



A virtualized IT infrastructure can deliver significant operational and economic benefits—boosting availability while slashing cost of ownership. Dell, Intel, VMware, Altiris and EMC provide industry-leading virtualization solutions that companies use today to gain a competitive edge.

**W**hen it comes to quantifiable business benefits, there's nothing "virtual" about a virtualized IT infrastructure. The payback is real—just ask Bob Neuberger, the Server, Storage and Database Manager for National Semiconductor. Santa Clara, Calif.-based National is the industry's leading manufacturer of high-performance analog devices and subsystems, reporting sales of \$1.91 billion in its most recent fiscal year.

Like many firms, National experienced years of growth in the de-

mand for Windows-based business applications. To provide the isolation necessary to run these programs reliably, National followed the common practice of deploying each on a dedicated server. Eventually the number of Windows-based servers and the cost of maintaining them became overwhelming—and most were very significantly underutilized.

"We had this beautiful farm of Dell PowerEdge servers," recalls Neuberger, "but many were only running at 5 percent of capacity."

Neuberger and his team chose an optimization strategy—based on Dell servers and VMware virtual infrastructure—that allowed them to consolidate up to eight physical servers as virtual machines running on a single Dell server.

"Our goal was to implement VMware software without purchasing any additional servers," Neuberger says. "We've easily accomplished that, despite continually implementing new Windows applications to support our internal customers."

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## A HIGHER STANDARD OF INTEGRATION

The close integration that distinguishes server virtualization solutions from Dell and competing offerings is nowhere better illustrated than in the partnership and joint development initiative between VMware and Altiris. The two companies have joined forces to address the challenges of concurrently managing both a host server infrastructure and a fleet of VMware virtual machines running on it.

Together, the two companies have created a hybrid administrative discipline called "Managed Virtualization." This combines Altiris' simplified approach to IT life-cycle management with the power of VMware virtualization. This innovative approach fosters efficient ways to manage not only physical servers, but also VMware virtual machines running as virtualized servers.

Managed Virtualization combines VMware technology with Altiris Server Deployment Suite and Altiris Server Management Suite. This combination provides IT administrators with enhanced capabilities to provision, deploy, manage and update Dell servers based on 64-bit Intel® Xeon® processors and VMware ESX Server running on that hardware.

The benefits that can result from this integration are clear and compelling: faster deployment of new services, streamlined management, reduced administration and improved responsiveness.

The payback? An expected 33 percent reduction in costs.

### BELIEVE THE HYPE

National's experience is being duplicated in data centers around the globe. Analysts at Framingham, Mass.-based IDC believe, based on a 2005 study of server virtualization, that companies are rapidly adopting virtualized servers by partitioning x86 systems to contain costs and handle growing workloads. This study further found that survey respondents currently using server virtualization technologies expect 45 percent of new servers purchased this year to be virtualized.

IDC expects spending on virtualization to approach \$15 billion worldwide by 2009. Analysts at Stamford, Conn.-based Gartner, Inc., concur. At Gartner Symposium/ITxpo 2005, the firm classified virtualization as a "megatrend," saying that it's the best tool that companies have right now to increase efficiency and drive up server utilization.

By decoupling workloads from physical server and storage resources through virtualization, enterprises can also:

- Enable dynamic capacity allocation
- Increase availability
- Simplify business continuity planning
- Reduce the cost of service delivery
- Lower total cost of ownership

The bottom line is that virtualization enables a more flexible and agile infrastructure—one that can respond readily to business change.

Regardless of the benefits, IT professionals may initially be wary of trading familiar challenges for new ones. Indeed, managing the transition from a physical data center environment to

a virtual one can be a seemingly complex undertaking, preventing many organizations from realizing the financial and operational benefits. Consider the steps involved in a typical virtual infrastructure rollout:

- Determine hardware requirements and select a virtual infrastructure partner to provide planning and assessment services
- Implement the appropriate supporting storage environment
- Select and deploy virtualization software, as well as management tools for both physical and virtual resources
- Manage the cutover with minimal downtime

There are also cultural issues to consider. For instance, some customers and managers are accustomed to "owning" a physical server. In some cases, they may need to be convinced that a virtual environment can deliver the same levels of security, performance, reliability and scalability as a physical one.

