



The smart money's on IT

How the
Efficient Data Center
drives sustainable
growth

By Bryan Jones and Bill Goins



Imagine a data center where **pooled** servers, networking, and storage can be rapidly redeployed to meet changing needs; where business application developers can **self-provision** their workload deployments; and where optimized storage and intelligent infrastructure are the norm. Dell is helping organizations to unlock data center efficiency and work toward the goal of returning as much as **50 percent of the IT budget to drive business innovation.**

Today, efficiency is a basic tenet of business survival. The boardroom IT conversation is no longer restricted to cutting costs—it's about investing in technology to efficiently drive business and organizational success.

Although IT supports virtually every business process, and tough economic times have led to intensified competition, many organizations are hard-pressed to take advantage of technology advances when they are trapped into spending most of a spartan IT budget on maintenance instead of innovation. As a result, nonstrategic tasks are occupying an increasing proportion of the workday in many data centers.

Virtualization and consolidation can go a long way toward driving data center efficiency, but they are just the beginning. Technologies for flexible data management, self-service workload creation and deployment, resource pooling, and smart, self-aware infrastructure help to simplify data center management and significantly lower total cost of ownership (TCO). In an environment where IT leaders are looking to partner with business units in a way that increases automation and productivity across the organization, advanced data center technologies can make these goals a reality.

Most technology vendors are focused on tackling the simplest of these challenges by virtualizing, consolidating, and automating the data center. These vendors typically propose a collection of proprietary offerings designed to lock organizations into vertically integrated, premium-priced infrastructures.

Dell offers a model for tackling these challenges and building a solid foundation for enterprise efficiency that does not lock organizations into proprietary solutions—a model that can optimize the existing data center, maintain choice in vendors and technology, and allow incremental implementation as time and budget allow. The Efficient Data Center is a key component of Dell's Efficient Enterprise model, purpose-built to lower costs and increase IT efficiency.



“Dell Advanced Infrastructure Manager software allows IT departments to manage networking, storage, and servers—both physical and virtual—as a single resource pool.”

Best practices: Envisioning the Efficient Data Center

In the Dell Efficient Enterprise vision, technology infrastructures are open, capable, and affordable. Products and services for the data center are flexible and avoid locking organizations into using a single vendor or proprietary technologies that contribute to increased TCO and limit future choice; products and services have innovative functionality that meets existing requirements and provides the flexibility to adapt to future requirements. In addition, Dell's vision blends new technology with existing infrastructure, existing expertise, and industry-standard approaches designed to drive down TCO and complexity.

Dell begins with a three-step approach to help organizations unlock enterprise efficiency and achieve significant returns on their IT investment. The first step on the journey is to optimize the existing data center infrastructure, with the goal of achieving uniformity and cutting costs. Common platforms, standards-based tools, and unified fabrics can contribute to these efforts. The goal: to eliminate proprietary legacy architectures, like RISC- and SPARC-based UNIX® systems, and replace them with a scaled x86 architecture running Microsoft® Windows® or Linux® operating systems to help lower costs and reduce management oversight.

The next step is to simplify the technology infrastructure. Using pragmatic approaches such as virtualization and storage consolidation, organizations can consolidate or unify redundancies to help ensure that they are getting the most out of their data center resources. Rationalizing and reducing the number of applications also enhances the flexibility to easily remove and repurpose servers.

After the data center has been standardized and simplified, enhanced levels of automation become possible. The third step is to implement best practices that help reduce manual intervention and boost productivity, together with cloud-based delivery models (where appropriate) that help reduce administrative burdens on IT staff and enhance application availability. Managed service options also allow organizations to combine 24/7 monitoring, alerts, and reporting with expert analysis and advice.

In the Dell model, the Efficient Data Center is built on four key pillars (see Figure 1).

Intelligent infrastructure

Dell's Efficient Data Center approach can help organizations optimize their existing data centers, virtualize on their own schedule, take advantage of cloud technologies as they make business sense—and prepare their data centers for the future.

