Optimizing the Data Center for Today’s Federal Government

Who should read this paper
CIOs, CISOs, IT Managers
WHITE PAPER: OPTIMIZING THE DATA CENTER FOR TODAY’S FEDERAL GOVERNMENT

Optimizing the Data Center for Today’s Federal Government

Content

Executive Summary ................................................................. 1
Requirements for Data Center Optimization in the Federal Government ........................................ 1
Core Principles of Data Center Optimization in the Federal Government ..................................... 2
A Proven Methodology for Data Center Transformation ................................................................. 3
Technology Solutions for Data Center Transformation ................................................................. 5
Summary .................................................................................. 7
Appendix: Symantec Data Center Optimization Solution Matrix .................................................. 7
Executive Summary

Faced with mandates, budgetary pressures, and mounting IT complexity, the federal government has launched a government-wide data center consolidation initiative. While data center initiatives can present change and sometimes significant risk, studies have shown that the potential for cost savings as a result of successful data center optimization efforts is in the billions of dollars.

There are several core principles fundamental to successful strategic data center optimization. Among them, storage optimization, ensuring 24x7 availability, accelerating virtualization, and cloud adoption and maximizing agility. To minimize risk, capture the cost savings, simplify IT complexity, and comply with mandates, government organizations need an approach that combines best practices with complementary technologies that address these core principles.

This whitepaper provides an overview of key drivers for data center optimization in the federal government, describes the core principles associated with data center optimization, and details best practices, methodologies, and technology solutions proven to derive maximum value from data center optimization initiatives.

Requirements for Data Center Optimization in the Federal Government

The federal government’s long-term data center consolidation efforts are well underway. Launched in February 2010 by the Office of Management and Budget (OMB), the Federal Data Center Consolidation Initiative (FDCCI) outlined guidance and a series of deadlines to assist agencies in identifying their existing data center assets and formulating consolidation plans to reduce the number of federal data centers by 40 percent, or 800, by 2015. In the near term, agencies and departments must adopt a zero-growth strategy for data center space and then begin reduction.

Aiming to reduce the overall energy and real estate footprint of government data centers; cut the cost of data center hardware, software and operations; and, shift IT investments to more efficient computing platforms and technologies, the FDCCI has far ranging implications for other federal initiatives and mandates.

For example, as agencies embrace the FDCCI, the benefits will, in turn, help address Green IT mandates such as the Energy Independence and Security Act of 2007 (EISA 2007), Executive Orders 13423 and 13514 and the Environmental Protection Agency (EPA) ENERGY STAR Data Center Energy Efficiency Initiatives. These mandates share a goal of improving efficiencies and reducing energy consumption with the latter specifically targeted at efficiencies in the data center. A 2007 report to Congress by the EPA ENERGY STAR Program estimated that federal servers and data centers consumed over 6.1 billion kilowatt-hours (kWh) in 2006 and could double by 2011 without a shift in technology deployment.

In addition, the FDCCI is helping to spur the administration’s support of cloud computing. The federal government’s “Cloud First” policy states that the OMB will require that agencies default to cloud-based solutions whenever a secure, reliable, cost-effective cloud option exists. Each agency CIO is required to identify three “must move” services and fully migrate these services to a cloud solution over the next 12 to 18 months (by mid-2012). According to the Federal Cloud Computing Strategy, the federal government’s current Information Technology (IT) environment is characterized by low asset utilization, a fragmented demand for resources, duplicative systems, environments which are difficult to manage, and long procurement lead times. These inefficiencies negatively impact the federal government’s ability to serve the

2-Report to Congress on Server and Data Center Energy Efficiency Public Law 109-431, U.S. Environmental Protection Agency ENERGY STAR Program, August 2, 2007, Pg25
3-Federal Cloud Computing Strategy, February 8, 2011, The White House, Pg 1
American public. An estimated $20 billion of the federal government’s $80 billion in IT spending is the potential target for migration to cloud computing solutions.

As is often the case, agencies and departments must satisfy all of these mandates and guidelines against a backdrop of “doing more with less.” Budgetary pressures make it particularly challenging to adopt new technologies and best practices required to optimize the data center. However, according to an April 2011 study by MeriTalk, *Federal Data Center Consolidation: Measure to Manage Report*, these very technologies and processes could save federal agencies as much as $18.8 billion a year.