Objections aside, however, the simple truth is that the operational and economic benefits of a virtualized IT infrastructure are far too significant to ignore. Companies hoping to leverage the advantages of virtualization must find a viable and economical way to address the issues.

### MAKING VIRTUALIZATION MANAGEABLE

With these challenges in mind, powerful industry leaders—comprised of Dell, Intel, VMware, Altiris and EMC—are joining forces to bring standards-based innovation, volume production, and direct distribution to a virtualized IT infrastructure space.

Dell and its partners have worked



together to assemble and integrate a solution stack that makes the transition from a physical to virtual infrastructure swift and practical. The result is an easy-to-implement solution that packages leading hardware and software technologies, delivers them directly to the end user, and wraps them in the security of single-source support from the industry's most efficient provider of high-performance IT solutions.

Virtualization is an integral component of Dell's Scalable Enterprise Architecture, a framework for a highly efficient data center infrastructure. This framework combines standardized hardware and software components and a services organization capable of delivering automated, policy-based management in the future. It will enable dynamic real-time resource allocation in response to changing business conditions.

Dell brings together best-of-breed solutions, including server systems, SANs, services, virtual infrastructure software, virtual environment management software, and systems deployment and management software. Several key features set these solutions apart from the competition, including:

- A single, global point of contact for every aspect of assessment, design, delivery, deployment and support.
- Integration between management tools for both the physical and virtual environments.
- A full range of customizable virtualization solutions for small, medium and large companies.

Organizations worldwide are deploying these standards-based platforms today due to their unique combination of performance, tight integration, ease of deployment and unmatched value. Dell virtualization solutions address issues of low utilization and high management costs of existing environments, while preparing the IT infrastructure to scale and adapt more efficiently in the future.

## DELIVERING PERFORMANCE AND VALUE

The core components of virtualization solutions available through Dell are standards-based hardware, software and services that deliver optimal performance and integration without locking the user into proprietary technologies that inflate costs or limit flexibility. These components include:

■ **Dell PowerEdge Servers** offer a complete portfolio of blade and rack systems, in 2-way and 4-way configurations powered by Dual-Core Intel® Xeon® processors. Equipped with advanced reliability features for business-critical applications, Dell servers are designed to reduce the cost and complexity of enterprise environments by providing a standardized, high-performance platform for flexible, highly available and easily manageable scale-out architectures.

■ **Intel Virtualization Technology** provides silicon-level software support specifically architected for virtual machine monitors that improves the dependability and interoperability of Dell PowerEdge servers with leading virtual infrastructure solutions such as VMware ESX and VMware Virtual Center. Intel also provides core server platform technologies such as Dual-Core Intel® Xeon® processors that enhance server performance and conserve power, and provide the reliability and scalability to help grow your business, reduce costs and mitigate risk.

■ **VMware Virtual Infrastructure Technology** empowers IT organizations to match IT infrastructure—servers, storage and networks—to the information access and computing needs of their business. In a VMware virtual infrastructure the servers, storage and networking infrastructure can be treated as a common resource pool of flexible capacity. This is highly beneficial as a virtual infrastructure provides capabilities to rapidly deliver applications

## THE TRUE VALUE OF A PACKAGED SOLUTION

To fully appreciate the value of Dell's comprehensive and proven virtualization solutions, consider the technical and organizational complexity of designing and implementing a solution. Tasks include:

- Confront and overcome the cultural objections to a virtual infrastructure solution. Don't be surprised to find business owners deeply attached to the "one application, one server" paradigm.
- Assess the current level of resource utilization and the available underutilized capacity.
- Assess the physical requirements of the intended virtual infrastructure.
- Select and deploy a virtualization software solution that is compatible with the physical hardware and software components.
- Select and deploy appropriate software tools to monitor and manage the physical resource pool.
- Select and deploy appropriate software tools to monitor and manage the virtual environment.
- Plan and manage the cutover from physical to virtual resources without interrupting service delivery or negatively impacting normal business processes.

When viewed in this light—particularly with respect to the internal resources required to complete the tasks on this list—the net worth of a fully integrated, tested and proven solution rises significantly.