Achieving these goals requires advanced servers, networking equipment, and storage. Intelligent infrastructure is designed to automate frequent tasks to drive down TCO, rapidly respond to change requests, and help administrators anticipate issues and proactively respond. Dell offers a range of infrastructure products to help meet these needs. Purpose-built hardware, like Dell™ PowerEdge™ C-Series servers optimized for cloud applications, can help administrators accomplish specific tasks. An efficient fabric helps lower costs and allows administrators to rack and cable only once. Cloud services enable applications to be cloud optimized. Intelligent infrastructure helps optimize the data center today and build the foundation for advanced Efficient Data Center services.



10GbE data center fabric

In this Webinar, learn how innovative technologies such as virtualization and 10GbE enable organizations to converge storage traffic onto a common unified data center fabric. The recorded presentation explores how integrating IT management, server, storage, and networking solutions can help accelerate 10GbE deployments—enhancing flexibility and performance while reducing cost and complexity.

eseminarslive.com/c/a/IT-Infrastructure/Dell041610

Dell gears its approach to enterprise efficiency toward taking advantage of the hardware and software already in the data center while also incorporating purpose-built hardware. With the right mix of blade servers, rack servers, towers, and custom form factors, IT departments can achieve optimum levels of compute density, memory, and I/O to help meet specific enterprise needs.

Dell PowerEdge servers are designed to support generalized workloads, hardware-based availability, and a traditional break/fix service model.

PowerEdge C-Series servers are standardized and purpose-built for cloud applications.¹ And Dell Data Center Solutions (DCS) are designed to support the largest public cloud providers in the industry with specialized workloads, application-based availability, and custom service models.

10 Gigabit Ethernet (10GbE) connectivity is rapidly becoming the industry standard for

networking in the data center. Enterprises can leverage this convergence to help reduce operating costs and avoid complexity while continuing to extract value from existing investments. Because the 10GbE standard allows organizations to continue using their existing platforms and networking tools, they can extend capital investments and IT staff training to the updated infrastructure. 10GbE bandwidth also allows the reduction of port count to help reduce cost, while a multi-vendor approach helps preserve choice in adopting new technologies as they become available.

Key Dell connectivity offerings include Dell PowerConnect™ switches, which provide Gigabit Ethernet (GbE) and 10GbE rack and blade switches that can deliver extreme price/performance targeted for edge network applications. Dell PowerConnect B-Series switches offer GbE and 10GbE rack and chassis switches for price-sensitive aggregation, core, and storage area network

Four pillars: Building the Efficient Data Center

Intelligent infrastructure: Deploys servers, networking, and fabrics that are designed and purpose-built to help reduce acquisition and operating costs, with the goals of reducing the number and types of devices to manage, racking and cabling once, taking advantage of the 10GbE convergence, and maintaining the flexibility of a multi-vendor approach

Simplified infrastructure management: Leverages technologies that enable IT staff to consolidate tools and pool resources, helping them to increase the operating efficiency of both new and existing infrastructures and to dynamically redeploy assets as conditions change

Streamlined application and workload management: Includes tools that allow rapid delivery of strategic IT services with the goals of enabling application developers to easily create images and self-provision their workload deployments, automating approval and deployment processes, and providing self-service cataloged services and chargebacks

Dell Intelligent Data Management: Optimizes content storage throughout its life cycle by automatically placing it on the appropriate tier and storage type while optimizing storage for virtualized environments

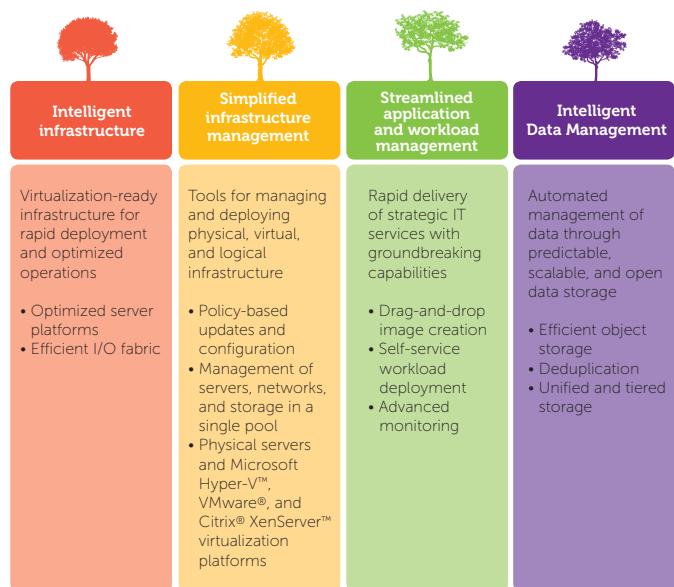


Figure 1. Four key pillars support the Dell model for building the Efficient Data Center

