WHITE PAPER

Achieving the Full Business Value of Virtualization with a Scalable Software-Based Storage Virtualization Solution

Sponsored by: DataCore Software

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IDC OPINION

Today's information-based economy demands that IT managers enhance the business value of existing and planned IT investments while simultaneously reducing the costs of IT operations. Server consolidation and broader adoption of server virtualization are some of the key strategies IT teams are counting on to meet these goals.

Dealing with storage, however, is one of the most critical technical and economic roadblocks to broad adoption of virtualization in many organizations. Limits include the up-front direct cost associated with replacing storage with complex networked storage systems, the added operational cost of managing networked storage systems, and the inherent inefficiencies of many of these storage systems.

Storage virtualization software such as DataCore's SANsymphony-V addresses many of these challenges. It allows organizations to make better use of "in place" storage assets while also ensuring that IT organizations can fully achieve a return on their investments in a virtualized server environment. They can achieve these goals by quickly taking advantage of the rapid cost declines and performance increases available in today's standard server platforms. IDC finds that the use of virtualized storage with solutions such as DataCore's makes it possible for companies to:

- Consolidate storage and server assets
- Increase the number of virtualized servers running on individual physical servers while doubling storage utilization rates for installed storage
- Leverage lower-cost/higher-capacity storage tiers that can significantly cut the cost of acquiring new storage assets
- Improve application and information availability while shrinking backup times
- Significantly reduce the cost to meet the performance and business continuity objectives of virtualized IT organizations

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TRANSITION TO THE WORLD OF VIRTUALIZED IT

Ongoing economic and business uncertainties are placing a growing strain on organizations around the world. Savvy investments in IT solutions can boost business efficiency, lower ongoing operating costs, and minimize future capital expenses, all while helping companies better respond to the needs of their own hard-pressed customers.

In datacenters around the world, 2010 was a landmark year in the use of server virtualization technology. It was the first year in which more new application instances were deployed as virtual machines on a virtualized server than were deployed on a dedicated physical server. While large enterprises and service providers were the early leaders in the use of server virtualization, 2011 will be a pivotal year for deployment of server virtualization in small and midsize organizations.

IDC is concerned that for many small and midsize organizations, efforts to consolidate and virtualize servers will fail to get under way or grind to a halt in midstream.

Real-World Risks of Aggressive Server Virtualization

Based upon the experiences of many large enterprises that engaged in rapid virtualization of server assets, IDC indentified a number of general reasons why efforts to further boosts in IT asset use and operational efficiency often fail to materialize. The shift to virtualized servers leads to significant disruptions in a number of areas:

- Overloading of storage and data network facilities
- Overprovisioning of storage capacity and a quantum leap in storage administration tasks
- Missed or incomplete data backup and uncertain application recovery

In large enterprises, IT teams typically responded by replacing older storage systems with new, bigger storage platforms. Small and midsize organizations, however, don't have the same resources. They don't have the budget or skill sets to embark on a wholesale replacement of both server and storage platforms.

Savvy IT managers recognize this problem up front and are forced to delay their plans. Many, however, discover the scope of the problem only midway through the process, leading to unplanned extra costs and/or a significant disillusionment of senior management.

Making Servers and Storage Work in Harmony Without Throwing Out Prior Investments

Early adopters of widespread server virtualization quickly recognized the perils associated with rapid virtual server growth and developed a standard strategy for avoiding problems.

These hard-learned lessons led them to explore smarter storage options, including device-independent storage virtualization software. The use of technologies such as virtual volumes, resource pooling, and thin provisioning allowed these companies to avoid both storage administration overload and the massive overprovisioning of storage for virtualized servers.

As noted earlier, the wholesale upgrade/migration to new storage platforms is possible in large enterprises with greater capital and IT staff resources. IT teams in small and midsize organizations need an inexpensive and nondisruptive solution that allows them to more effectively use existing storage assets; make better use of low-cost, standard server platforms for storage functions; and boost storage performance in support of virtualized server environments.

Lowering the Virtualization Barrier with Software-Based Storage Virtualization

An excellent option for small and midsize organizations is to deploy software-based storage virtualization solutions such as DataCore's SANsymphony-V. This solution allows organizations to leverage the amazing processing power of today's multicore x86 server platforms to virtualize installed storage systems while also tuning them to meet specific needs for performance, capacity, availability, and cost-effectiveness. These solutions:

- Improve utilization of existing storage assets (in many cases doubling useful capacity), thereby delaying the need to buy new storage systems
- Enable more modular and seamless storage expansion, thereby reducing the need to prebuy capacity that may not be needed for several years
- Automate storage provisioning, capacity, expansion, and data protection across installed heterogeneous storage systems, thereby reducing management complexity
- Enable seamless cross-system data movement, thereby enabling easy and intelligent migration or replication data between storage classes

Tiering allows companies to use one class of storage for performance-intensive applications while leveraging lower-cost (often 60% to 80% less expensive) and more scalable systems for backup/recovery, test/development/, or long-term archiving. In conversations with IT managers, IDC found that the most successful deployments of storage virtualization allowed companies to delay expansions of high-performance storage pools for more than 12 months while sustaining continued high (i.e., >50%) data growth rates.

