cloud platform of this benefit.
- **Minimal time for migration.** USA.gov required a short, quick migration and testing process. The site had previously been deployed in-house on Egenera BladeFrame systems, which store workloads in VMs — making the transition to Terremark's VM-based cloud platform simple. The actual migration took 10 days, while the test validation occurred over the course of a single weekend.
- **Additional security elements.** Terremark designed its multitenant environment to meet the rigorous security monitoring and transparency demands of customers like government agencies. With only a few adjustments, GSA was able to get the monitoring and reporting it desired to manage this environment. In addition to these adjustments, GSA added a number of its own security elements atop this cloud environment. GSA required multifactor authentication (MFA) to access the USA.gov administrative portal, along with resource tracking, 128-bit encryption for traffic, and packet flow analysis. GSA's cloud resides in Terremark's Culpeper, Va. data center that also meets special security and defense requirements.<sup>2</sup>

## Best Practice Results: USA.gov Cuts Costs And Improves Capabilities

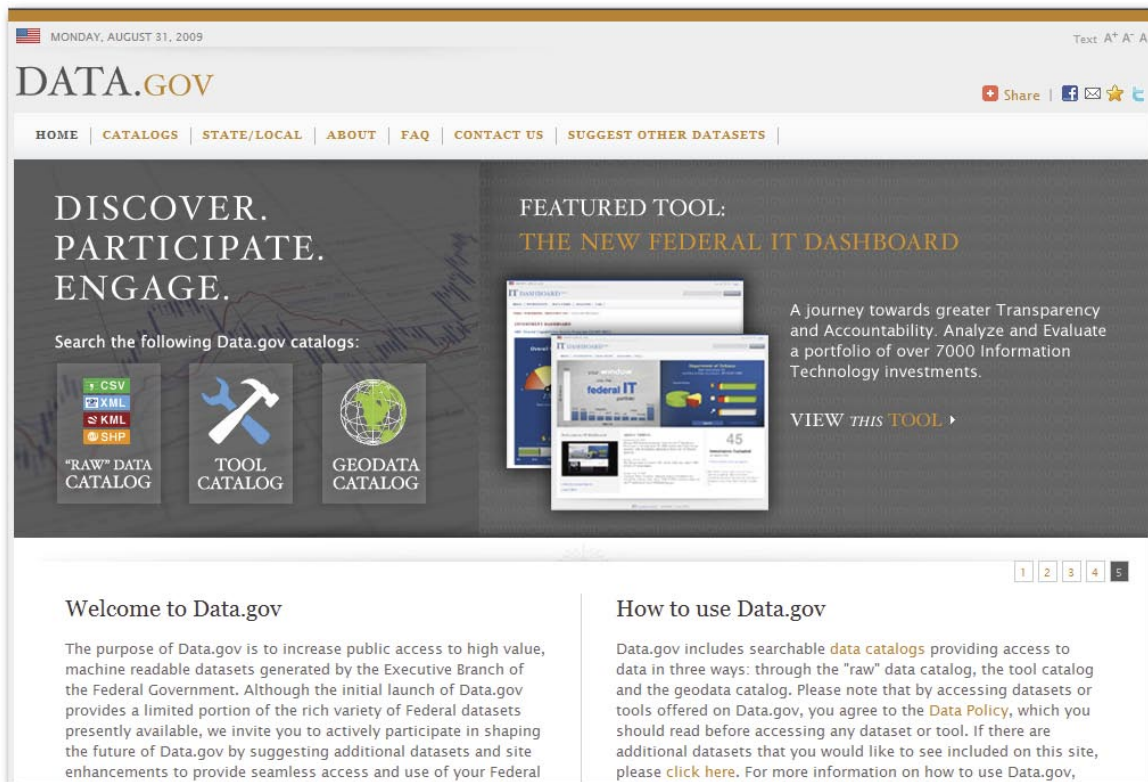
Deputy Associate Administrator of The Office of Citizen Services, Martha Dorris, has estimated that the move to Terremark's cloud platform will cut costs by 90%, while improving capabilities with the newfound infrastructure flexibility.<sup>3</sup> Originally, customer requests were assigned a ticket that GSA members had to act on to fulfill the request. Through the portal, each customer request is acted on in real time. There's no cheating on the backend, so it's fully automated.

## NEXT STEPS: USA.GOV DISCUSSES PLANS FOR EXPANSION OF CLOUD RESOURCES

Moving forward, GSA has a few ideas in the works for further using the Terremark Enterprise Cloud. These ideas include:

- **Connecting the customer's cloud pool directly to dedicated resources.** By leveraging Terremark's network architecture and GSA's added security, the agency plans to link IaaS and traditionally deployed applications. The service provider expects to bridge the two environments via secure, low latency VLAN links. This will let GSA place resources in either environment based on cost efficiency, architectural constraints, or other reasons.
- **Automating on-demand expansion of storage capacity.** GSA is also considering moving Data.gov to the same cloud platform sometime in the next year. Data.gov is a public warehouse of all data feeds the government makes available to citizens (see Figure 1). Moving this Web site to an IaaS cloud service would let users access data for building mashups or integrating with other Web sites. If GSA decided to make this switch, it would be cutting-edge in the cloud world.
- **Exposing infrastructure APIs.** Exposing APIs to USA.gov would let users build mashups of its content and access data programmatically — allowing them to access the information without going through the Web site. The GSA team has yet to determine whether this will be a next step for them. They're discussing whether it's beneficial to keep customers accessing through the Web interface or if the team should move forward with exposing the infrastructure APIs instead.

**Figure 1** Data.gov May Be The Next Government Web Site To Move To The Cloud



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Source: Forrester Research, Inc.

## ENDNOTES

- <sup>1</sup> In June 2009, the Brookings Institution named USA.gov the No. 1 federal government Web site, and Web100.com has rated it No. 48 in its "Top 100 Websites" — above AOL, NPR, Fandango, MSNBC, and Yelp. Source: USA.gov (<http://www.usa.gov/About/Awards.shtml>).
- <sup>2</sup> The data center campus in Culpeper, Va. needs to meet a number of on-premises security requirements. Some measures that Terremark has taken include: 250 motion sensor cameras, Department of Defense-approved fences, and blast-proof exteriors. Source: J. Nicholas Hoover, "Inside Terremark's Secure Government Data Center," *InformationWeek*, July 28, 2009 (<http://www.informationweek.com/news/government/cloud-saas/showArticle.jhtml?articleID=218700118>).
- <sup>3</sup> Martha Dorris, acting deputy associate administrator for the General Services Administration's (GSA) Office of Citizen Services and Communications, said the move will cut the portal's infrastructure costs by as much as 90% and improve its capabilities. Source: Steve Towns, "Federal Web Portal Moves to Cloud Computing Platform," *Government Technology*, May 1, 2009 (<http://www.govtech.com/gt/654240>).

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