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## Storage Virtualization: How to Capitalize on Its Economic Benefits

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# Storage Virtualization: How to Capitalize on Its Economic Benefits

## Executive Summary

The corporate IT world is diligently trying to solve difficult business issues on a massive scale. From a data growth perspective, there seem to be more demands and inefficiencies than budget to manage effectively. IT leaders are wrestling with everything from sluggish, isolated storage systems to disruptive, costly data migrations. They are considering how best to scale and manage the environment without adding more complexity, expense or risk.

The virtues of storage virtualization are many. Storage virtualization has become a mainstay in the enterprise environment, helping companies to modernize and simplify countless storage activities. However, many organizations are not fully capitalizing on its manageability and economic benefits.

This paper examines 5 key customer problems that storage virtualization can help to solve. It also looks at how to truly leverage virtualization technologies for significant savings on capital and operating expenditures (capex and opex). As an industry leader in proven, cost-efficient storage virtualization platforms, Hitachi Data Systems has a long history of helping organizations to design, deploy and leverage economically superior storage architectures across the data center.

In this paper, Hitachi provides a closer look at how to create new opportunities for rationalizing, simplifying and scaling storage throughout the enterprise. It also helps storage administrators understand how to minimize the budget and time overruns of complicated data migrations. It explains how they can apply online migration capabilities that dramatically reduce the costs and time involved.

With its highly acclaimed IT Economics program, Hitachi Data Systems enables enterprise organizations to explore the best methods for lowering the total storage cost structure. At the same time they can optimize existing storage resources.

Storage virtualization is the foundation of many of today's IT success stories. Read this paper to learn how some enterprises benefit from capacity efficiency gains, advanced storage virtualization designs and dual-vendor storage strategies.

## Introduction: The State of Storage Affairs in Today's Corporate IT

Storage virtualization seems to be a silver bullet squarely aimed at intractable cost-efficiency issues prevalent across most data centers today. Amid the ever-rising complexities, risks and expenses of managing data storage resides the promise of a real remedy that achieves business benefits through a more economical IT architecture.

Efficient, cost-effective information management is one of the top measures of business health. As IT leaders persistently pursue healthier data infrastructures, storage virtualization has evolved into a proven method for getting there faster.

Achieving better business health through cost-effective storage architectures requires more than status-quo technologies and thinking. For most organizations, there is now an urgency to manage and scale the business with economic exactitude, while still meeting new standards for compliance and data growth. In IT, this urgency means getting in front of complicated, often convoluted data environments that are continually shifting, changing and expanding. The only part of the data center that does not appear to be growing is the budget. The imperative for meeting the myriad of IT challenges is to identify and implement simpler, more reliable and affordable ways to manage it all. Some of these key challenges include the need to:

### Address Storage Growth Demands

Data storage is growing relentlessly. Lengthening retention regulations for compliance and e-discovery purposes coupled with a lack of aggressive management policies has created a glut of both structured and unstructured content. New enterprise infrastructure configurations associated with virtual servers have compounded the problems even more. To keep up with data growth, IT departments are buying endless amounts of storage capacity, trying to sweat inefficient assets, and preparing for big data applications that involve massive volumes.

Data center inefficiencies can grow faster than the data. Disruptions, downtime, low storage utilization rates and misalignment of data to the appropriate storage media all contribute. Opex can quickly spiral out of control, as efforts to manage the data infrastructure exceed opportunities for new storage capital purchases.

IT administrators are focusing on consolidation and simplification to meet storage growth demands and lower the total cost structure.

### Leverage Existing Assets to Meet Budget

Information has quickly become a highly valuable business commodity. Existing storage infrastructure is probably not driving up the value of the data, only the cost of it. The prevalence of older technologies and equipment makes it more difficult to optimize the storage environment. It is estimated that the annual cost to manage storage is about 60% of all enterprise storage-related spending, including software, power, cooling and administrative time.

IT organizations are looking to optimize current investments, as well as any future purchases. Inefficient technologies magnify costs and exponentially worsen with data growth. Reducing disparate systems and isolated data islands in favor of centralized pooled storage is essential to streamlining both operational and energy efficiencies. Storage virtualization helps to aggregate systems. Thus, it requires fewer storage systems, including older, less efficient ones, to store data and save on floor space, power and cooling costs in the data center. Making better use of capacity and foregoing traditional provisioning methods allow deferral on short-term upgrade costs. Efficient architectures reduce storage requirements, increase storage utilization, lower energy-related expenses and improve administrative productivity for a greater return on assets and investments.

