Software-Defined Storage Accelerates Storage Cost Reduction and Service-Level Optimization

Sponsored by: DataCore Software

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IDC OPINION

According to a recent IDC survey, more than 35% of organizations are evaluating investing in software-defined storage (SDS) solutions in 2014 – and this is in line with a number of recent IDC conversations with IT executives that are looking to develop their next-generation storage architectures to keep up with increasing business demands while reducing IT costs.

SDS is a similar concept to server virtualization, where IT managers can use standard x86 building blocks or a heterogeneous set of storage hardware and present it as one storage pool to the applications. The characteristics of this storage pool (block, file, object, etc.,) can be defined at the software layer. This emerging storage architecture is currently getting a lot of interest from IT and storage managers, as they are trying to drive down storage cost to free up IT budget for innovation-related projects, while improving service levels and operational efficiency.

The need for responsive, resilient, flexible, yet cost-effective storage services independent of the hardware models and manufacturers chosen has never been greater. Companies of all sizes are experiencing relentless data growth driven by more demanding business applications and by the expanding base of users on virtual desktops and mobile devices, all connected to the Internet of Things. This expanding universe collects vast amounts of data for businesses to analyze in order for them to better understand their customers and help them react and communicate through social networks. To stay competitive businesses need to be able to quickly access relevant information; therefore they are looking for new ways to capture, store, protect, and manage all of the company data with a more operationally efficient and lower-cost storage architecture.

SDS solutions offer a promising new approach to deal with these challenges. SDS enables companies to take better advantage of existing storage investments, easily incorporate new high-speed flash-based storage technologies, and leverage commodity hardware savings. These objectives are accomplished by removing dependencies on expensive, proprietary hardware through an independent software services layer that optimizes the use of these devices infrastructurewide and thus delivers sharply improved price/performance/manageability characteristics.

The mainstream storage vendors have arguably failed to meet the needs of today's companies, choosing instead to perpetuate proprietary storage systems with locked-in functions. Many of them are struggling to change their roadmaps to include SDS solutions. They, along with numerous startups, are indiscriminately applying the term "SDS" to hardware-centric products.

In this document, IDC assesses DataCore in the SDS space. DataCore is one of the leading providers of hardware-independent storage virtualization software. Its customers are actively leveraging the benefits of software-defined storage in IT environments ranging from very large datacenters to more modest computer rooms, thereby getting better use from storage equipment already in place.

IDC believes that SDS is going to become the preferred architecture for storage environments in the near future, and DataCore is well positioned to help customers make the transition rapidly and smoothly.

IN THIS TECHNOLOGY SPOTLIGHT

This IDC Technology Spotlight discusses the emerging storage architecture of software-defined storage and how DataCore enables its customers to take advantage of it today.

SITUATION OVERVIEW

A major transformation is underway which IDC calls the move to the 3rd Platform. Four major forces are changing the way we use IT to do our jobs. The new ways in which we collaborate and do business through cloud services, social business, mobile devices, and Big Data analytics demand an accompanying fundamental change in the underlying IT infrastructure. Analytics is done in real time, data is consumed through a variety of devices from the cloud, and communication happens on social platforms – this puts a significant strain on the IT infrastructure to provide the required performance while at the same time drive down operational cost to free up funding for new (mobile) application development.

IT managers striving to deliver responsive IT as a service to their users to gain a competitive edge recognize that their storage architecture can make or break the IT infrastructure. IDC has found, however, that mainstream datacenter storage has not yet undergone the dramatic transformation needed.

Storage architectures need to change to keep up with the changes in the overall IT infrastructure. Data is no longer exclusively located in disk drives on a server or in a storage array; today flash-based technologies and cloud storage are now part of the storage spectrum. In order to take advantage of the broad spectrum of available storage technologies and to place data on the appropriate price/performance storage, automated storage tiering is an essential functionality of a next-generation storage architecture.

