

## ESG Technology Showcase

# Software-defined Storage by Veritas

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**Abstract:** The days of enterprise storage technology being predominantly constrained to specific hardware configurations, such as the dual controller array, are long gone. The emergence of software-defined storage (SDS) has freed IT organizations to couple the desired storage software for their organizations with the desired hardware, helping to improve storage flexibility and manageability, and leading to reduced operational and capital storage expenditures. While SDS solutions open up the potential for improved storage capabilities, all SDS solutions are not created equal. One provider, Veritas, with its InfoScale Enterprise, delivers SDS capability with not only a solid complement of storage management capabilities, but also an added level of application-aware manageability.

## Overview

The emergence of software-defined storage (SDS) has been met with an incredible blend of confusion and excitement. With multiple storage providers leveraging SDS terminology in different ways, it is easy to understand the confusion. What is interesting, though, is that despite a limited consensus of the particulars of SDS, IT organizations still find the idea of separating the storage intelligence from the underlying hardware to be highly desirable. This was one of the multiple takeaways from ESG's next-generation storage research study conducted in the latter half of 2014.<sup>1</sup> ESG found that while there seems to be some fatigue with multiple vendors applying the term "software-defined" to almost anything, the benefits of SDS resonate on multiple levels. In other words, the pain of the old way of managing and storing data is becoming so great, that a promise to resolve these pains, even though the details may be unclear, is in high demand.

That being said, it is important to identify that different solutions and vendors use SDS terminology differently. Some vendors provide SDS solutions that look to virtualize heterogeneous traditional storage environments while others look to leverage commodity hardware in order to replace traditional storage arrays. While solutions that focus on virtualization of existing resources predominantly look to improve manageability and thereby save operational expenses, solutions that leverage commodity hardware and seek to replace traditional storage systems can offer a blend of benefits targeted to reduce both operational and capital expenses.

As with many new technology trends, this period of initial confusion will eventually give way to better understanding as more organizations evaluate and deploy SDS-based solutions. In time, IT organizations will have a better understanding of how SDS technical capabilities translate to benefits for their businesses and reduced expenditures. As mentioned previously, SDS offerings provide capabilities that can help free up IT budgets by reducing storage expenses. SDS is in itself a storage technology, however, it also opens up an additional opportunity to help better tailor the infrastructure environment to applications, resulting in some additional benefits.

Historically, until the emergence of SDS, storage functionality had been locked into hardware infrastructure, often delivered as external storage arrays. These arrays centralized storage functionality into a consolidated appliance serving

<sup>1</sup> Source: ESG Research Report, [Next-generation Storage Architectures](#), March 2015.

the storage needs of multiple hosts. This separation of data storage from the host helped to improve storage manageability and protection beyond the previous direct-attached storage, but also isolated the storage from the application to a degree. One of the additional benefits of SDS is that it allows storage to be provisioned faster, in line with application deployment, and, in some cases, locates storage on the same hardware as the applications, while providing many of the same ease-of-management and protection capabilities of external storage arrays. Abstraction via SDS can provide more than simple hardware optimization, it can shift IT focus to the application, where it arguably belongs.

Additionally, while much of the industry noise around SDS may be new, this does not mean that every vendor that delivers storage software is also new. Some vendors' solutions have a more established history and a greater level of experience than others. One such SDS provider is Veritas. With the introduction of Veritas InfoScale, Veritas has consolidated multiple existing and established SDS innovations into an integrated solution designed to help organizations better manage and control their storage infrastructure, as well as bring focus back to the application.

### **Increasing Focus on SDS**

In ESG's next-generation storage research study, participants expressed confusion around the details of SDS. Despite this confusion, however, the study found that a majority of those interviewed expressed that they were intrigued by, and positive about, the concept of SDS.<sup>2</sup> Most respondents saw value in SDS, mentioning perceived benefits such as: improved flexibility and agility, cost savings, improved scalability, and management simplification.

In 2015, ESG conducted a separate study leveraging a more quantitative approach that investigated general storage trends by surveying 373 IT decision makers (~70% from enterprises with more than 1,000 employees) responsible for their organizations' data storage infrastructures. In this study, ESG helped validate the earlier interest identified for SDS technology and found considerable support. When asked to describe their organization's perspective on SDS, a majority of respondents (68%) stated they were committed to SDS and either in the implementation (22%) or planning stage (46%). When asked to describe the factors responsible for interest in SDS, the largest numbers of respondents chose simplified storage management, reduced TCO, and reduced operational and capital expenditures.<sup>3</sup>

While early interest in SDS technology was often perceived as being sparked by the opportunity to leverage lower-cost hardware, the prominence of improved management, TCO, and operational savings in this study may suggest that organizations are starting to better understand some of the more holistic benefits of an SDS-based storage architecture.