## Manage Data Movement Issues

Data migrations can be painful in terms of cost, risk and complications. Most enterprise IT shops have to plan for storage platform end of life and migration to new storage. They must thoroughly consider the potential impacts on production environments and ensure ample support and expertise.

Storage system and data migration costs can escalate to as much as US\$15,000 per terabyte, and can take months to complete. Many businesses are already grappling with petabyte-size migration challenges. Limited maintenance windows, complicated SAN rezoning, orchestrating required host reboot activities, and administrative or support inexperience all quickly contribute to budget overruns and downtime durations.

IT is looking to minimize manual efforts, create more transparent migration activity and take advantage of flexible data mobility capabilities. In these ways, the price tag and hazards of moving data are diminished.

## Avoid Single-Vendor Issues

The all-in-1-basket approach to storage often leads to unintended outcomes. Some organizations have accumulated a jumble of vendor products or employ a best-in-industry strategy, and both of these approaches present challenges in fast-growing environments. Likewise, having only 1 storage vendor has a unique set of risks. By relying on only 1 storage provider, enterprises set themselves up for poor pricing economics, less competition and less innovation. For multitiered environments, the opportunity to save on mid- and lower-tier storage through competition is lost. A dual-vendor strategy for storage preserves an organization's ability to create a more balanced, nimble and cost-efficient data environment.

## Ensure Reliability Across the Storage Infrastructure

Reliability is fundamental and key in designing a more manageable and therefore cost-efficient IT environment. Outages, data loss or corruption, and difficulty accessing information or applications collectively impact a company's ability to meet customer, regulatory and financial obligations.

Building resiliency and stability into existing and future scenarios starts with understanding what technologies are available and can fit together in a clean way. Assessing reliability factors across the data center is critical. Are there risks of outage or noncompliance? Can legacy systems be consolidated and rationalized to simplify backup, archiving and disaster recovery?

When reliability is intentionally built into the storage environment, organizations are better prepared to protect data and the business.

## The Tools for Achieving Cost Efficiencies

Making strides toward cost-effective data storage that maps to anticipated growth demands, as well as unforeseen changes, means equipping IT leaders with a new set of tools. What are the tools of change that can unify visibility and manageability across storage, and how can businesses capitalize on them for greater cost savings and business health?

## The Role of IT Economics for Bettering the Bottom Line

IT leaders know that they can only improve what can be measured. While dollars-per-megabyte formulas and hardware-only equipment justifications do help to quantify costs, they are inadequate for accurately gauging the total cost of storage ownership (TCO).

A working knowledge of the TCO is essential to assessing the true price of storage. The purchase of hardware or infrastructure, known as capex, typically accounts for only 25% of TCO. The remaining 75% is allocated opex, those less tangible, softer costs related to administration, energy, support and so on.

IT Economics provides a proven framework for bettering the bottom line. IT Economics has cataloged nearly 3 dozen different types of capex and opex costs. The program aids IT in pinpointing and classifying these insidious budget busters, for a precise picture of what storage is actually costing in the environment. Using comprehensive cost-to-solution mapping and extensive expertise in financial modeling, IT Economics applies a systematic approach to help IT leaders reduce costs over time.

## Understand the Value of Capacity Efficiency

Some industry experts have predicted the perfect storm for creating a storage efficiency crisis. Growth in the amount of data and content being kept and stored online continues to accelerate. This growth is driving demand for unprecedented amounts of disk storage, while for a number of reasons rapid price declines have slowed or stopped. The old standby challenges of low utilization and stranded storage only add to the calamity. Thus, organizations must become smarter about storage utilization and reclamation across current storage assets. Capacity efficiency as a whole seeks to accomplish the following:

- Increase storage utilization to be able to use more of existing and new assets.
- Reduce or defer capacity purchases in step with business growth.
- Reclaim capacity and free up high-performance capacity for future use.
- Repurpose and extend the useful life of existing assets by managing heterogeneous storage capacity as a single pool that inherits the benefits of parent storage systems.
- Take advantage of cost savings features, such as thin provisioning and dynamic data mobility, with existing storage systems, not just new ones.

Hitachi Data Systems employs best practices, assessment services and more than a dozen proven technologies to help organizations proactively address capacity efficiency through reduction, reclamation and deferral.