The time has now come to fundamentally improve the storage architecture by abstracting the storage services from the underlying hardware devices in a similar model to server virtualization. Doing this frees storage to be provisioned by policy and allows IT managers to selectively substitute low-cost, commodity storage hardware in place of expensive proprietary systems during each refresh and expansion opportunity. The result is more flexible, more automated operations with built-in resiliency and disaster recovery at a significantly lower price point than was possible in the past.

Figure 1 shows the top storage priorities for 2014. Ensuring data protection and compliance has captured the minds of IT organizations around the world, particularly in view of the NSA mass-

surveillance scandal in 2013 and the pending European Union data protection regulation. Reducing storage-related cost has been a top priority for many years and remains one of the key challenges in the midst of increasing capacity and performance expectations. Only a new storage architecture will make this possible while maintaining the continuous availability of virtual machine images and improving disaster avoidance. SDS allows IT and storage managers to lower the cost of retaining data while enabling organizations to comply with data protection regulations.

FIGURE 1

2014 Storage Priorities
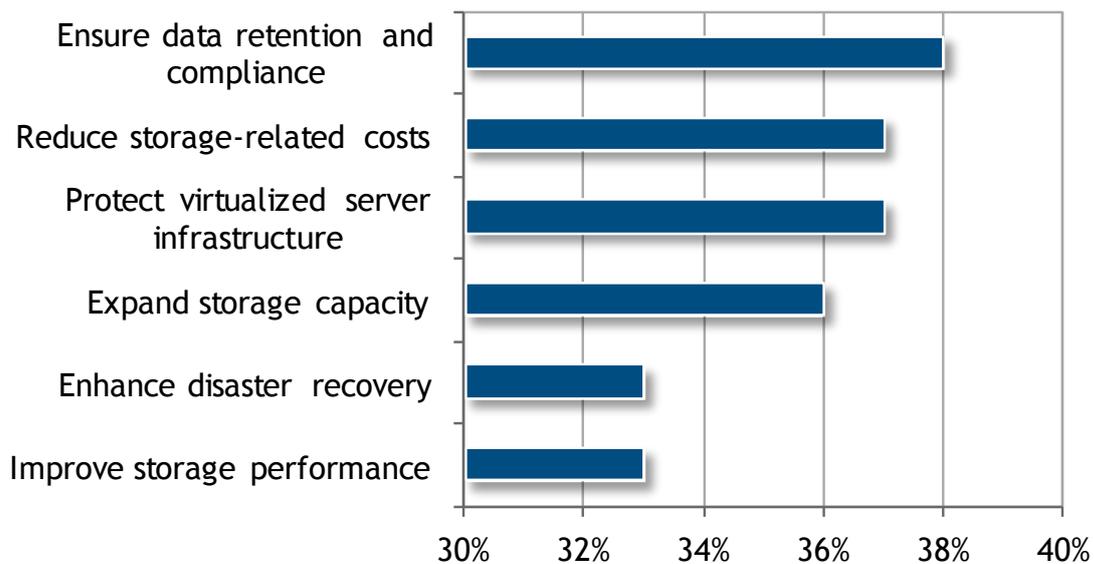
Note: n = 564

Source: IDC's *2014 European Storage Survey*

Periodic upgrades, equipment failures, capacity expansion, and new technology injection also present major challenges, since they severely interrupt today's "always on" business environment. It thus becomes necessary for any new architecture to allow portions of the infrastructure to be temporarily out-of-service while IT operations continue without interruption. Moreover, IT managers can no longer afford the disruption and expense to rip out and replace major parts of their storage infrastructure every few years to keep up with new technology.

SDS: THE NEW WAY TO TACKLE STORAGE CHALLENGES

SDS separates the advanced storage services from the hardware on which the data is stored, eliminating the hardware lock-in and rigidity associated with legacy designs.

The change is directly comparable to the virtualization of servers, where users can provision underlying compute resources as required and relocate virtual machines without concern for the failure and turnover in physical servers being deployed.

IDC defines SDS as follows (see *IDC's Worldwide Software-Defined Storage Taxonomy 2014*, IDC #247700, March 2014, for more detail):

> Software-defined storage (SDS) are platforms that deliver the full suite of storage services via a software stack that uses (but is not dependent on) commodity hardware built with off-the-shelf components.