**Core Principles of Data Center Optimization in the Federal Government**

In order to capture the billions of dollars in cost savings and comply with government mandates, federal agencies and departments should consider pursuing data center optimization initiatives with a focus on four main principles.

1) **Optimize Storage**

The growing volumes of data that need to be stored, managed, and moved are taxing government infrastructures. A moratorium on expanding data center space and a need to save costs are forcing agencies to find alternatives to storage build out. Poor visibility to actual storage consumption and the inability to reclaim wasted storage leads to unnecessary purchases, which puts increasing pressure on IT budgets. Identifying strategies to increase utilization of existing storage and rolling out to thin provisioning are a priority. Federal data centers should consider taking steps to deploy solutions that can aid in centralizing visibility and control across physical and virtual environments, gain higher efficiency from existing storage, identify and capitalize on wasted storage, and automatically and continuously reclaim and optimize storage.

2) **Ensure 24x7 Availability**

Resiliency through a crisis situation is critical. Continuous and heightened threats due to natural and man-made disasters put national infrastructure and citizens at risk. Ensuring continuity of Government and 24x7 availability of systems are essential to national security. Downtime caused by human error and complexity of systems, lack of support for high availability and disaster recovery solutions in heterogeneous environments, cost of these operations and deployments, and difficulties associated with planning and testing without disrupting service are making it difficult to ensure 24x7 availability. Agencies and departments are demanding more stringent service level agreements from vendors and are seeking strategies for streamlined disaster recovery build out and testing. Government agencies should apply best practices and solutions that accelerate application and data failover, provide automated support for high-availability, disaster recovery and backups, and eliminate unplanned downtime.
3) **Accelerate Virtualization and Cloud Adoption**

The benefits of virtualization—cutting costs, increasing flexibility and saving energy—have been widely touted. As a stepping stone to cloud adoption, virtualization is gaining traction within government data center consolidation plans. However, the Symantec 2011 Virtualization and Evolution to the Cloud Survey found that concerns related to disaster recovery and the ability to maintain security and control over mission-critical data and applications are slowing adoption of virtualized/cloud environments. Identifying strategies to improve security of the data center and storage performance in virtual machines (VMs), automate application recovery in VMs, and improve data governance through insights into unstructured data, are essential to confidently integrate virtualization and the cloud into data center optimization strategies. Federal data centers should ensure that the following needs are met through a combination of processes and solutions that:

1. Centralize visibility and control across virtual and physical assets
2. Enforce security, backup and storage policies on VMs
3. Protect mission-critical data
4. Automate recovery across virtual and physical environments
5. Increase utilization and reclaim storage
6. Virtualize pooled storage and leverage dynamic tiering

4) **Maximize Agility**

Heterogeneous infrastructure leads to a proliferation of disparate tools, manual processes, and a lack of visibility. Effective data center transformation requires the ability to manage change and increasing complexity more efficiently and quickly. Remaining agile in the face of operational complexity, manually intensive infrastructure projects, and an increased risk of unplanned downtime is a challenge. Identifying ways in which to enable agility through consolidation, visibility, automation, and standardization across the data center are essential. Government should consider applying practices and solutions that offer centralized control over IT infrastructure, reduce complexity through automation, proactively identify risks, simplify maintenance, provide end-to-end visibility, and support cross-team collaboration to minimize disruptions during migration.

Optimizing the data center based on these core principles requires a combination of proven methodologies to minimize risk and costs and complementary technologies that can be leveraged across multiple, heterogeneous environments.

**A Proven Methodology for Data Center Transformation**

Data center optimization is often regarded as one of the highest risk projects that IT can undertake. Federal agencies and departments need to identify partners with proven methodologies and a wealth of experience in minimizing risk and successfully transforming the data center on time and within budget.

Symantec brings to every engagement a unique Data Center Transformation (DCT) solution framework, enabling cumulative benefits from a wide range of enterprise services and technologies. The DCT framework is comprehensive yet pragmatic, focused on addressing current priority challenges in IT while delivering sustainable improvement across and organization’s data center environment—from core infrastructure (servers and storage), through operation and administration, to ownership and management.
Symantec consultants apply a phased approach to the DCT process as indicated above. DCT is not a short-term fix but a strategic and holistic process that includes comprehensive assessments, architectural best practices and innovative product enablement services. Using this framework, Symantec consultants take many interrelated technologies and processes into consideration and optimize them in a manner that yields dramatic improvements in the overall IT ability to manage cost, complexity and performance.