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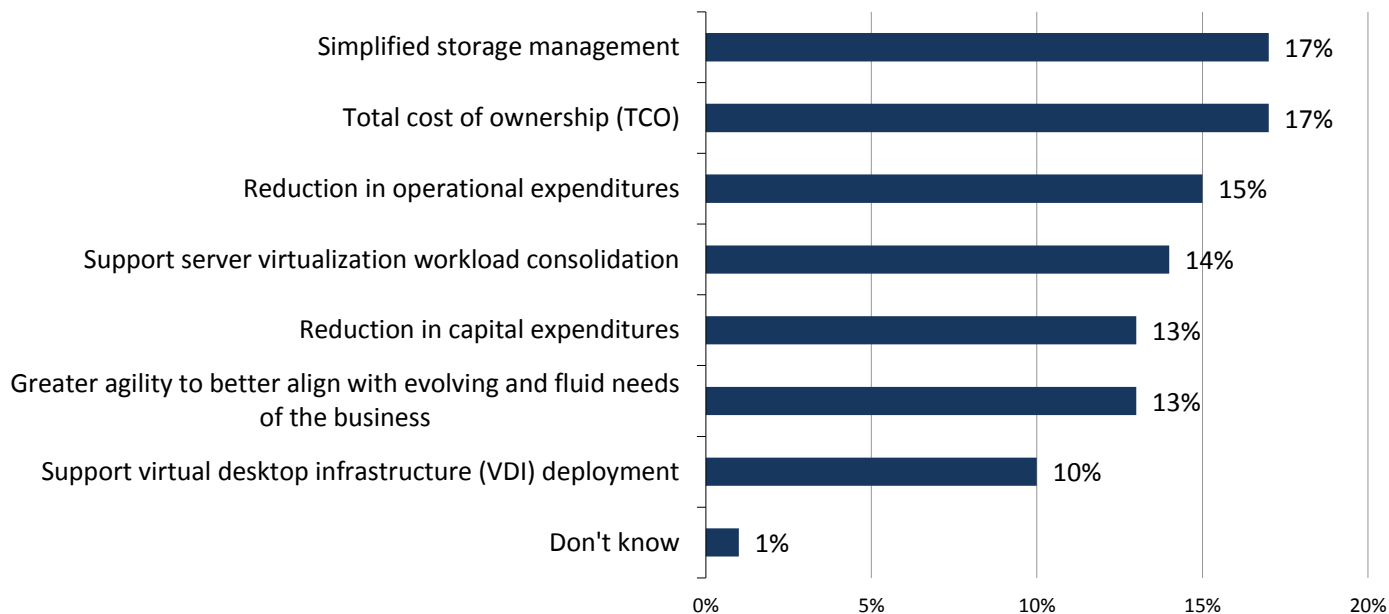
<sup>2</sup> Source: Ibid.

<sup>3</sup> Source: ESG Research Study, *2015 General Storage Trends Survey*, conducted in May 2015.

## Expected SDS Benefits

FIGURE 1. Most Important Factors Responsible for Consideration of Software-defined Storage

To the best of your knowledge, which of the following is the most important factor responsible for your organization's consideration of software-defined storage? (Percent of respondents, N=307)



Source: Enterprise Strategy Group, 2015

- Simplified Storage Management:** Hardware abstraction offered by SDS allows for a single storage instance to expand beyond a single hardware appliance or array. This can allow for the management of multiple heterogeneous storage nodes as a single larger pool. Additionally, many SDS implementations support multiple generations of hardware in the same solution, which eases the management of infrastructure during hardware generational upgrades. As mentioned earlier, SDS deployment flexibility allows for the potential for solutions to be better aligned with applications. In some cases, SDS technologies can move the data physically closer to the application. Some SDS solutions can tailor the storage deployment and resources more directly to the workload for improved efficiency, shifting the focus of the storage environment to center more on the workload and less on the infrastructure.
- Operational Expense Benefits:** The ability to reduce operational expenses can be tied most directly to the simplification of storage management, but the flexibility provided via SDS can offer some additional benefits as well. One to consider is the simplification of license management. With the ability to expand a single storage solution across multiple hardware devices and generations, product and feature licenses do not need to change with the hardware, reducing the number of licenses required to manage and the frequency with which those licenses need to be changed. Additionally, SDS technology provides the potential for greater deployment agility and faster storage provisioning, helping new applications and workloads to be deployed faster, and reducing the burden on often already overburdened IT resources.
- Capital Expenditure Benefits:** When the term SDS first started gaining traction, it was often associated with the opportunity to leverage commodity hardware. The idea is that by separating the storage technology from the hardware, IT organizations could select lower cost components. While that is true to some extent, additional

capital savings can be achieved with the ability to select and deploy not simply less expensive hardware, but the right hardware for the workload. Organizations can select to optimize cost, or performance, or a blend of both. Additionally as newer, faster, and more affordable technologies become available, SDS architectures can enable those technologies to be integrated into the solution as soon as they become available.

