

The background of the cover is a photograph of several tall, fluted classical columns, likely from a government building, with a set of steps in the foreground. A semi-transparent geometric pattern of overlapping triangles is overlaid on the right side of the image.

# Federal Roadmap to Your Cloud

Achieve Greater Efficiency  
and Contain Costs

“Facing increasing IT complexity and budget pressures, Federal IT leaders are deploying VMware cloud infrastructure solutions to meet recent executive directives cost effectively, efficiently and securely.”

**Doug Bourgeois**

VP, Chief Cloud Executive, VMware Federal

**VMware solutions support recent government mandates, including:**

Executive Order 13514 directing agencies to improve energy efficiency and reduce greenhouse initiatives by 30% by 2015 (President Obama)

The Federal Data Center Consolidation Initiative to assist agencies in reducing existing datacenters within the next five years and put those plans in the fiscal 2011 and 2012 budgets (OMB)

Telework Enhancement Act of 2010, H.R.1722 (President Obama)

25 Point Implementation Plan to Reform Federal Information Technology Management (OMB)

# Enabling Federal IT Transformation

New mandates are driving change across the U.S. Federal government, emphasizing the use of modern technologies to achieve greater efficiency and contain costs. Directives such as the Office of Management and Budget's (OMB's) 25 Point Implementation Plan to Reform Federal Information Technology Management present major challenges and opportunities for Federal IT leaders. Most agencies are assessing how to effectively knit legacy and new applications and architectures together into modern working infrastructure. Many need to support a more diversely equipped workforce and meet new requirements for greater responsiveness and agility. All need to do more with less.

Federal datacenters, which house an enormous wealth of legacy assets, are the primary targets for agencies evaluating different cloud computing approaches. As agencies work to consolidate existing datacenters and reduce infrastructure sprawl through a "Cloud First" policy, the most successful approach will be evolutionary, enabling IT leaders to

- Maintain service-level agreements (SLAs).
- Keep data and applications secure and available.
- Protect privacy and classified information.
- Support the proliferation of end-user devices.
- Contain costs.

When agencies begin their journey to the cloud with virtualization—an IT transformation starting point that preserves existing investments—they realize significant agility, cost and security benefits.

## **A Vision of the Future**

The VMware® vision for cloud computing in the Federal government focuses on enabling agencies to adopt cloud while preserving existing investments. With virtualization as the foundation, agencies can build cloud architectures that are flexible enough to support a unified private and hybrid cloud model.



## CLOUD SERVICE MODELS

### Private cloud

Operated solely for an organization, usually onsite (internal). Often favored, because it is easier to control and entails lower risk.

### Public cloud

Made available to the general public or a large industry group and is owned by an organization selling cloud services.

### Hybrid cloud

Composed of two or more cloud models that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability.

### Community cloud

Shared by several organizations and supports a specific community that has like concerns.

Today, the Federal government operates and maintains approximately 2,100 datacenters, with a mandate to reduce that number by 800 by 2015. With virtualization, this goal is achievable, especially because fewer than 15 percent of Federal x86 servers are currently virtualized, according to recent estimates. If agencies undertook a simple 2:1 server consolidation effort, they could presumably reduce the number of physical x86 servers by half and achieve significant cost savings for this basic effort. Their savings potential, however, is much greater, considering that VMware customers achieve average consolidation ratios of 12:1, with many attaining much higher rates.

Imagine operating fewer datacenters but having greater agility, control and choice while reducing complexity and the \$35.7B spent annually supporting legacy applications.<sup>1</sup> In a virtualized datacenter, disaster recovery and continuity of operations (COOP) are easier, and they do not require multiple layers of duplicate infrastructure. Use of hosted desktops as a service to deliver applications and information enables personnel to access work securely during snowstorms or when family members require care at home. Think about teleworkers securely accessing applications and data remotely so they can stay productive, while the IT organization maintains the security and control it needs to manage agency infrastructure and data. With virtualization, these benefits have gone from imagined to real for many Federal agencies.

Virtualization is the foundation of cloud computing because it removes the dependencies between the software and the hardware that runs it. Agencies are no longer restricted to the traditional inefficient ratio of 1:1:1 for servers, operating systems and applications. This decoupling enables IT to turn underutilized infrastructure into an elastic, resilient, partitioned and secure pool of compute resources available to users on demand.