The key characteristics of an SDS solution are that the solution:

- Does not require any proprietary hardware components

- Should be able to run on multiple (virtual and physical) hardware instances

- Is a standalone or autonomous system

Unfortunately, with many vendors introducing very narrow implementations of SDS, IT managers run the risk of creating isolated islands of SDS — one SDS product for virtual SANs, one tied to a specific hypervisor, another for flash devices, yet another for managing heterogeneous storage arrays, and so on. The benefits of SDS will only be reaped if the solution handles the entire storage estate from DRAM caches, to flash, to disk subsystems, to cloud, under one management regime.
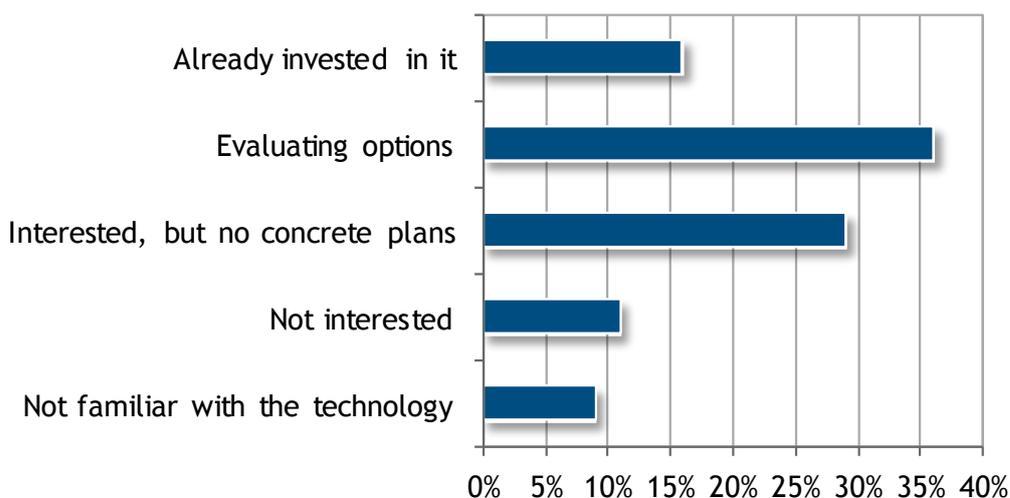
CURRENT ADOPTION OF SDS

IDC sees significant interest in SDS solutions throughout modern IT organizations, with good reason.

FIGURE 2

Current Adoption of Software-Defined Storage Technologies

Q. Which statement best describes your organization's interest in software-defined storage?

Note: n = 564

Source: IDC's *2014 European Storage Survey*

In IDC's recent 2014 European storage survey, 16% of respondents have already implemented an SDS solution, while 36% of respondents are currently evaluating SDS options and an additional 29% of respondents are interested in learning more about SDS. The pressure to reduce storage cost while expanding capacity and enhancing performance encourages IT managers to quickly become more knowledgeable on this novel new approach.
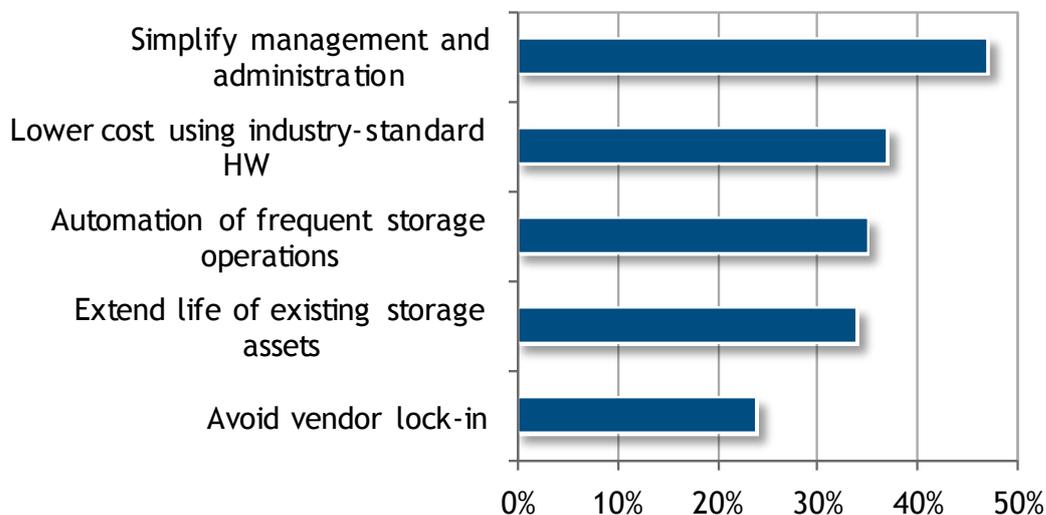
EXPECTED BENEFITS OF SDS