## InfoScale Enterprise: Software-defined Storage

Veritas has recently introduced Veritas InfoScale, its next-generation software-defined storage and application availability offering. While the name is new, much of the technology is not—InfoScale draws on Veritas' long heritage of innovation in these segments, with, according to Veritas, 74% of the Fortune 50 using Veritas Storage solutions. Based on technologies underpinning the earlier products such as Storage Foundation and Veritas Cluster Server, InfoScale offers a deployment model with a technology that has extensive experience storing and protecting data, enabling a more robust infrastructure. Veritas not only provides solid software-defined storage (enabling all the benefits that go with SDS), but also helps enable storage infrastructure to be better focused on the application. InfoScale provides several key capabilities:

- **Storage Capability as Software:** InfoScale offers heterogeneous hardware support with a shared-nothing architecture designed to support commodity hardware as well as a diverse range of storage arrays. This capability helps to reduce capital investment and increase deployment flexibility. Through flexible hardware support, InfoScale can simplify adoption of solid-state storage and thereby improve performance. InfoScale also offers a scale-out active/active design and supports multi-protocol data accessibility. By building on existing innovations, InfoScale is able to offer the key storage capabilities typically found in traditional rigid storage arrays including data migration across tiers, replication, snapshots, deduplication, and compression.
- **Application-focused Caching Delivering Quality of Service:** InfoScale endeavors to tie storage management to the application, where it arguably belongs. In support, InfoScale offers SmartIO application level caching with secure quality of service (QoS) capability. SmartIO moves reads and writes inside the server, preserving performance for mission-critical applications. Additionally, SmartIO offers multiple caching options, read and writeback, in both single-node and multi-node solution deployment configurations. To ensure data coherence and performance in the event of hardware outage, InfoScale offers an innovation called cache reflection. Cached data is persistent across a server reboot, which can help bring applications back to their optimal states in a shorter period of time. SmartIO accomplishes these benefits through transparent application integration combined with advanced caching heuristics. The net result allows the SmartIO technology in InfoScale to target the most relevant and most critical data, based on access patterns and optimizing storage performance to the demands of the application.
- **Dynamic Scaling and Storage:** InfoScale provides a single storage pool designed from multiple independent nodes, leveraging commodity hardware to help keep costs in check. The ability to pool multiple devices together can simplify storage management and help achieve more efficient data optimization with deduplication and compression across all the nodes in the pool. Additionally, InfoScale allows for multiple generations of hardware in the same storage pool, eliminating the need for forklift upgrades. Architected with dynamic multi-pathing, InfoScale can improve performance and resiliency by spreading data access across multiple paths to multiple storage nodes.

While there are numerous potential benefits for SDS, one potential challenge introduced by hardware flexibility, the risk of hardware integration, is commonly mentioned by detractors of SDS. In traditional storage array architectures, the software is designed for a specific hardware configuration, then tested and validated with that intended hardware architecture. The responsibility for integration resides with the storage provider. With SDS solutions, however, the IT organization can select the hardware infrastructure. Despite being often referred to as commodity, different hardware products can introduce

minor variations that impact interoperability, e.g., different firmware revisions or different manufacturers. Qualification takes time and in some cases new software can take time to mature. Veritas, however, has an advantage in this case. InfoScale is not an entirely new offering. It is based on long-established products such as Storage Foundation. And Veritas is by no means a new software company. Veritas has worked with partners for years to qualify and support a multitude of heterogeneous hardware environments and delivers a proven SDS technology.

## The Bigger Truth

While the IT industry is still at the forefront of SDS adoption, ESG's research reveals a significant level of interest emerging. As organizations look to investigate SDS solutions, it is important to remember that even though the term software-defined storage and industry hype are still relatively new, some SDS products and architectures have been around longer than others. These experienced SDS architectures, such as InfoScale from Veritas, enjoy longer histories of supporting heterogeneous hardware environments and ensuring data resiliency. Additionally, new technologies can sometimes introduce feature and functionality tradeoffs until the solution matures. InfoScale offers a complement of key storage features such as data migration across tiers, replication, snapshots, deduplication, and compression with advanced caching and QoS capabilities. These capabilities come in addition to, not in conflict with, an SDS architecture. As such, InfoScale's heterogeneous flexible hardware support can help control the costs of storage, while continuing to provide the storage features expected in traditional arrays.

In the wake of increased data growth, the status quo of the traditional storage silo is becoming unsustainable. InfoScale represents an alternative proven SDS solution, combining application-level control with commodity hardware affordability. The end result is a storage solution poised to provide the gamut of expected SDS benefits, such as reduction in capital expenditures and manageability improvement, while being delivered from a provider with a solid history in enterprise software.

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