¹ For more information, see "Designing for Hyperscale Computing," by Steven Croce, Brandon Draeger, and Buck Avey, in *Dell Power Solutions*, 2010 Issue 2, dell.com/downloads/global/power/ps2q10-20100360-cloud.pdf.



(SAN) applications, while other upcoming Dell PowerConnect switches are expected to facilitate performance-oriented switching for wide area networking and networking security applications.

The Dell Lifecycle Controller, delivered as part of the Integrated Dell Remote Access Controller (iDRAC) Express in 11th-generation Dell PowerEdge servers, embeds systems management features directly in the server—helping avoid media-based delivery of systems management tools and utilities. This delivery model helps simplify provisioning, deployment, patching and updates, servicing, and user customization. It also helps to reduce the time required to accomplish common tasks, reduce the potential for error, enhance security, and contribute to increasingly efficient management.

Simplified infrastructure management

Managing servers, networks, and storage as a common pool enables these resources to be rapidly redeployed to help meet dynamically changing needs. Dell's Efficient Data Center approach consolidates, streamlines, and automates the management of data center resources to bring virtual-like functionality to physical servers, help eliminate unnecessary management consoles, and dynamically reprovision servers. Advanced Dell systems can help administrators to efficiently

operate heterogeneous data centers—enabling them to rack and cable once, and then redeploy when needed.

Instead of replacing heterogeneous technology infrastructures with single-vendor platforms, Dell focuses on providing comprehensive, streamlined support for the range of platforms already at work in enterprise data centers (see Figure 2). This approach—which accommodates dynamic management of mixed technology environments, including platforms from Microsoft, VMware, Citrix, IBM, Hewlett-Packard, and Sun, in addition to Dell hardware—helps to deliver dynamic workload flexibility, enable automated deployment, and support highly efficient operations management.

Dell offers a range of technologies designed to simplify systems management. Dell Advanced Infrastructure

Manager software allows IT departments to manage networking, storage, and servers—both physical and virtual—as a single resource pool. This approach helps avoid resource silos, allowing organizations to allocate resources dynamically to meet changing workload demands. In addition, IT managers can seamlessly migrate workloads between physical and virtual environments to help organizations meet virtualization goals and extend the use of virtualization technology in the enterprise while also avoiding duplicate tools and processes.

Dell Management Console powered by Altiris™ from Symantec™ provides a single comprehensive view into an organization's IT infrastructure to help reduce the management complexity traditionally associated with data center infrastructure. IT managers can use this tool to monitor the

health of key systems or system subcomponents, and perform basic provisioning, discovery, inventory, power control, and alerting tasks.

Streamlined application and workload management

Advanced, application-aware workload and service monitoring as well as on-demand monitoring of underlying physical and virtual platforms can help dramatically reduce administrative burdens on IT staff—freeing them to focus on strategic projects that add value by advancing business goals and organizational objectives. In addition, by automating and standardizing the way IT resources are deployed, organizations can reduce the time and manual intervention required to allocate resources to applications. Tiered infrastructure offerings further help to create uniformity and facilitate cost containment and chargebacks.