Figure 3 shows that improving management and administration of the storage infrastructure is among the top benefits expected from deploying SDS. Even though many IT managers used to believe that "storage is cheap" due to the continuous decline of the price per GB, they are now realizing that several other major cost drivers make storage painfully expensive, and a disproportionally high percentage of their IT spending.

They see SDS as a viable way to significantly reduce operational costs incurred from planned and unplanned downtime and the recurring management of their mushrooming storage estate, especially with diverse storage equipment and expensive flash storage use becoming commonplace.

FIGURE 3

Drivers of Software-Defined Storage Adoption

Q. What are the drivers behind migration to SDS? Please choose all that apply.

Note: n = 452

Source: IDC's *2014 European Storage Survey*

Automation of frequent storage operations is another expected benefit and a sorely needed feature for IT managers, as they are struggling with difficult and device-specific manual tasks in siloed storage infrastructures. SDS helps resolve this issue by providing a single software layer that can manage various different storage brands and models, and automate core storage operations through policy-based management.

DATACORE'S SDS STRATEGY

DataCore has been delivering on the vision of SDS – managing heterogeneous storage hardware from a storage virtualization software layer and utilizing commodity hardware – long before it was called SDS. Consequently, DataCore enjoys a 15+ year head start in this field, offering broad coverage, spanning server-attached storage, flash devices, SAN arrays, NAS, and cloud-based assets under its SANsymphony-V10 software platform.

DataCore layers a set of advanced storage services across the infrastructure, so that they become persistent, stable, and automated, irrespective of the comings and goings of the underlying storage hardware. This enables IT managers to upgrade storage hardware as needed and circumvent hardware and facility outages without interrupting IT service delivery.

DataCore uniformly controls how diverse storage resources are provisioned and protected as shareable virtual pools, dynamically matching workloads to the appropriate tier of storage. This effectively standardizes management across different models and generations of storage technology, while eliminating hardware lock-in. DataCore customers can pool the internal storage of application servers as well as their existing network-attached storage arrays in combination with low-cost standard x86 commodity hardware components.

One of DataCore's notable features is its ability to speed up the performance of applications through caching and auto-tiering across a diversity of disk and flash technologies from different vendors, enabling IT managers to provide faster performance without investing in additional or exotic storage hardware.

DATACORE TECHNOLOGY OVERVIEW

DataCore's flagship product is SANsymphony-V, a storage services platform that provides storage virtualization capabilities. It is used at more than 10,000 customer sites to accelerate the performance, achieve continuous availability, and gain optimal utilization from their IT infrastructure.

KEY DIFFERENTIATORS AND CAPABILITIES

SANsymphony-V is well adapted to today's IT challenges. The 10th iteration (SANsymphony-V10) delivers new enterprise-class virtual SAN capabilities, a comprehensive flash-optimizing software stack, and a number of additional enhancements:

- **Automation.** SANsymphony-V10 automates the provisioning and management of storage regardless of its location. It spans virtual SANs from server DAS, flash devices, networked storage (NAS), SAN arrays, and cloud storage under one management framework. This enables IT managers to consolidate point products (for example for virtual environments) under one comprehensive management regime, thus increasing operational efficiency.

