



WHITE PAPER

Redefining the Economics of Storage

Sponsored by: Dell

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IDC OPINION

In October 2012, IDC published a business value research paper on the financial benefits for users that converted from legacy to Dell storage arrays. Ten companies in the United States and Western Europe were interviewed in depth to discover the impact on infrastructure costs, administrative overhead, and user productivity. The results were aggregated to provide an average return on investment (ROI) and payback period for the sample. IDC has therefore proved that Dell's approach to storage offers a material financial advantage for users. On average, the break-even payback point was reached six months after deployment, with an average return on investment of nearly 400%.

Since that time, there have been many changes both for Dell and for the wider IT industry. Dell is once again a private company with a palpable sense of energy, confidence, and ambition in the many new technology and service announcements that have been made in 2014. Dell's storage technology has also progressed, particularly around the company's vision to democratize flash so that significant performance improvements are available to the broad market at realistic price points. IDC is currently refreshing the Dell project to reflect the additional benefits from flash storage.

The demands on IT managers are changing, arguably more quickly than ever before. As we move further into the era of 3rd Platform IT, users are faced with an unprecedented choice of deployment and management models but may struggle to make choices if there is insufficient evidence of the commercial risk and reward. IDC research shows that many companies struggle with storage infrastructure that is demanding to manage, inflexible to changing demands on performance, and expensive to purchase, upgrade, and maintain. For companies wishing to exploit the benefits of the 3rd Platform, such characteristics are a strategic obstacle and must be overcome.

IDC believes that Dell's automated data management, extended product life span, remote management services, and approach to storage licensing charges combine to form a uniquely differentiated proposition. IDC business value research has proved that the consolidation, the standardization, and the automation capability of Dell storage deliver a significant financial advantage over legacy storage arrays.

IN THIS WHITE PAPER

This white paper assesses Dell's storage and services vision and the company's ability to meet market demands. IDC highlights the priorities and challenges faced by IT managers looking for midrange and high-end open systems storage solutions and presents the new and innovative solutions Dell has come forth with to help solve those challenges. IDC also investigates how focusing on business initiatives, as opposed to the mundane task of supporting and managing that environment, is key to driving innovation and the business forward. Dell has created service offerings that free IT staff from day-to-day tasks, enabling them to take on more pressing business initiatives.

This white paper contains the following sections:

- Situation Overview
- Dell Storage Strategy Overview
- Dell Storage Portfolio Overview
- Future Outlook
- Challenges/Opportunities
- Conclusion

SITUATION OVERVIEW

Driving a Step Change in Storage Agility

IDC finds that the most successful storage investment projects commonly include the following three elements.

- **Consolidate:** Disparate or fragmented storage architectures are consolidated so that management effort is focused on fewer physical devices.
- **Standardize:** A limited set of hardware platforms and management tools are deployed, and administrative processes are established.
- **Automate:** Storage management and data protection tasks are automated wherever practicable.

"Consolidate, Standardize, Automate" is a useful yardstick for assessing the potential impact of a new storage solution. For example, let's consider a standalone all-flash array as a potential solution to an I/O bottleneck. Let's also assume the vendor is new to the site.

- **Consolidation?** Potentially yes, if the performance boost allows support for more servers or workloads.
- **Standardization?** Probably not, as it introduces a new user interface and a set of management processes. Adding a new vendor reduces the ability to standardize on a limited set of physical components and will add complexity to the service arrangements.
- **Automation?** Probably not, as hot data may need to be migrated manually to the array and the scope of existing automated processes will be reduced.

On this basis, the benefits of increased I/O performance will be offset or negated by the increase in complexity and management overhead. A flash solution that delivers the performance boost while maintaining existing management processes would be preferable. Wherever possible, storage solutions that deliver tangible improvement in all three areas should be chosen.

"Consolidate, Standardize, Automate" is an effective mantra for IT managers looking to drive efficiency and capability.