THE BUSINESS VALUE OF DEVICE-INDEPENDENT STORAGE VIRTUALIZATION SOFTWARE

The remainder of this white paper looks specifically at the business value associated with the use of software-based storage virtualization in conjunction with previously installed storage systems. It also examines how the implementation of a virtualized storage environment ensures that businesses can fully achieve the benefits of a virtualized server environment. IDC finds that the use of virtualized storage makes it possible for companies to:

- Consolidate storage and server assets, thereby reducing the number of systems managed by 50% or more in many cases
- Increase the number of virtualized servers (often by 60% to 80%) running on individual physical servers while also increasing storage utilization rates from 20% or less (for direct attached) to more than 40% (and often over 50%), thereby reducing the need to acquire new server and storage systems in these difficult economic times
- Leverage lower-cost/higher-capacity storage tiers, thereby reducing the cost of acquiring new storage assets by up to 80% in certain cases
- Improve application and information availability while shrinking backup times by over 80% and reducing IT staff resources devoted to backup and recovery activities
- Eliminating much of the planned and unplanned downtime related to storage

For the purpose of this white paper, IDC compares and contrasts virtualization levels: nonvirtualized network storage, virtualized storage, and virtualized storage used in conjunction with virtualized servers. Table 1 provides a summary of both the gains and the limitations that still remain at each level of virtualization.

TABLE 1

Storage Efficiency Increases from Virtualization: IT Benchmarks

	Used Capacity as a % of Total Capacity	Average TB per IT Staff (Server and Storage)	Average Capacity (TB) Dedicated per Application
Networked storage	20	23.5	1.00
Virtualized storage	40	41.4	0.50
Virtualized servers and storage	70	72.4	0.29

Source: IDC, 2011

In Table 2, we also see the first business value elements that go beyond hard TCO data. A few items stand out and deserve discussion:

- **Flexible allocation of tiered storage.** Virtualized storage can leverage tiers of storage with different performance and cost characteristics so that administrators can easily assign applications to different storage pools.
- **Easy and nondisruptive data migration.** Data sets can be moved to more cost- or performance-oriented storage pools without disrupting server operations. Nondisruptive data migration also provides the flexibility to move virtual machine images as part of business continuity and disaster recovery efforts.
- **Efficient snapshot and replication of operating systems and applications for backup, test, and configuration purposes.** When IT deploys new applications, it becomes possible, with little more than some mouse clicks, to replicate environments that can be used for testing and experimentation.
- **Enhanced availability and rapid recovery for applications and data.** Companies can quickly restore applications by restarting them on another virtualized server. In many cases, this recovery can be automated, thereby reducing the need to use clustered solutions for high availability. The more sophisticated storage virtualization products can automatically fail over between redundant systems without disrupting applications.

TABLE 2

Business Value of Virtualized Deployment: IT Benchmarks

	Physical Servers per Manager	Downtime Hours per Physical Server per Year	Time to Launch Application (Weeks)
Networked storage	17	3.200	7.37
Virtualized storage	27	0.032	3.19
Virtualized servers and storage	30 (> 150 virtual servers)	0.026	0.57

Source: IDC, 2011

These findings make it clear that IT teams in small and midsize organizations can avoid significant pitfalls and gain significant additional benefits by deploying software-based storage virtualization solutions that complement server virtualization solutions. The key capabilities to look for include:

- Support for heterogeneous storage so that companies can better leverage installed storage systems and have greater negotiation leverage when upgrading and expanding
- Virtual storage pools and thin provisioning that boost utilization rates and reduce IT administration overhead
- Automated data migration, protection, and replication services that enable more automated and scalable business continuity

Return on IT Assets and Cost of Ownership Considerations

In IDC's ongoing research on storage for virtualized environments, companies that deployed storage virtualization as part of the replacement for standalone servers (with internal storage or DAS) realized the most significant savings and improved return on assets in the following categories:

- Reduced hardware and software spending due to higher utilization rates of both existing and new assets
- Reduced IT labor associated with full system and application deployment and life-cycle support (e.g., backup and recovery)
- Reduced facilities and infrastructure costs associated with datacenter space, power, and environment (e.g., heating, ventilation, and air-conditioning [HVAC] systems)

A number of companies leveraging storage virtualization combined with server virtualization reported a greater than threefold improvement in return on IT asset investments over a three-year period with many registering positive returns on deployments in less than a year.