The DCT process consists of best practices in discovery, planning and implementation.

**Discovery.** The process begins with a Project Definition Workshop to ensure all parties clearly understand the scope of the project. This is followed by an asset inventory, assessment of the current and desired future state of the architecture, as well as identification of methodologies that will be used and schedules and budgets that will be adhered to. Symantec has refined this phase based on auditing, profiling, and migrating over tens of thousands of servers and has developed processes and a collaborative toolset to facilitate the transition and reduce risk.

**Planning.** Diligent preparation during the planning process ensures application availability requirements are met and provides clarity of impacts and dependencies. Symantec provides all aspects of the planning and pilot phase, from the development of the migration scheduling process and the schedule itself, to the design and validation of the migration processes. Using a Migration Lifecycle process based on interrelated ‘elements’ Symantec achieves data center optimization in a controlled, consistent, and standard manner with minimum downtime and disruption. A pilot phase further minimizes risk by migrating a controlled number of systems and updating procedures as needed.

**Implementation.** Leveraging a repeatable process, implementation follows eight steps based on work completed in the planning phase. These steps include:

1. Confirm migration with the server/application owner
2. Analyze risk involved
3. Create a plan for the actual preparation and migration
4. Prepare the migration
5. Perform backup
6. Perform the migration
7. Test and back-out if necessary
8. Handover to support

Symantec and the client teams conclude the engagement with formal review meetings, documentation and agreed next steps. Putting systems in place for ongoing tracking and reporting and to identify and manage service improvement plans ensure ongoing success.

Technology Solutions for Data Center Transformation

The Symantec Data Center Transformation methodology may be coupled with a range of Symantec software solutions that come into play depending on the specific data center principles a federal agency or department is focused on.

Optimize Storage: Symantec is helping government clients optimize storage with solutions that reduce acquisition costs, increase utilization and leverage thin provisioning. Using Symantec storage optimization solutions allow clients to:

- Centralize visibility and control of heterogeneous servers, storage, databases, and applications across both physical and virtual environments.
- Use storage more efficiently since it is not consumed at the time of provisioning, but rather at the time that applications write data.
- Discover wasted storage and reclaim unused storage into a shared storage pool, thereby increasing storage utilization, and reducing storage hardware and operational expenses.
- Transparently reclaim all unused storage by enabling automated reclamation during migrations and continuous storage optimization on thin provisioning-enabled hardware.

Symantec data center optimization experts work with clients to recommend specific products from a range of offerings. Symantec offers solutions that offer comprehensive visibility and control over data center assets, support for thin provisioning enabled hardware, and automatic reclamation during migrations and continuous storage reclamation. See Appendix A.

Ensure 24x7 Availability: High availability and disaster recovery (HA/DR) solutions from Symantec help clients achieve their goals to reduce complexity, prevent downtime and accelerate recovery. Using these solutions allow clients to:

- Ensure the highest levels of data protection for mission-critical workloads.
- Provide visibility and orchestrate availability for a complete business service that may be composed of different applications and databases running on heterogeneous operating systems and virtualization technologies.
- Achieve cost-effective, automated and accelerated application and data failover across any distance on any major platform or storage array.
- Reduce complexity with out-of-the-box HA/DR support for all major platforms, applications, databases and replication technologies.
- Protect against unplanned downtime with HA/DR testing.
Symantec consultants and client teams work together to identify the best solutions from a range of products. Symantec is uniquely positioned with HA/DR solutions that offer the widest and deepest support for heterogeneous platforms, reducing or eliminating vendor lock-in. Additionally, Symantec provides centralized management of all clusters across the enterprise, campus cluster support, and comprehensive, non-disruptive HA/DR testing capabilities. See Appendix A.

**Accelerate Virtualization and Cloud Adoption:** Symantec virtualization management solutions help clients increase application awareness across virtualized environments, optimize VMs and confidently transition to cloud environments. With these solutions clients can:

- Instrument the virtual data center and automatically update service-level processes in response to dynamic changes in resource allocation.
- Automate the discovery of VMs and enforce existing security, backup, and storage allocation policies.
- Ensure continuity of government by automating application recovery and failovers across virtual and physical environments.
- Virtualize pooled storage and leverage dynamic tiering and provisioning across heterogeneous arrays.