## The Role of Storage Virtualization in Creating Cost Efficiencies

At the core of capacity efficiency resides storage virtualization and storage pooling. Virtualization and pooling helps organizations reclaim, utilize and optimize storage to craft an economically and ecologically superior data center. The important characteristics of virtualization are reduced complexity when compared to managing devices discretely and greater capability to improve services. When storage is virtualized, logically pooled and centrally managed, costs for hardware, SAN infrastructure and environmental controls go down. Flexibility, scalability and cost efficiencies accelerate.

## In the Box and Out

A key storage virtualization technology performed internally, or inside the box, is thin provisioning, also known as dynamic provisioning. Unlike traditional provisioning, which requires projected growth of a volume to be fully allocated, dynamic provisioning presents only the capacity actually used, freeing up other capacity until needed. In this way, a virtual pool of shared capacity can be larger than the actual amount of physical storage available. This sizing enables administrators to deliver capacity on demand from a common pool of storage. What differentiates it in the virtualized storage environment is the ability to dynamically provision from both internal and external storage. Thus, it allows advanced virtualization capabilities on older or lower-tier storage systems.



Thin provisioning reduces waste of allocated capacity, improves performance with wide striping, and enables storage reclamation. Extending thin provisioning through storage virtualization and logically pooling internal and external resources make opportunities for greater efficiency possible. Virtualization outside the box enables seamless integration of new and future capabilities, including data migration, lifecycle management, media migration and integration of data across applications.

Storage virtualization can bridge to more advanced efficiency technologies. It can support virtualized multitiered storage architectures and dynamic tiering, as well as multitenancy and cloud services. With this support, the cost efficiencies of storage virtualization can be exponential.

## Controller-Based Storage Virtualization

Storage virtualization is performed in several ways, including host-based, controller-based and appliance-based. Hitachi Data Systems uses storage controller-based virtualization, which separates the storage controller from the disk storage system. This approach separates logical views from physical assets and allows heterogeneous multivendor storage systems to be directly connected to the controllers.

Using a single management interface, Hitachi virtualization permits the external systems to be "discovered" so they can be managed along with internal disks as a single pool of storage. Pooling these resources in a logical way helps remove the physical barriers and optimizes the resources to reach their full potential. The complexity associated with all the components required to deliver storage is buffered behind intuitive virtualization software that helps simplify operations of managing the environment. More importantly, the virtualization software delivers greater flexibility to meet the needs of applications.

This block-based virtualization technique permits the externally attached storage to leverage capabilities of internal storage. For example, it allows nondisruptive data migration, replication, partitioning and thin provisioning, without extra hardware, latency issues or new complexity. In a recent engagement, Hitachi Data Systems was able to improve storage utilization by over 30%. In addition, in a recent survey of IT organizations using Hitachi enterprise storage, more than 70% rated Hitachi support for externally virtualized storage as very good or better.<sup>1</sup>

As a result, organizations can achieve the right cost, performance, reliability and availability characteristics of storage, as needed, to match with application requirements. In turn, storage infrastructure is flexibly aligned with business requirements.

## Leveraged Benefits

Virtualization has become a mainstream technology and is used to increase hardware utilization as well as lower operating costs in the data center. Virtualization capabilities can be extended to other forms of storage and platforms, such as NAS, iSCSI, active archive and virtual tape libraries. Even mainframes can be connected to reduce islands of stranded storage and provide greater data protection, search and management functions across the entire environment.

With virtualization embedded in the controller, an enterprise storage system has up to 10 times the cache size, 6x the IOPS performance and more port connectivity than a SAN-based virtualization appliance. These benefits extend scalability well beyond SAN-based appliances. For modular attached storage, using controller-based virtualization can enhance performance by as much as 30%.<sup>2</sup>

<sup>1</sup> Source: TechValidate survey, TVID: F21-DA2-763 and TVID: BA6-25B-E4B

<sup>2</sup> Storage Virtualization for Dummies: Hitachi Data Systems Edition, 2010 by Wiley Publishing, Inc., <http://media.wiley.com/assets/2112/24/9780470597705.pdf>