DELL STORAGE STRATEGY OVERVIEW

Dell is progressing through three major stages as it builds out its storage vision: acquire, integrate, and accelerate. Through each stage, Dell considers it vitally important that existing customers benefit from each development and are not left behind.

Acquire

Dell's storage business is built around five major acquisitions:

- **EqualLogic:** Low to midrange iSCSI primary storage
- **Compellent:** Midrange to high-end FC/iSCSI primary storage
- **RNA:** Shared server-side flash, now integrated as Fluid Cache for SAN
- **Exanet:** Now integrated as Fluid File System
- **Ocarina:** Compression and deduplication, now integrated into Compellent and EqualLogic product lines

Base storage IP acquisitions are now considered complete.

Integrate

The RNA, Ocarina, and Exanet technologies are now integrated into the portfolio, and the brand names are no longer used. To complete the integration stage, Dell will evolve to a single platform that combines EqualLogic and Compellent platforms into a single storage architecture. Those sub-brands will then be retired and replaced by Dell storage.

Accelerate

With a single storage architecture, Dell can focus its development resources such that new innovations can be brought to market more quickly and to the benefit of more users. Planned road map developments include:

- Common management tools across all units
- Replication between EqualLogic and Compellent platforms
- Automated orchestration

- QoS tools
- Software-defined abstraction
- Unified scale-up/out architecture

These developments are key evolutionary steps in the path toward the hyper-converged, software-defined datacenter (SDDC) that Dell is working to create. However, a key tenet for Dell is to protect the investment of existing EqualLogic and Compellent users, such that companies can migrate from legacy to the newest platforms at their own pace. Therefore, Dell's strategy includes both revolutionary and evolutionary options, allowing customers to deploy whatever approach is best for their workload mix or environment. The "revolutionary" approach is characterized by software-defined storage (SDS), with the forthcoming Dell XC Web-Scale Converged Appliances products being developed in conjunction with Nutanix software serving as a prime example.

Software Defined: "Project Blue Thunder"

IDC believes that software-defined storage will become the future standard model for on-prem storage acquisition, and Dell has embraced the concept with enthusiasm (see Figure 1). As a major vendor of general-purpose hardware, Dell stands to benefit greatly as storage moves away from the proprietary appliance model.

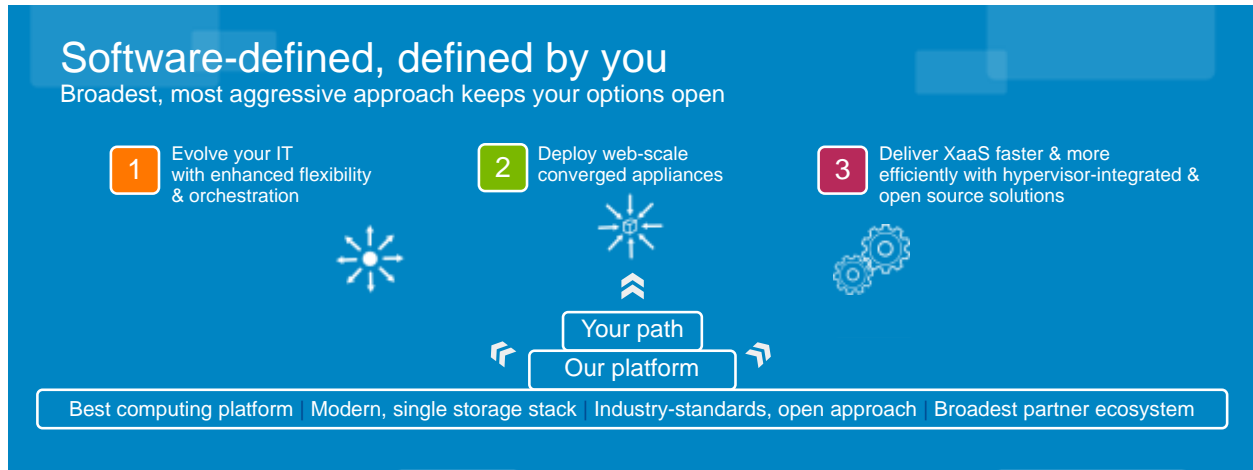
Dell's message here is simple: "Your path, our platform." The company has partnerships with key ISVs in the software-defined market: Nutanix, VMware (VSAN), Microsoft (Storage Spaces), Nexenta (primary and secondary storage), Ceph (object storage), Cloudera and Hadoop (analytics), Red Hat, Caringo, and others. Dell will offer end-to-end solution architectures, bundled or integrated, with enterprise-class support, optimized hardware, and monitoring that customers can buy as a single SKU.