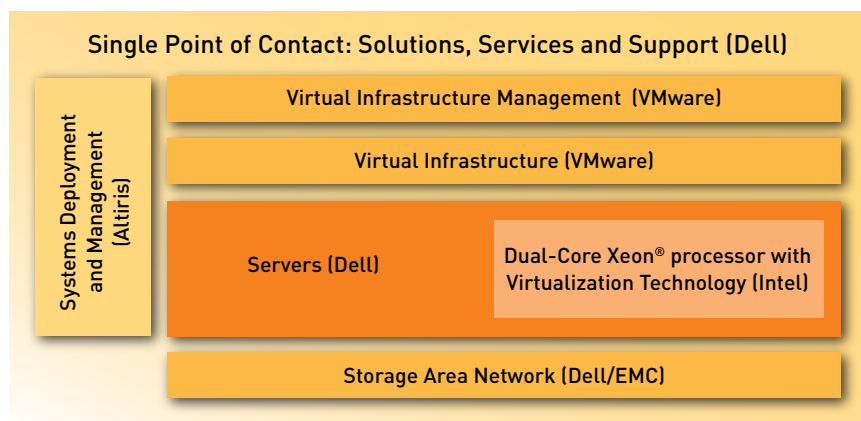
and services on the fly to users across the enterprise without the common effort and time required to procure and configure new IT resources.

VMware has a full range of software technologies that include a platform for migration of live virtual machine workloads across x86 host servers in a virtual infrastructure; systems management of virtual infrastructures; utilities that enable physical-to-virtual migration and simple server partitioning to manage multiple OS/application workloads on a single x86 host server. VMware virtualization technology provides many benefits to customers and lowers risk in the IT environment.

■ **Altiris Enterprise Systems Deployment and Management Tools** give IT administrators a comprehensive solution for monitoring and managing both virtual services and the physical servers that support them. Designed to simplify the entire server life cycle, the Altiris Server Management Suite provides deployment, management and monitoring functions from a centralized console to automate operations, improve system availability, and reduce overall infrastructure costs. It significantly reduces management complexity with comprehensive tools that streamline and automate provisioning, deployment, patch management, desired-state management and recovery services.

■ **Dell/EMC Storage Systems.** To eliminate virtual server dependencies on specific physical storage resources, consolidated storage is often necessary. Dell/EMC storage solutions combine EMC's data management technology leadership with Dell's unsurpassed capabilities in system design, manufacturing and distribution, providing a high-performance solution to support any size virtual environment.

■ **Dell Services** help companies realize the benefits of virtualization with solutions that deliver flexibility, ease



#### DELL VIRTUALIZED I.T. INFRASTRUCTURE SOLUTIONS INCLUDE:

- Dell PowerEdge servers powered by 64-bit, dual core Intel® Xeon® processors
- VMware virtual infrastructure and management software
- Dell/EMC storage area network solutions
- Altiris systems deployment and management tools
- Dell Services for planning, implementing and maintaining virtual physical environments

of integration and deployment options that match business and budget requirements. Offerings are grouped into three phases: assessment, design, and implementation. During assessment, Dell service professionals determine current and future system requirements and provide ROI and TCO analyses. Next, a scalable solution is crafted with minimal end-user disruption in mind. For the implementation phase, designs are validated, a pilot consolidation is conducted, and data is migrated to the new system. Finally, Dell Enterprise Support Services provide proactive support with 24/7 rapid response and resolution. By delivering complete, end-to-end solutions, Dell Services ensure smooth transitions and speed time-to-benefit.

#### VIRTUALIZATION: A PRACTICAL BUSINESS STRATEGY

Dell brings together the industry's foremost standards-based server, silicon, storage, virtualization and systems management technologies in a tightly integrated package that is business proven, deployment-ready and that

offers immediate benefits and positive ROI. These virtualization solutions are helping organizations worldwide unlock the power, potential and capacity of existing IT infrastructure, reduce costs, and respond more rapidly and profitably to new opportunities.

Just ask National's Neuberger. "When there's a hot new initiative, we can provision new servers in minutes," he explains, "and that helps reduce product development cycles. One of the main functions of IT at National is to enable the business to produce faster and more efficiently. The Dell-VMware combination is helping advance that goal by giving us tremendous on-demand capacity to meet the needs of our business."

By providing the business customer with a single source of sales and service responsibility, Dell is helping to bring the financial and operational advantages of a virtualized IT infrastructure to a wider range of potential beneficiaries. Whether your goal is consolidation, cost reduction, improved utilization, business continuity or increased agility, Dell server virtualization solutions hold the key to success.

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