The right virtualization environment creates a synergy for doing more with less complexity, less risk and lower costs. Storage services are now aggregated for agile, scalable and service-level-based delivery. Improvements in capacity, manageability, integrity and reliability promote a better return on assets (ROA). The bottom line for storage virtualization's command of capacity efficiency is that it becomes cheaper to virtualize and reclaim existing storage than to purchase new capacity. The areas where virtualization can affect cost reductions include:

- Lower capex.
- Reclaimed capacity.
- Longer asset usefulness.
- Lower cost of growth with overall utilization improvements.
- Cost of migration.
- Labor, tools, outage, ROA.
- Cost of software licenses.
- Common pool, 1 source for control, replication.
- Software maintenance costs.
- Hardware maintenance costs.
- Support rates commensurate with the tier of data.
- Demotion of older assets (as appropriate) to lower tiers and different maintenance rates.



## THE ECONOMICS AT ATOS

“The customer is always right” has taken on a whole new meaning at Atos, a highly successful systems integrator and outsourcing company based in Europe and Asia Pacific. When its largest customer, an international bank, wanted to overhaul its hosted IT environment at Atos, the focus was on creating a superior storage architecture. The plan was to drive efficiency and resiliency up and costs down. The bank requested that Atos re-engineer its infrastructure to include virtualization and tiered storage, with the goal of pushing utilization rates to near 80%. At the same time, it wanted to lower the overall total cost of storage ownership.

With the help of Hitachi Data Systems, Atos built a highly nimble and cost-efficient multitiered ecosystem that answered the bank’s call. Atos initiated a systematic unified approach to managing future growth for all its customers. Atos won a 7-year contract renewal with its big customer, along with a model and path for its future corporate growth.

*We have grown from 1PB to 1.8PB, and have converted from a single, Tier 1 structure to very-well-organized multiple tiers. We have already improved storage utilization from its original 25% to 35%, to now utilizing at 66% and counting.*

**– Stephen Ko, Director of Operations for Atos Managed Services in the APAC Region**

## ATOS STORAGE VIRTUALIZATION BENEFITS

- Simpler data migration and mobility.
- Development of a service catalog.
- Ability to monitor capacity utilization and performance.
- Signification cost savings.

*We have achieved a blended overall rate of 30% cost reduction in storage, by distributing Tier 1-only storage across the new hierarchy of tiers. With the Hitachi technology in place, we have been able to reduce overall costs of managing, storing and safeguarding large amounts of data. I expect that this type of trending will likely increase, which is fantastic from a financial perspective, as well as for customer satisfaction and loyalty. We can invest in advanced technology and can still earn from our investments.*

**– Stephen Ko, Director of Operations for Atos Managed Services in the APAC Region**

## The Top Use Cases for Virtualization

Consider the merits of storage virtualization for meeting greater capacity efficiency, demanding data growth and better business value. Examine the following use cases.

### Consolidate, Simplify and Scale

How does storage virtualization help the corporate IT department overcome the complexity and cost of disparate data growth and access? As the numbers of interfaces, tools, systems and software proliferate across a fragmented storage enterprise, so does the amount of time and money to manage it. A lack of flexibility hinders the storage administrator's opportunity to assess problems, provide access, provision services and attempt to optimize

resources. In a survey of more than 200 Hitachi virtualization customers, 70% rated consolidation and simplification as a 4 in importance on a scale of 1 to 5, with 5 being most important.<sup>3</sup>

IT organizations can slow the need to purchase extra assets by using storage virtualization. They can ensure that the technologies in place maximize value from current storage investments while handling data growth needs. These technologies include dynamic provisioning, dynamically tiered storage, data deduplication, storage consolidation and integrated archiving.

By consolidating storage through virtualization, administrators can rapidly reduce the clutter of disparate or stranded systems and thereby begin to simplify the storage infrastructure. As external assets become virtualized and centralized into a common storage pool, IT can better align storage tiers with business and application requirements. Higher performance disks can be saved for true Tier 1 mission-critical data, while less-active or less-critical data can reside on lower-cost tiers. In these ways, service level agreements (SLAs) are more easily accommodated, too.

When data storage infrastructure is unified with a single management interface, IT is able to take advantage of higher-level features that further efficiency. For example, using a single pane to manage all the storage assets allows external systems to be optimized with virtualization tools as if they were internal to the system. Now, all storage, regardless of where it sits in the virtualized framework, has access to online data migration tools, dynamic provisioning and replication activity. Unified storage is able to deliver a shared storage services model for multiple applications across the SAN for increased storage utilization, flexible scalability, better performance and better data availability.