Dell's intention is to combine market-leading storage software, including open source, with the company's enterprise-class hardware and services. Dell intends to dramatically simplify and de-risk storage acquisition while delivering a step-change reduction in the cost of ownership.

Dell also wants to simplify, accelerate, and de-risk the path to hyper-converged infrastructure. Dell is partnering with Nutanix to bring Dell-branded, Dell-supported, Dell-installed Web-scale hyper-converged platforms to market. There will be bundles for multiple virtualized workload types, aimed at midsize to large companies and branch offices. Dell will also offer a simple, scalable VDI solution.

FIGURE 1

Dell Storage Flexibility



Source: Dell, 2014

The Dell storage portfolio has expanded rapidly allowing customers to meet specific workload and price/performance requirements while mitigating risk through enterprise support services. Customers can buy storage solutions based on third-party storage software such as VMware VSAN, Microsoft Storage Spaces, OpenStack Ceph, NexentaStor, and Caringo, installed on Dell hardware platforms, with Dell support contracts for the complete solution.

The company is offering approved, workload-specific reference configurations with full support to drive the highest levels of performance, agility, efficiency, and cost-effectiveness. Dell's renowned support services mean that the customer is covered for the complete storage solution, just as with conventional appliance-based systems.

From the user perspective, Dell's enterprise storage strategy can be characterized by the following objectives:

- Take enterprise-class levels of performance, availability, and service support and deliver them at price points acceptable to the broad mainstream market. Dell's single management interface across the portfolio is sharply different from another leading vendor offering multiple incompatible platforms.
- Embrace software-defined storage and offer a range of open standards SDS solution types. This differs from another leading vendor that has a complex and proprietary product that is positioned as an over-arching management layer that supports a limited range of third-party arrays.
- Change flash from being a high-cost niche solution and democratize it for the broad market. This is exemplified in the "flash for the price of disk" promotion that has made flash accessible to mainstream users.
- Offer a complete end-to-end solution design, integration, and deployment service.

- Acquire best-of-breed storage technology but integrate it with in-house IP such that extra benefits are delivered without additional management overhead. An example is RNA, which was fully integrated into the Dell Storage Center platform and launched as Fluid Cache for SAN. The user gets the benefit of server-side flash performance, yet the normal SC management and automation capabilities are unchanged.
- Offer high-touch remote storage support services to the mass market. This approach came through the acquisition of Compellent, which operated a highly acclaimed support service known as Copilot. Dell users have repeatedly praised the Copilot service to IDC analysts. Dell has invested to leverage and extend this level of premium service to support Dell PS Series products via its ProSupport Plus offering.
- Demonstrate a strong commitment to change the economics of storage as exemplified by a unique approach to licensing, eliminating forklift upgrades, automated data placement, and high levels of support when needed. IDC has validated this approach in a business value research paper. Dell's positive view of SDS will drive future enhancements in this area.

DELL STORAGE PORTFOLIO OVERVIEW

The business value of Dell's storage platforms is delivered in three ways: provide better efficiency, increase IT agility, and achieve operational resiliency. Efficiency is provided through eliminating excessive license fees and forklift upgrades while requiring less hardware to buy and manage. Agility is increased by reducing time-to-provision and automatically freeing up resources to support business innovation, and operational resiliency is achieved with exceptional availability and integrated data protection.