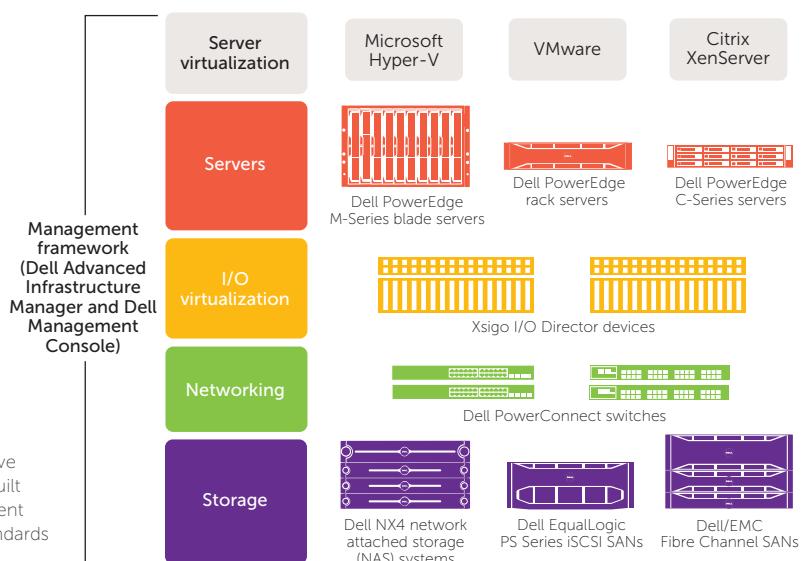


Figure 2. A comprehensive framework of purpose-built hardware and management tools based on open standards avoids vendor lock-in

“Automatically deduplicating and storing content on the appropriate tier and storage type can help control data storage costs while providing almost limitless storage capacity scaling.”

In the Dell vision of the Efficient Data Center, enterprises can rapidly deliver strategic IT services with new capabilities. The Dell road map includes a range of application and workload management functionality—including drag-and-drop image creation, self-service workload deployment, and advanced monitoring capabilities.

Intelligent Data Management

By automating management of data through predictable, scalable, and open data storage, enterprises can move toward maximizing the value of their data. Automatically deduplicating and storing content on the appropriate tier and storage type can help control data storage costs while providing almost limitless storage capacity scaling.

Strategies for Intelligent Data Management can include the following:

- **Storage tiers:** Enterprises reduce storage costs by using tiered storage infrastructures—matching data value with storage platform cost. Intelligent tiering alone can cut storage costs by 50 percent.
- **Object storage:** Policy-based deduplication, archiving, and search of structured and unstructured data help reduce storage costs by automating time-consuming manual tasks.
- **Virtualization optimization:** Storage arrays that are optimized for virtual environments help reduce costs and complexity.
- **Open standards:** Leveraging Fibre Channel and Internet SCSI (iSCSI) over 10GbE helps reduce fabric complexity, streamline maintenance, and simplify cabling configurations.

Dell offers support for Intelligent Data Management through Dell EqualLogic™ PS Series iSCSI SAN arrays, which are optimized for virtualized environments. Dell PowerVault™ tape

drives offer simplified storage solutions for branch office or cost-sensitive applications. And Dell/EMC SAN arrays offer highly scalable, flexible networked storage aimed at Fibre Channel-based storage applications. Dell has also recently announced new object-based storage systems with the Dell DX Object Storage Platform, which uses a self-managing peer-scaling architecture to enable organizations to access, store, and distribute billions of files or other digital content, from archiving all the way to the cloud.

A broader focus: Reinvesting IT efficiency gains to competitive advantage

Efficiency has become a basic tenet of business survival, and the relentless drive to increase efficiency is leading to a widespread transformation of the IT infrastructure. While executives are searching for the best way to increase efficiency and, in turn, competitive advantage, the largest share of many technology budgets is still going to fixed expenses that maintain the status quo. Technologies like virtualization offer many benefits, but they also create complexity when the proposed solution is a collection of proprietary offerings that restrict organizations with vertically integrated, premium-priced toolkits.

The Dell Efficient Data Center model goes beyond the efficiency basics of standardization, simplification, and automation to unlock the business value of enterprise IT investments. By implementing the four key pillars of the Efficient Data Center—intelligent infrastructure, simplified infrastructure management, streamlined application and workload management, and Intelligent Data Management—organizations can create an open and affordable approach to infrastructure that increases flexibility, reduces costs, and shifts the focus to how IT can help meet strategic enterprise goals. 



Lessons learned

After Dell reengineered its own IT architecture and infrastructure, it went public with best practices the company learned along the way. Watch this in-depth exploration of how a global enterprise boosted its own IT efficiency and reinvested the savings into innovation.

talktodell.com/go/transition-it/webcasts



The Efficient Enterprise:
dell.com/efficiententerprise



The Efficient Data Center:
dell.com/efficientdatacenter



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