### Leverage Current Assets

By using storage virtualization, organizations can reclaim capacity and increase utilization on their current storage systems. These benefits are a boon to IT departments trying to save on the soaring cost of hard disk drives and extend the useful life of existing assets. Nearly 90% of IT organizations using Hitachi enterprise storage systems were able to increase storage utilization by 11% to 25% with virtualized storage. Financial services companies with data-base- and online-intensive applications saw increases between 26% and 40%.<sup>4</sup>

Hitachi Data Systems recognizes several important technologies that, in concert with storage virtualization, further leverage current assets and promote greater cost efficiencies (see Table 1). Technologies such as Hitachi Dynamic Provisioning create pools of pages that are spread across many RAID groups. Therefore, when a volume is created, it is written a page at a time across the width of the pool, automatically generating wide-stripe performance. To increase the stripe or make changes to the RAID group, Dynamic Provisioning performs these tasks automatically and rebalances the stripe transparently, for greater operational efficiency over manual striping.

Greater flexibility optimizes disks across various scenarios, or when considering higher-density drives. Architectures that use technologies such as Hitachi Dynamic Tiering eliminate the need for time-consuming manual data classification and movement, to optimize usage of tiered storage and management of data lifecycles. Data is automatically moved on fine-grained pages within the virtual volumes to the most appropriate media, according to workload requirements.

Another effective technology is storage reclamation. Reclaimable storage is often the most easily realized benefit available through storage virtualization. Reclamation allows untouched storage space to be folded back into the useful pool of storage capacity, by moving "thick" volumes (those volumes that are provisioned traditionally) to centralized "thin" volumes. This process helps reduce the need for storage at current rates and defers disk purchases while optimizing current resources. Many companies have a low storage utilization rate but are unable to reclaim a portion of their unused allocated storage because of archaic infrastructure and processes. In fact, companies with

<sup>3</sup> TechValidate Survey, TVID: EC4-04B-275

<sup>4</sup> TechValidate Survey, TVID: B87-0D5-DB5 and TVID: BEF-53F-6F8

inefficient storage use often continue to spend on new storage capacity despite the significant amounts of reclaimable storage available within their existing infrastructures. This practice results in new capex, which in turn increases opex because of the need to manage the associated new storage.

**TABLE 1. TECHNOLOGIES THAT LEVERAGE CURRENT ASSETS AND PROMOTE COST EFFICIENCIES**

Technologies	Benefits
Tiered storage with Hitachi Dynamic Tiering	Integrating automated tiered storage architectures fosters better performance, greater simplicity and higher availability. These improvements equate to lower acquisition and operating costs for any production environment.
Disk configuration optimization	Proper setup of physical and logical drives is essential for optimizing drive performance of existing and new storage resources. Thin provisioning and automation of wide striping across disk drives increases capacity utilization and enables greater flexibility and optimal drive performance of existing and new storage.
Zero page reclaim and write same	These storage reclamation technologies return unused storage to the virtualized pool as free space, helping to recoup capacity on existing storage resources and improve opex costs to manage utilization.
Thin replication and copy-on-write	Replicating data stored on a thin-provisioned volume, and copying only the portion of the volume that is actually being used, saves on communications bandwidth and costs for greater replication efficiency.
Service catalogs and chargeback information	Standardizing storage configurations and clearly defining service level metrics, unit costs and storage services allows organizations to segregate and meter capacity consumption of user groups in multitenancy situations. It supports accurate chargeback capabilities and reporting.
Compression, deduplication and single instancing	These intelligent archiving technologies are key in efficiently using high-performance, high-cost storage. They eliminate unnecessary duplicate data, saving space and automating the movement of stale data to lower-cost tiers. They also reduce backup costs, allowing for faster and more granular recovery, reduced backup times and fewer data volumes.

### Boost Data Mobility and Migrations

Data mobility is more than the ability to move data, volumes and applications: It is about how to move it to bolster business continuity, to reduce risk and to lower costs for the organization. One of the most recognizable use cases for storage virtualization is better data mobility, especially when it means less painful data migration activity.

Organizations are always looking for ways to minimize the burdens associated with data migration. Two of the biggest concerns of migration projects are downtime and budget overruns. According to a TechValidate survey, the average enterprise storage migration project runs 4 to 6 hours per host. This range includes the time to plan and execute, and 70% of customers reported schedule overruns.