Dell PS Series Storage (Formerly called EqualLogic)

Dell's PS Series of storage systems is designed to offer a cost-effective, seamlessly scalable, and effortless Ethernet-networked storage platform for growing virtual and mixed server environments. Its low-entry point and scale-out architecture enables customers to buy only what they need and expand later with ease but without disruption. A Dell PS Series SAN can start with one array and be scaled out to a cluster (called a group) containing up to 16 arrays. Multiple generations of arrays with different capabilities can be combined in a group. This allows for mixing storage with various performance and capacity points to match workload needs and provides investment protection for existing equipment as well as seamless upgrades to new generations of equipment.

Built-in automated management capabilities, like autonomous load balancing, dynamic tiering, and automated setup for new LUNs, and an easy-to-use interface lower the administrative overhead associated with legacy storage systems, freeing up valuable time for IT staff. As an IP specialist storage platform, Dell PS Series products support both iSCSI SAN and CIFS/NFS NAS access for unified storage management and storage systems consolidation. All-inclusive pricing for all the data management features, like snapshots or replication, dramatically improves overall TCO, making budget planning simpler and predictable by eliminating unforeseen licensing costs.

Dell SC Series Storage (Formerly called Compellent)

Dell SC Series storage is Dell's enterprisewide storage infrastructure, serving all Fiber Channel, IP SAN, and NAS needs for unified storage management. A Dell SC Series array can scale up to create a large pool of storage managed by a single self-optimizing system. Multiple systems can create a storage grid in the datacenter with live volume migration to support VM motion, fully transparent to the hosts and applications.

In addition, all Dell SC Series systems can be monitored and managed from a single pane of glass, but the deep integration with virtualization, systems management, and orchestration with vendors ensures that management overheads associated with storage provisioning are kept to a minimum.

A grid infrastructure can span across multiple Dell SC Series generations, ensuring investment protection and non-disruptive expansion. According to Dell, over 90% of all SC systems ever shipped are still in use. Built-in enterprise-class data protection capabilities like pointer-based snapshots and remote replication, coupled with Dell's proactive remote technical support, allow for peace of mind even for the most mission-critical business applications.

Dell Storage Center 6.5 firmware enables the SC array to migrate hot data to flash storage installed on the server's PCIe bus, bringing the data closer to the workload and dramatically reducing latency. Dell has demonstrated a Fluid Cache for SAN configuration with a 5 million IOPS capability. While the performance is impressive, it is achieved using the standard SC environment so that management complexity is not increased. Data is compressed in real time, further driving down the cost per gigabyte. At the time this white paper was written, there is no other storage platform available that can combine 5 million IOPS with <\$1 per gigabyte in a single namespace.

Dell Service Offerings for Storage

Over the past two years, IDC has interviewed Dell storage users in depth to understand the impact of the solution and to quantify the business value. At the end of the interview, we usually ask what is the single thing about Dell storage that they like the most. Almost always, the reply is "Dell Copilot support," followed by an anecdote about how useful the service is, even though the hardware is highly reliable. Based on this, IDC believes that Dell is delivering an exceptional level of remote management support that almost equates to having a dedicated, fully trained, 24 x 7 storage administrator.

Enterprise IT must focus on business and process automation and move away from the day-to-day task of supporting and managing storage and systems. Dell has established an extensive portfolio of enterprise service offerings, which include storage consulting and deployment as well as premium support. To that end, Dell offers Copilot and Optimize for its Dell SC Series of products and the Copilot-inspired ProSupport Plus for its Dell PS Series offerings. Dell support offerings provide automated monitoring and reporting capabilities (PhoneHome for Copilot and SupportAssist for ProSupport Plus) that can free your IT department from mundane tasks. With the proactive maintenance provided from Dell Copilot with Optimize and ProSupport Plus, customers will benefit in a number of ways:

- Dell technicians are aware of issues often before the client realizes there is a problem. With sophisticated tools, Copilot is able to review and gather data to provide system recommendations and proactively resolve issues before they become problems.