In the most recent Gartner, Inc. Magic Quadrant for x86 Server Virtualization Infrastructure, VMware was placed in the leaders quadrant.<sup>2</sup> As an industry leader in virtualization, VMware is delivering a vision that is defining the new era of cloud computing.

# Evolutionary Approach to Your Cloud

With VMware, Federal agencies can embark on an evolutionary path to cloud computing to build the most important cloud—your cloud. Our approach, which begins with virtualization, allows agencies to transform server, storage and networking resources into secure, efficient resource pools to enable IT as a service. We support private, hybrid or public cloud infrastructure to deliver agility, security, flexibility and cost savings. The flexibility VMware provides gives Federal agencies the freedom to work with hardware and software vendors of their choice. Plus our solutions can manage physical, virtual and cloud infrastructure from a single management console, allowing agencies to monitor and manage the health of virtual, cloud-based and physical infrastructure.

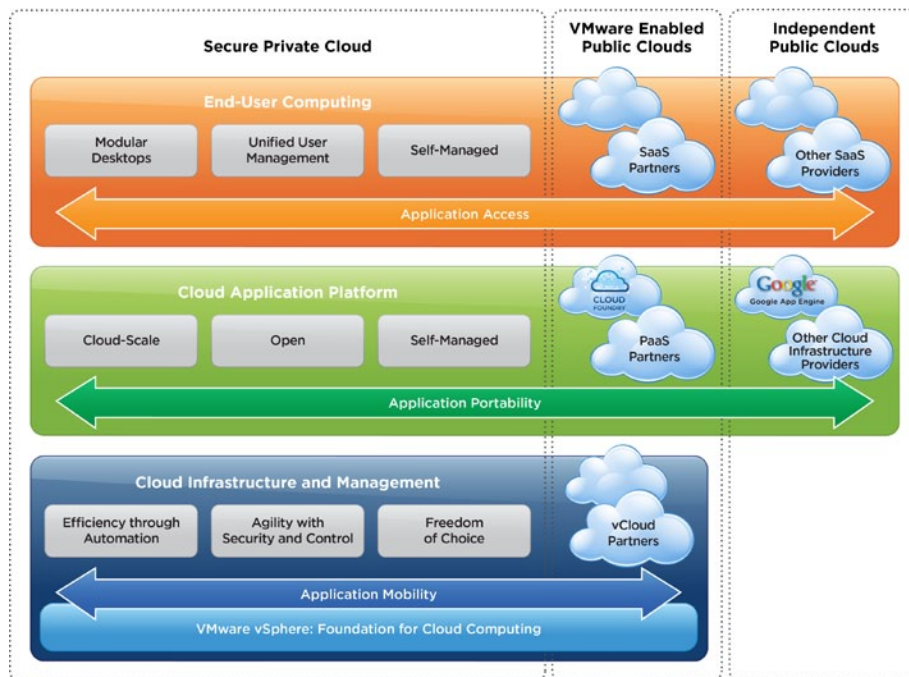
VMware offers three complementary on-ramps to begin your agency’s journey to cloud computing: Cloud Infrastructure and Management, Cloud Application Platform and End-User Computing. Agencies can pursue initiatives in these areas in any order or simultaneously; however, most of our customers start their journey at the infrastructure layer. Along the way, agencies will experience value and benefits at every step in their

## Agility

“Done well, server virtualization makes fundamental changes that can lead an organization down the path to private and public cloud computing.”

Thomas Bittman  
VP and Distinguished Analyst at Gartner

### VMware Solutions for Your Cloud



**Figure 1:** VMware delivers customer-proven cloud infrastructure and management, cloud application platform, and end-user computing solutions.

## NAVY/MARINE CORPS INTRANET

Consolidated 6,000 networks

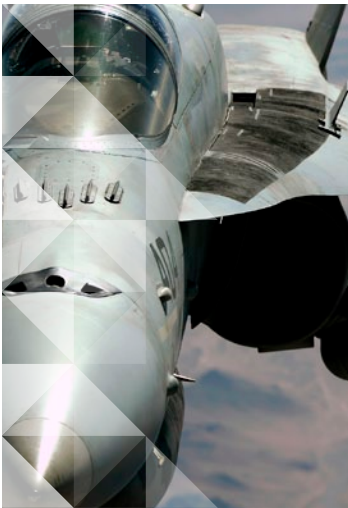
9:1 server consolidation ratio

\$1.5M annual savings on power and cooling costs

40–70% savings on datacenter floor space

Reduced Navy's carbon emissions by 6,500 tons

Virtualization program contributed to USN winning InfoWorld Green15 award in 2009



transformation journey. The goal of the VMware approach to cloud computing is to accelerate the value of your agency's IT, which in turn accelerates government's ability to deliver its mission for its citizens.