- **Simple to deploy and scale.** Customers can start with a small virtual SAN deployment using the internal flash and disks of their application servers and can expand to cover various brands of storage arrays, converged systems, hypervisors, and flash technologies. Deployments range from a single virtual SAN starting with just 2 nodes, and scale out to

32 nodes; each node is capable of supporting well over a million IOPS and 1 petabyte of capacity. Therefore, virtual SANs can scale up to over 50 million IOPS and over 32PB of capacity.

- **Automated data placement.** SANsymphony-V10 automates the placement of data according to the performance requirements and cost profile of the application workload.

- **Automatic tiering capabilities.** With these capabilities, SANsymphony-V10 can place hot data close to the application in the flash memory and move it into networked storage or into the cloud when it is less frequently accessed. This capability helps customers to keep storage cost down while ensuring the required performance for critical workloads to deliver a great user experience.

- **Flash usage.** SANsymphony-V10 enables customers to take advantage of the emerging flash technologies and to integrate them into the existing storage infrastructure, where they can become one of the 15 possible storage tiers that it controls. The software adaptively caches read and write traffic and enables automatic failover protection to a mirrored copy of the data to prevent flash from becoming a single point of failure.

- **Seamless integration with popular server hypervisors.** SANsymphony-V10 provides plug-ins to enable customers to manage their storage estate from their preferred server virtualization management tools.

FUTURE OUTLOOK

IDC expects SDS to become the new standard for designing next-generation storage architectures as they solve the problem of rapidly storing, retrieving, and updating explosive data volumes and simultaneously lowering storage cost (both capex and opex) while preventing storage-related downtime.

SDS will enable organizations to take advantage of a wide variety of storage options, from the compute layer to flash to spinning disk, as well as several different interfaces, like block, file, object, and cloud-based storage. IDC is already seeing SDS employed in business-critical workloads among diverse datacenters.

SDS is a crucial component for IT managers who are striving to provide IT as a service. It enables them to maintain a seamless presentation layer of the storage infrastructure and to rapidly and effortlessly provision resources – including storage – from their datacenter automation software platform.

CHALLENGES AND OPPORTUNITIES FOR DATACORE

The biggest challenge for DataCore is the tendency for some customers to first consider point products provided by their incumbent storage hardware supplier or by their preferred server hypervisor vendor instead of opting for a comprehensive approach from the onset. However, those customers will soon realize the need to consolidate their isolated islands to achieve greater levels of operational efficiency and cost reduction. Starting small but thinking big from the onset is a best practice that IDC has observed. Many IT and storage managers start by implementing SDS for a specific project or part of their infrastructure. The successful ones choose an approach that enables them to roll out the SDS architecture throughout most if not all of their IT infrastructure over time.

The fact that many influential vendors are now promoting SDS creates an ideal opportunity for DataCore to capitalize on the demand. The storage virtualization market had for a long time been controlled by a few hardware vendors, leaving little room for software-centric companies to maneuver. With the move toward SDS, hardware-independent, software-based approaches like DataCore's are going to dominate the new storage landscape.

CONCLUSION

The transition to the 3rd Platform is rapidly transforming the IT environment of most companies. This has a huge impact on the requirements for more cost-effective yet high-performance storage. SDS represents a major and necessary shift in storage acquisition and operational practices to bring them in line with the attractive way that servers are now procured and managed.

One of the leading SDS vendors is DataCore. Its SANsymphony-V storage services platform is recognized globally with over 10,000 customers actively enjoying accelerated performance, continuous availability, and optimal resource utilization. DataCore has a proven solution, built on 15+ years of expertise in demanding datacenter scenarios. The company offers pre-sales and technical support to back it up. Indicative of its quality, it is notable that its large installed base is particularly well represented in Germany, where such attributes are required to compete successfully.

SDS is long-overdue given that speed, cost-effectiveness, flexibility, and resilience are now mandatory requirements. The urgency for change is palpable among IT managers eager to deliver IT-as-a-service and superior IT experiences to their users, be it on modern lines of business applications, virtual desktops, mobile devices, Big Data, or the cloud.

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