Symantec consultants work with clients to identify the right solutions from a range of products. Symantec offers the broadest and deepest range of solutions that work seamlessly across physical and virtual environments to centralize and standardize management of assets, as well as provide global visibility, ensure mission critical data protection, support application-level recovery, and test disaster recovery plans without impacting availability. See Appendix A.

**Maximize Agility:** Symantec helps federal agencies and departments maximize agility with solutions that centralize management, automation operations and support non-disruptive change. Using these solutions clients can:

- Centralize control of storage and server infrastructure.
- Automate operations and complex tasks for storage, HA/DR and multi-pathing.
- Identify risks and issues across the infrastructure with operational reporting.
- Simplify maintenance and installation processes.
- Gain end-to-end visibility of storage, server, and application environments.
- Bridge the gap between the server, storage, and applications teams by enabling these teams to identify dependencies and minimize disruptions during migration.

Working with clients, Symantec consultants recommend the most appropriate products from a range of offerings. Symantec offers solutions that can work across all hardware platforms, manage storage resources, and availability configurations through a single tool, offer comprehensive visibility of heterogeneous hardware assets, and provide easy to install and use risk management capabilities.
Summary
Federal agencies and departments are at a critical juncture with their IT infrastructures. Government mandates and the potential for billions of dollars in cost savings are driving data center consolidation initiatives, yet data center optimization is often regarded as one of the highest risk projects that IT can undertake.

Symantec Delivers High-Value Results

- 18% reduction of Direct Attached Storage Device (DASD) resources
- 20% reduction in application estate
- Facilitate migration governance
- Mitigate risk to 1000s of applications

Four core principles have emerged for successful strategic data center optimization—storage optimization, ensuring 24x7 availability, accelerating virtualization and cloud adoption, and maximizing agility.

Symantec has developed a strategic approach to address these core principles that combines a proven methodology in data center optimization with a portfolio of industry-leading solutions. With more than ten years of success working with government clients, Symantec has a deep understanding of the challenges of federal data center optimization and demonstrated results that minimize risk, capture the cost savings, simplify IT complexity, and comply with mandates.