### Build a Bridge to Easier Online Migration Strategies

Organizations spend considerable resources and assume more risk than necessary to conduct data migrations. The use of heterogeneous storage virtualization technologies minimizes risks and costs. By connecting the old storage

systems with new storage via the SAN, no outage is required. Migration activities such as host discovery, configuration, testing and data copy are transparently redirected to the new system. Once all the data is on the new storage, the legacy system can be removed or decommissioned.

Online migration is essential for scaling large amounts of data, running higher data throughputs and ensuring flexibility for various outage windows. Automating data migration enables seamless movement between tiers and subsystems to amplify application availability and reduce IT and business risk. Additionally, administrators are able to initiate and enforce policy management and reduce the costs for meeting SLAs.

## Apply a Risk Estimation Strategy

Online migration and storage virtualization greatly decrease the costs and perils of long, drawn-out migrations that require manual intervention. But any migration has inherent risks, and being able to avoid them requires a strategic approach to risk estimation.

Organizations can begin by leveraging a vendor who understands how to successfully migrate data across various platforms and multiple technologies. Evaluating business continuity plans requires expertise that few organizations have in house.

Hitachi Data Systems Global Solution Services (GSS) offers a Risk Analysis Workshop for just this reason. The Risk Analysis Workshop provides a unique and proven approach to helping IT assess the resilience of their environment and prioritize plans for how to resolve gaps. For organizations trying to address data protection, payback, justification and risk management issues, the Risk Analysis Workshop consultants give guidance. They provide a systematic evaluation to identify the gaps in the company's risk management. Following the workshop, Hitachi also offers Quantitative Operational Risk Assessment services, during which GSS consultants design the optimal solution to close material gaps identified in the workshop. This design includes both technical and economic analysis. As a result, organizations are prepared to make more informed decisions about their business continuity investment and how best to improve the quality of service they provide.

**Storage  
Readiness  
Checklist**

REVIEW

## EXAMINE THE ECONOMICS AT OVERSTOCK.COM

Overstock.com used storage virtualization to significantly reduce both capital and operating costs.

*We've reduced data-migration-related downtime from several hours to less than 30 minutes. Overall, by using Hitachi virtualization, dynamic provisioning and tiered storage, we've reduced our capital and operating costs for an improved return on our storage investment.*

**– Carter Lee, VP Technology Operations, Overstock.com**

## THE STORAGE SOLUTION

- Hitachi enterprise storage with Hitachi Dynamic Provisioning software.
- Seamless and nondisruptive data movement between storage systems.
- Consolidation and unification of all heterogeneous storage into a single virtualized pool that can scale up 247PB.

## CAPACITY EFFICIENCY BENEFITS

- Reduced technology-refresh time by up to 90%.
- Reduced provisioning tasks by up to 80%.
- Initial reclamation yielded savings of approximately 50%.
- Improved utilization rate to about 80%.

*Hitachi Data Systems has quickly simplified the process of nondisruptively provisioning storage. With Hitachi virtualization technologies, we've seen storage capacity savings of 50% on some arrays, can now provision storage in 25% of the time, and have increased utilization rates by over 30%.*

**– Carter Lee, VP Technology Operations, Overstock.com**

## Dual-Vendor Sourcing

Organizations that operate under a dual-vendor strategy are looking to overcome inherent costs and risks of having only 1 provider and 1 infrastructure. The value of deploying a dual-vendor strategy comes in acquiring greater infrastructure flexibility and cost savings.

By balancing the storage environment with a blend of 1 or more storage vendors, administrators are better able to achieve cost savings in the critical high-growth area of 2nd-, 3rd- and lower-tier storage. The key drivers for deploying a dual-vendor strategy include reducing costs while driving up innovation, flexibility and choice.

It is critical to ensure that vendors are chosen to meet certain criteria, such as open standards, unified interfaces and flexibility. These standards enable greatest interoperability, availability and the ability to seamlessly virtualize storage. By virtualizing all the applicable capacity across the storage environment, there is greater opportunity to retain operational efficiencies and simplify management.

According to a Gartner analysis, dual-vendor tactics can lower storage acquisition costs by 25% or more, as compared with organizations maintaining a single-source storage infrastructure<sup>5</sup>. Organizations considering dual-vendor sourcing have the opportunity to commoditize and attain a lower cost of procurement. Competition among vendors results in better pricing for potential solutions. The requesting organization is able to choose the cheapest solution that meets business needs. The new system, no matter how comparatively inexpensive, inherits the best features of the Hitachi storage controller.