## Cloud Infrastructure and Management

Over the years, Federal agencies have added servers and datacenters to meet the constant demand for new services and applications. Consequently, agencies are now dealing with growing server sprawl and IT complexity, which has brought with it higher costs, decreased ROI, decreased manageability and reduced efficiency. With virtualization, which removes software and hardware dependences, Federal IT leaders can increase agility while dramatically reducing capital and operational expenses.

For example, Federal agencies have used VMware solutions to reduce datacenter and capital costs by as much as 60 percent, decrease time spent on routine administrative tasks by about a third and cut datacenter energy costs by up to 80 percent—all without sacrificing compute performance.

VMware cloud infrastructure and management solutions enable Federal agencies to

- Virtualize business-critical applications to deliver IT services more effectively without compromising on performance.
- Increase the control and security of IT infrastructure with automated operations, business continuity and disaster recovery, and compliance.
- Bring IT agility by leveraging existing investments while bridging to the cloud deployment model of choice.

## VMware Solutions Deliver Security, Performance and Control

VMware solutions extend the useful life of existing agency IT investments for both IT production applications (e.g., file and print servers) and business-critical applications. By virtualizing critical applications, agencies can accelerate application delivery. They can improve quality of service through dynamic scaling and high availability, as well as enable disaster recovery. With VMware solutions, agencies can run critical business applications with higher reliability, at lower cost.

VMware virtualization and cloud management allow Federal agencies to be both proactive and reactive when it comes to changes in their infrastructure. Our management solutions automate operations, including change management, capacity planning, COOP and disaster recovery. With comprehensive visibility through a single dashboard, Federal IT can intelligently pinpoint, analyze and prevent potential performance issues in real time, before they affect end users. They also continuously monitor IT assets to enhance security, governance and compliance. With VMware virtualization and cloud management, agencies can better manage the life cycle of their datacenter infrastructure.

Through enterprise hybrid cloud, VMware gives agencies the security, performance and control of a private cloud with the economies of scale and agility of the public cloud. We

support application portability between private and public clouds by working closely with service providers to leverage our secure and managed infrastructure platform. In fact, all five of the cloud service providers placed in the leaders quadrant in the most recent Gartner, Inc. Magic Quadrant for Cloud Infrastructure as a Service and Web Hosting<sup>3</sup> are partially or wholly VMware based. A VMware enabled hybrid cloud provides freedom of choice. Agencies can work with preferred service providers and move in and out of a public cloud according to their needs—without vendor lock-in. With our open and evolutionary approach, agencies can minimize both risk and IT disruptions.

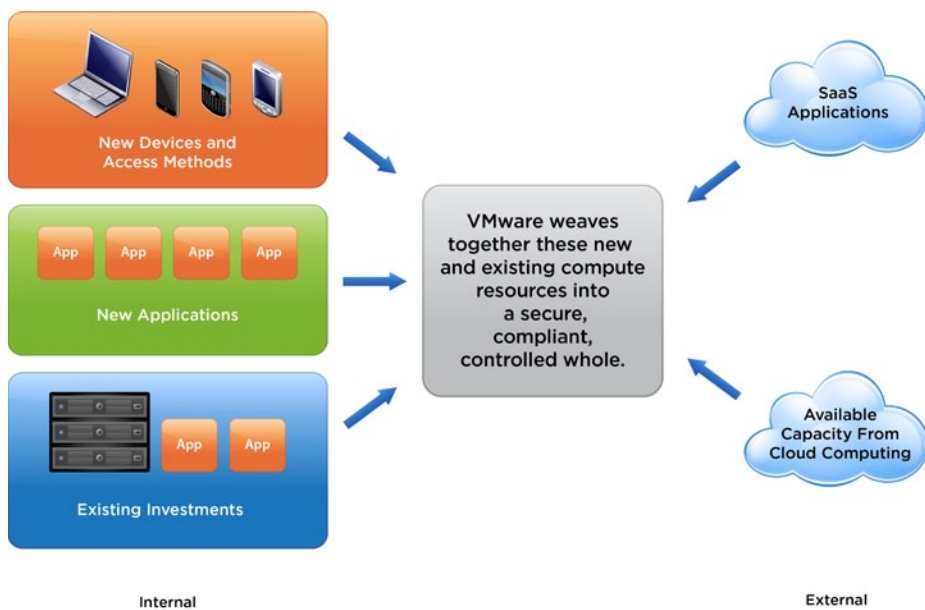
### Cloud Application Platform

Like the Internet, cloud computing is transforming application development. As agencies move to the cloud, they are considering how to most effectively transition and deliver legacy applications and how to deliver new cloud-ready applications to realize the full benefits of cloud computing.