- Elite engineers will troubleshoot hardware/software in an efficient manner to keep mission-critical assets up and running and will provide technicians on a 24 x 7 basis with parts replacement on an SLA basis to resolve hardware issues when they occur.
- The Copilot support team will provide an in-depth analysis of your current storage environment and support needs and provide best practice recommendations to make the most of your IT investment. They will also provide strategic planning for the future growth of your datacenter and storage needs.
- Performance tuning helps optimize your storage so mission-critical workloads run at peak performance and efficiency.
- Custom reporting, trend analysis, and capacity and log review with expert support team members ensure your systems are properly patched seamlessly with the latest firmware and software revisions.

IDC has spoken with many Dell storage customers, and again and again the use of Copilot and other support offerings was cited as one of the major reasons they continue to utilize Dell products and services in their enterprise IT environment.

The IT industry is shifting to a new technology platform for growth and innovation. IDC calls it the 3rd Platform, built on mobile devices and apps, cloud services, mobile broadband networks, big data/analytics, and social technologies. Millions of users are connected to each other through mobile broadband with access to millions of applications and cloud services, which is contributing to the continuing exponential growth of data. IDC projects that the digital universe will reach 40ZB by 2020, exceeding all previous forecasts. IDC believes that only 0.5% of the world's data is actually being analyzed, hence the importance of technology and talent to extract the hidden value from big data. The enterprise storage systems market grew from 7.3EB in 2009 to 20.5EB in 2012. Driving the tremendous storage growth are the following macro-level drivers:

- **Cloud computing.** This is a new delivery and service model that will shape IT spending over the next several decades. It entails shared access to virtualized resources over the Internet. Public IT cloud services spending will reach \$47.4 billion in 2014 and nearly \$108 billion in 2018, with a five-year compound annual growth rate (CAGR) of 23.5% – five times the growth of the IT industry as a whole. These services will drive 17% of IT product spend by 2017, up from 8% in 2012.
- **Mobile devices.** The "bring your own device" (BYOD) trend has been growing rapidly in the corporate sector, such that many workers now have two or more mobile devices to access the corporate network. Access to software functions "as a service" that were once available only through licensed software deployed in the datacenter will continue to fuel public cloud services and storage capacity.
- **Big data with real-time analytics.** Information overload and the time and cost of finding the right information are significant issues for many organizations. These factors present an opportunity that can be addressed with big data platforms that enable nearly continuous real-time analysis of data from a wide variety of sources. This new opportunity will drive new partnerships and specialized solutions into the market.
- **Machine-generated data.** The information output from machines and sensors and to some extent what IDC is defining as the Internet of Things (IoT) is now aggregated to process an even higher level of information and analytics, further driving exponential growth. IDC forecasts that machine-generated data will grow from 24% of the digital universe in 2014 to over 40% of the 40ZB that will be created in total in 2020.

- **Social media.** The growth of services such as Twitter, LinkedIn, and Facebook can easily connect people and create new content that can be shared within a defined group or beyond. The volume of data created by social media is substantial and combined with the frequency of creation will challenge IT systems trying to unlock additional value.

While the amount of data to be stored continues to grow, IT organizations' storage budgets do not increase proportionally with the growing need for storage space. Limited datacenter space, power and cooling, growing operational costs, and data management complexity create additional pressure for providers to look for more efficient ways of using their existing storage assets.