The next section takes a deeper look at DataCore's storage virtualization solution in the context of these benefits. It examines how deploying this solution can help organizations of all sizes successfully complete the move to more virtualized IT environments.

DATACORE SOLUTIONS FOR STORAGE IN A VIRTUALIZED DATACENTER

DataCore Software Corporation is a leading developer of storage virtualization software for virtual and physical IT environments. Its goal is to leverage industry-standard processors and network technologies, along with its own storage virtualization and data management software, to deliver the highest availability, fastest performance, and maximum utilization of IT assets.

DataCore's device-independent solutions (which allow customers to virtualize storage assets from all leading storage systems suppliers) are designed to fundamentally change the economics of provisioning, replicating, and protecting storage for enterprises and small to midsize businesses.

DataCore has been delivering storage virtualization solutions since 1998 and released the eighth generation of its SANsymphony software in early 2011. It has over 6,000 customers around the world, many of which claim to have realized significant and sustained cost savings and productivity gains for several years.

It also has a large number of authorized distributors and integration partners around the world, many of which specialize in delivering and maintaining lower-cost and more responsive server and desktop virtualization solutions.

SANsymphony-V Release 8.0

DataCore's SANsymphony-V release 8.0 is a device-independent storage virtualization software platform that runs on standard multicore x86 servers (physical or virtual). A minimum of two servers are required for high availability, but customers can deploy more in a scale-out configuration for more performance. The solution's high-performance and highly available architecture provides a comprehensive set of capabilities that range from small environments with less than 10 terabytes of direct-attached or iSCSI storage to very large environments with hundreds of terabytes or petabytes of Fibre Channel (FC) or FC over Ethernet storage on heterogeneous storage systems.

The DataCore solution also provides an easy-to-use management interface with analysis tools that allow administrators to take full advantage of its storage virtualization and data management capabilities across the entire environment, not just individual systems. These functions include:

- Virtual disk pooling across heterogeneous storage systems (reduced administration, improved utilization, and painless data migration)
- High-speed caching and data tiering (improved and better-balanced I/O performance for installed storage assets)
- Thin provisioning (better utilization, reduced administration, delayed purchasing)
- Full spectrum of data protection/recovery including continuous data protection (CDP), low-impact snapshots, synchronous mirroring with automated failover/failback, and remote site replication (improved levels of data protection and less downtime from storage-related failures and disruptions)
- Support for more automated operations including autodiscovery, self-tuning, and high-availability "Quick Serve" disks to hosts (greater administrator productivity with less training and fewer errors)

SANsymphony-V release 8.0 also supports high-availability NAS/Cluster File Shares across heterogeneous storage systems.

CHALLENGES AND OPPORTUNITIES

The recent introduction of SANsymphony-V by DataCore is a clear signal that many small and midsize organizations are looking for help in jump-starting their server virtualization efforts. They need solutions that allow them to get the maximum returns from their installed IT assets while also ensuring that future investments deliver a superior return on investment. To deliver on this promise, DataCore must ensure that SANsymphony-V continues to support the widest range of hypervisors and storage systems, both old and new.

In today's challenging business environment, general claims of improved system efficiency or reduced administrative burdens are looked at with deserved skepticism. DataCore recognizes that storage virtualization is an unknown for many companies, raising concerns about practical uses, more complex management, and retraining of IT staff.

As part of its SANsymphony-V solution, DataCore must continue to enhance storage asset management capabilities and deliver even deeper integration with emerging virtualization orchestration solutions. As part of the SANsymphony-V launch, DataCore also identified a number of specific use cases where companies can achieve immediate and long-term benefits (e.g., desktop virtualization). The company and its partners need to identify additional use cases that will make it easier for IT teams to achieve quick benefits for storage virtualization.

CONCLUSION

IT managers at small and midsize organizations are wrestling with many of the same challenges as they seek to extend the business value of their virtualization investments. They are looking for solutions that improve the use of existing IT assets while also allowing them to take advantage of rapidly evolving server, storage, and network technologies. Meeting these objectives, however, requires more than just identifying the right use case and selecting the right solution. IT managers also need to make wise implementation decisions that shield them from costly system reconfigurations and storage migrations.

IT managers that acquire storage products must evaluate suppliers such as DataCore, as well as their business partners, based on more than just which company is providing the cheapest or highest-performing systems. IT managers need partners that can help them overcome or avoid the traditional shortcomings:

- Underuse of installed assets
- Less-than-optimal data/application availability
- Excessive administrative overhead
- Lock-in to proprietary hardware

IT managers should judge IT suppliers such as DataCore based upon how well their complete solutions allow them to optimize the use of IT investments now and for an extended period. They also need to look for business partners that leverage emerging solutions to address specific application and business challenges while delivering faster, more consistent implementations with minimal risk of disruption to applications, processes, and business operations.