The VMware cloud application platform enables Federal agencies to

- Modernize legacy applications for the cloud.
- Deliver new, cloud-ready applications that are optimized to run on virtual infrastructure.
- Increase the reliability, availability and scalability of applications.
- Enhance application portability between clouds.
- Manage, monitor and optimize application performance.

### VMware Delivers Comprehensive Solutions that Enable Your Cloud



**Figure 2:** VMware offers a pragmatic approach to your cloud that transforms the datacenter, application development and end-user computing.

### U.S. HOUSE OF REPRESENTATIVES OFFICE OF THE CHIEF ADMINISTRATIVE OFFICER

Consolidated 450 servers to fewer than 100

Reduced power consumption by 45%

Improved resource utilization

## Flexible

Eighty-two percent of government IT leaders are currently using and plan to use either a private or hybrid cloud model.<sup>4</sup>

# Trusted

VMware Federal government clients include all Cabinet-level agencies; U.S. Department of Defense and all military branches, services and joint commands; legislative branch; judicial branch; and many independent and quasi-governmental agencies.



For example, VMware solutions can enable faster and easier access to data and applications, even on disadvantaged or intermittently connected networks, to enhance situational awareness and improve decision making for military, first-responder and law-enforcement teams. In both man-made and natural disasters, providing immediate access to the right information translates into lives saved and faster recovery times.

With application virtualization, agencies can significantly reduce space and power consumption by running twice as many applications on fewer computers using less electricity. These benefits are especially important to agencies with international locations (e.g., U.S. embassies) where additional space and power-consumption requests require approval from the host countries.

## End-User Computing

The blizzards of 2010 crippled the Washington, D.C. region, closed government offices for four days, cost millions of dollars and provided the ideal use case to expedite the enactment of the Telework Enhancement Act of 2010.

The Telework Act and initiatives relating to disaster recovery and COOP pose opportunities and challenges for Federal IT leaders, as users now expect and require access to applications and data on a variety of devices. Yet IT must secure information and control critical processes and data.

Telework and COOP planning are just two examples of how VMware end-user computing solutions can be used to

- Provide personnel with immediate and flexible access to applications and data any time, anywhere.
- Reduce the cost and complexity of desktop management.
- Support a wide variety of end-user devices, such as thin and zero clients, smartphones and tablets.
- Give IT organizations the control they need to ensure agency security and compliance.
- Transition from traditional email to next-generation email and collaboration software.

VMware end-user computing solutions enable and empower IT to manage desktops as a cloud-based service. Agencies can quickly provision, deploy, and keep sensitive data secure and protected, by centrally storing desktop images and data on servers behind agency firewalls, eliminating the risk of security breaches due to laptop theft or data loss. Personnel can securely access familiar resources through government-furnished equipment or their own PCs. Additionally, VMware solutions simplify application delivery by enabling IT to easily deploy, manage and update applications independently from the operating system. Agencies have already used VMware end-user computing solutions to save up to 45 percent on desktop costs, increase user satisfaction and improve COOP.