Appendix: Symantec Data Center Optimization Solution Matrix

The table below maps Symantec product offerings to key federal data center optimization principles.
<table>
<thead>
<tr>
<th>Products/Principle</th>
<th>Optimize Storage</th>
<th>Ensure 24x7 Availability</th>
<th>Accelerate Virtualization and Cloud Adoption</th>
<th>Maximize Agility</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veritas™ Operations Manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Operations Manager is the complete management platform to optimize data center assets using the Storage Foundation and Veritas™ Cluster Server software. It improves management of data center assets by providing solutions to centralize visibility and control, ensure availability, scale operations, optimize storage, and maintain compliance.</td>
</tr>
<tr>
<td>Veritas Storage Foundation™ from Symantec</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Storage Foundation provides a complete solution for heterogeneous online storage management. Based on the industry-leading Veritas™ Volume Manager from Symantec and Veritas™ File System from Symantec, it provides a standard set of integrated tools to centrally manage explosive data growth, maximize storage hardware investments, provide data protection, and adapt to changing requirements.</td>
</tr>
<tr>
<td>Veritas Disaster Recovery Advisor</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>Disaster Recovery Advisor monitors high-availability (HA) and disaster recovery (DR) configurations to ensure data center recoverability. By scanning systems across the data center to ensure existing HA/DR plans are applied seamlessly, Disaster Recovery Advisor helps to limit the risk of infrastructure and application downtime. With a list of thousands of host and storage vulnerabilities and critical issues that might prevent a data center from recovering from an outage. Disaster Recovery Advisor does not require agents. As a result, it provides a quick recovery, simple installation and maintenance, as well as an intuitive Web interface for ease of use.</td>
</tr>
<tr>
<td>Symantec™ Data Insight for Storage</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Data Insight for Storage helps solve the data protection problem for unstructured data by providing insight into usage patterns and access permissions. Data Insight is part of a complete Symantec™ Data Loss Prevention storage solution that also includes Network Discover and Network Protect.</td>
</tr>
<tr>
<td>Symantec™ FileStore N8300</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>FileStore N8300 is a high-performance, integrated clustered network attached storage (NAS) solution that provides an all-in-one information service platform for all file-serving requirements.</td>
</tr>
<tr>
<td>Veritas™ Operations Manager Advanced</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Operations Manager Advanced is a comprehensive discovery and reporting platform that helps you gain visibility of storage usage and maintain high storage utilization across multiple data centers, providing an enterprise view. It is a premium offering on top of Veritas Operations Manager and encompasses Storage Foundation and Cluster Server environments to discover native OS environments as well.</td>
</tr>
<tr>
<td>Veritas™ Cluster Server from Symantec</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Cluster Server is the industry’s leading clustering solution for reducing planned and unplanned downtime of mission-critical applications. It can detect faults in an application and all its dependent components, including the associated database, operating system, network, and storage resources. When a failure is detected, Cluster Server shuts down the application, restarts it on an available server, connects it to the appropriate storage device, and resumes normal operations.</td>
</tr>
<tr>
<td>Products/Principle</td>
<td>Optimize Storage</td>
<td>Ensure 24x7 Availability</td>
<td>Accelerate Virtualization and Cloud Adoption</td>
<td>Maximize Agility</td>
<td>Benefits</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>--------------------------</td>
<td>---------------------------------------------</td>
<td>------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Symantec™ ApplicationHA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ApplicationHA is based on the industry-leading Veritas Cluster Server technology and provides application availability in coordination with VMware High Availability. Together, Symantec and VMware work to help organizations move mission-critical applications into VMware virtual machines and reduce downtime of these applications inside the virtual environment. ApplicationHA customizes application start/stop behavior inside the virtual machine, monitors application health status, detects application failures, restarts applications, and, if needed, triggers VMware HA for virtual machine restart.</td>
</tr>
<tr>
<td>Symantec™ VirtualStore</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>VirtualStore is a highly scalable, clustered NAS solution for VMware virtual machine management. Based on the industry-leading Veritas Storage Foundation™ Cluster File System from Symantec, VirtualStore solves the storage challenges of virtual infrastructures with rapid provisioning of servers and virtual desktops as well as efficient cloning and boot-up of virtual machines, all through VMware’s management console, vCenter.</td>
</tr>
<tr>
<td>Symantec NetBackup™</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>The NetBackup platform simplifies the protection of information-driven organizations by automating advanced technologies and standardizing operations across applications, platforms, and virtual environments. Integrated deduplication, replication, and patent-pending virtual machine protection helps organizations improve storage efficiency, infrastructure use, and recovery times through one console.</td>
</tr>
<tr>
<td>Symantec Backup Exec™</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Backup Exec™ 2010 delivers reliable backup and recovery. Easily protect more data while reducing storage and management costs, and improve overall backup performance through integrated deduplication (using Symantec NetBackup PureDisk™ technology) and archiving technology (powered by Symantec Enterprise Vault™).</td>
</tr>
<tr>
<td>Symantec™ System Recovery Server Edition</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Symantec™ System Recovery 2011 delivers fast and reliable system recovery to help minimize downtime and meet recovery time objectives with confidence. Quickly restore physical and virtual systems in minutes, even to bare metal, dissimilar hardware, remote locations, or virtual environments through Symantec’s patented Restore Anywhere technology.</td>
</tr>
<tr>
<td>Symantec™ Control Compliance Suite</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>Control Compliance Suite is designed to address IT risk and compliance challenges by delivering greater visibility and control across infrastructure, data, and people. This fully automated solution allows organizations to effectively manage security risks while reducing the cost and complexity of compliance.</td>
</tr>
<tr>
<td>Symantec™ Endpoint Protection</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Endpoint Protection offers advanced defense against all types of attacks for both physical and virtual systems. The solution seamlessly integrates the essential security tools needed into a single, high-performance agent with a single management console.</td>
</tr>
<tr>
<td>Symantec™ Workspace Virtualization</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Workspace Virtualization virtualizes applications in workspace environments, eliminating application conflicts, reducing testing requirements and support calls, and providing instant reset for broken applications.</td>
</tr>
</tbody>
</table>
About Symantec

Symantec is a global leader in providing security, storage, and systems management solutions to help consumers and organizations secure and manage their information-driven world. Our software and services protect against more risks at more points, more completely and efficiently, enabling confidence wherever information is used or stored. Headquartered in Mountain View, Calif., Symantec has operations in 40 countries. More information is available at www.symantec.com.