### EXAMINE THE ECONOMICS OF DUAL-VENDOR WINNERS

Consider these examples of the dramatically lower total cost structure possible with implementation of a dual-vendor strategy.

#### Global 10 Telco Operator - European Headquarters

Hitachi Data Systems submitted a proposal to consolidate a number of international data centers as a competitive approach to the incumbent vendor.

Results:

- The incumbent reduced its proposal price by 36% from US\$19.5 million to US\$12.5 million.
- The telco adopted a dual-vendor approach to storage infrastructure for an annual spend of US\$100 million.

#### Global 5 Technology Company - US Headquarters

A large global technology company that has been predominately a single-source supplier has seen more than US\$10 million in savings just by engaging Hitachi Data Systems. This savings was apparent even before any purchase.

Results:

- These savings were in 1 department.
- Hitachi Data Systems has since saved this customer an additional US\$5 million by competing in requests for quotes (RFQ). Subsequently, it also won business by helping to create a dual-vendor strategy within the organization.

#### Global 5 Technology Company - US Headquarters

A recent auction for global dual-sourcing generated the following savings:

- Costs reduced by 46% for SAN storage.
- Costs reduced by 47% for NAS storage.

## Create Rock-Solid Recovery and Compliance

A true measure of successful storage environments can be found by reviewing recovery and compliance strategy. It is assumed that the majority of enterprise data centers feature storage systems and storage network infrastructures

<sup>5</sup> Gartner, Inc., "Toolkit Decision Framework: Viability of Pursuing a Dual-vendor Disk Strategy," by Stanley Zaffos, Adam W. Couture, and Stewart Buchanan, April 2007.

from multiple vendors. Regardless of how the storage environment is managed, organizations must be able to ensure system-wide backup, archival and disaster recovery capabilities, and compliance with numerous legal and regulatory requirements. If the storage landscape is highly complex, fragmented and difficult to manage, reliability can suffer, leading to myriad problems. Figuring out how to achieve reliability cost-efficiently, in a single clean way rather than in many different ways, is both more effective and economical.

Virtualization technologies provide the base for a simplified storage architecture that ensures cost-effective reliability and system-wide compliance. Achieving reliability by design allows an organization to put in place an economically superior storage architecture. Such an architecture is capable of increasing reliability, reducing risk of outages, minimizing the impact on business operations and lowering TCO.

As strengthening resilience across the storage environment is essential for supporting business continuity requirements, unified disaster recovery and long-term archiving are called for. One mainstay for accomplishing these goals is rationalization of storage. Rationalization is the ability to obtain a single or cohesive view of data across all systems while maintaining different aspects of the data to leverage information and better manage operational processes. Rationalizing and consolidating these assets into an optimal portfolio provides a much more effective, responsive and flexible model for the future. Rationalization and consolidation rapidly help to lower costs while improving IT's ability to safeguard data.

Rationalizing new storage is fairly straightforward, while rationalizing existing storage, which is being accessed by multiple applications and involves multiple layers, is more challenging. The right storage virtualization solution goes a long way in helping to ease the processes associated with rationalization and to do so with as little disruption to assets as possible.

An important tenet of economically superior Hitachi storage architectures is creating a foundation for an economical but rock-solid recovery and compliance design.

## Final Notes of Consideration

By observing the cost benefits that storage virtualization affords, IT leaders are better equipped to make informed choices for how to proceed with data center improvements. When storage services are collectively orchestrated, capacity efficiencies flourish. The integrative properties of storage virtualization allow for pervasive consolidation, reclamation and increased utilization of stranded assets, while simplifying data movement activities.

Storage virtualization technologies help to extend the useful life of externalized storage, to optimize pooled storage resources and to create new cost-effective opportunities for flexibly managing data growth demands. For companies operating a dual-vendor strategy, folding in the right storage virtualization technologies can further advance both capex and opex savings while promoting greater stability and innovation across the enterprise. By procuring an elegant, reliable and unified storage environment, organizations end up with a lower total cost structure, less complexity and risk, and greater agility to meet future challenges.

For more information on Hitachi storage virtualization technologies and services, please visit [www.HDS.com](http://www.HDS.com).

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