# Providing Security and a Proven Path

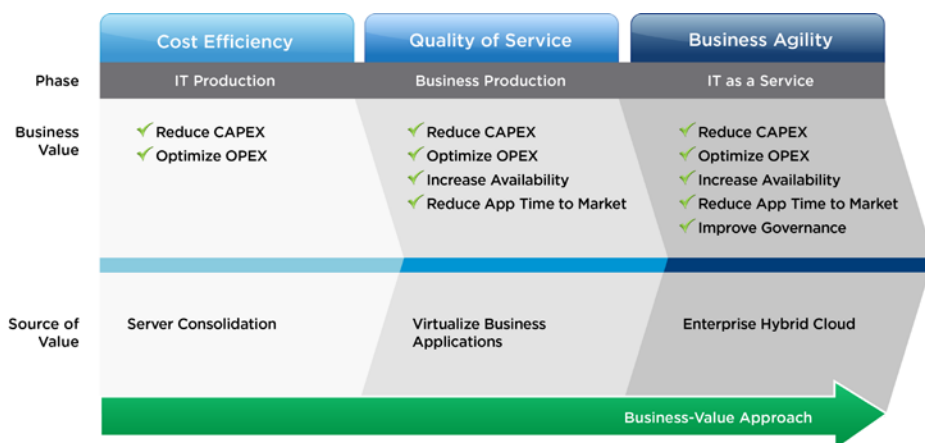
VMware offers a pragmatic, value-added path that helps agencies adopt cloud securely. VMware delivers infrastructure and cloud security in multiple ways. Virtual infrastructure is inherently more secure and stable than traditional physical infrastructure because it reduces the attack profile of the enterprise, and it is easier to isolate breaches or contaminated infrastructure. In virtual infrastructure, virtual machines are partitioned, or isolated, from one another, providing assurance that if one machine fails the others are unaffected.

VMware has also delivered significant security innovations to provide an additional layer of protection for more-sophisticated virtual environments. With VMware solutions, agencies have a single comprehensive framework for securing virtual datacenters and cloud environments at all levels—host, network, application, data and endpoint. With VMware security solutions, agencies can centralize security across the virtual datacenter, secure the edge of the virtual datacenter, protect applications from network-based threats, and offload antivirus and antimalware processing for endpoints.

## Value Along the Way

VMware helps Federal agencies transition to cloud computing in three phases: from IT Production to Business Production to IT as a Service. Agencies will experience significant benefits during each phase of the journey, rather than having to wait until all phases are completed.

### The Journey to Your Cloud



**Figure 3:** VMware offers a practical, three-phase journey to IT as a Service for organizations transitioning to a cloud computing approach.

# Secure

Understanding that security is the top concern for Federal IT leaders, VMware has taken steps to certify its solutions so that agencies can be confident in their VMware investments. VMware has achieved, or is in process for, a number of certifications and validations on its various products, including Common Criteria EAL 4+ Certification, Defense Information Systems Agency (DISA) Security Technical Implementation Guide (STIG) and Federal Information Processing Standard (FIPS) validation.



## Proven

The VMware ecosystem includes more than 25,000 technology partners and 3,500 service provider partners delivering compatible, high-value solutions.

## Only VMware Delivers Your Cloud

More Federal IT infrastructure is virtualized on VMware than any other platform. In fact, VMware virtualization solutions are run by all 15 executive branch agencies; by all Department of Defense agencies, services and joint commands; and throughout both the legislative and judicial branches.

In these agencies, virtualization and cloud computing are enabling significant benefits, including cost savings, greater agility, increased efficiency, faster application development and deployment, decreased power and energy consumption, increased space savings and more.

VMware introduced x86 server virtualization, the foundation for cloud computing, to the world in 1998. Now, VMware is the global leader in virtualization and cloud infrastructure.

Dramatically reducing IT complexity is the VMware mission, and our award-winning solutions have transformed IT for more than 250,000 customers in the commercial and government sectors for more than a decade. VMware solutions are complete and completely flexible, so you can build the most important cloud in the world.

**Your Cloud.** Accelerate IT. Accelerate Your Mission.

1 MeriTalk. "Federal Application Modernization Road Trip: Express Lane or Detour Ahead?" Survey. Jan. 2011.

2 Bittman, Thomas J., Dawson, Philip, and Weiss, George J. "Magic Quadrant for x86 Server Virtualization Infrastructure." Gartner, May 2010.

3 Leong, Lydia and Chamberlin, Ted. "Magic Quadrant for Cloud Infrastructure as a Service and Web Hosting." Gartner, Dec. 2010.

4 MeriTalk. "Federal Cloud Weather Report." Survey. Mar. 2011.

## **Purchasing**

VMware solutions are available across a wide range of Federal Governmentwide Acquisition Contracts (GWACs), Indefinite Delivery/Indefinite Quantity (IDIQs) and Blanket Purchase Agreements (BPAs), including:

- General Services Administration (GSA)
- Energy Smart Industrial (ESI) BPA
- SmartBuy
- NASA Solutions for Enterprise-Wide Procurement (SEWP)
- Apps.gov

## **Learn more**

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