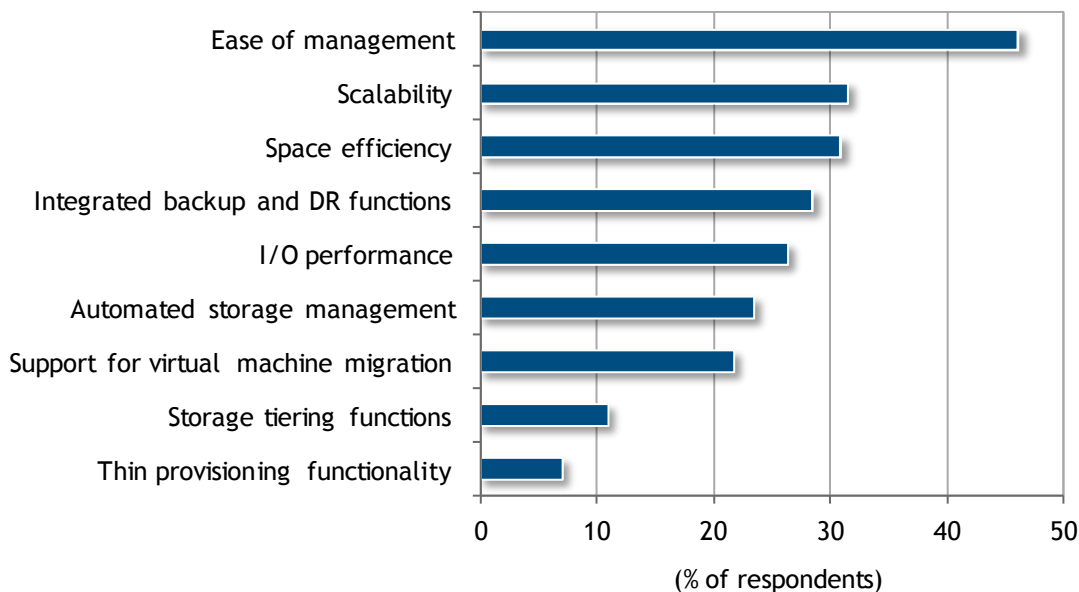
Today's Storage User Requirements

Burgeoning levels of complexity are a common challenge in the datacenter. Therefore, ease of management is frequently cited as the most desirable characteristic when choosing new storage infrastructure (see Figure 2). Other features such as DR and data protection as well as scalability were also highlighted as top challenges. Many IT managers are also grappling with overly complex and disparate infrastructure, a multitude of incompatible management processes, and too little automation of the most repetitive tasks. Fewer companies today can justify the additional expense of specialist storage administrators and would prefer that a generalist could manage and maintain the storage effectively.

FIGURE 2

Top Storage Infrastructure Requirement Challenges

Q. What are the top 3 challenges for your company regarding storage infrastructure requirements?



n = 500

Source: IDC, 2014

Legacy Storage Systems: Part of the Problem?

In the near future, the management, protection, organization, and continuous mining of large yet diverse data pools will replace basic device configuration and backup, becoming the primary tasks for storage administrators in corporate datacenters. They will need to deploy a growing array of data assets optimized for different use cases:

- I/O-oriented SAN storage systems that make use of flash storage to support high-transaction volumes
- Intelligent storage systems that provide advanced storage virtualization and data protection/efficiency functions in support of large virtualized server pools
- Scale-out NAS storage systems that reduce the infrastructure and operational costs associated with capturing and serving expanding pools of rich content
- Archive storage systems that consolidate, organize, and preserve critical digital assets for reduction of corporate risk (data governance and ediscovery) and better long-term exploitation through analytics

These diverse needs carry a risk for the IT organization, however. It often appears easier to deploy multiple storage systems (often from different suppliers) to address each requirement on a case-by-case basis. However, the unintended consequences of such an approach may include:

- Inefficient use of diverse storage assets that can't be easily reallocated to meet changing needs
- Multiple data management and protection processes that decrease admin efficiency and reduce flexibility to meet new requirements
- Duplication of storage staff training and thinly stretched staff resources to learn/support/manage incompatible systems

Such technical and organizational challenges also mean that data migration and protection within an individual datacenter and across multiple datacenters create significant business costs that should be avoided. This physical asset migration burden also prevents organizations from quickly capitalizing on new technologies.

IT Complexity and the Impact on Support

For datacenters, the advent of virtualization has caused a large movement toward storage consolidation. As a result, datacenters have become denser, which in turn has led to complex storage topologies. With today's technology, datacenters should focus on implementing advanced tools and automation, which are embedded in these new storage systems, and incorporate some of these features within existing infrastructures. Integrating these new capabilities into an organization's support infrastructure is key to understanding the larger picture of the business impact when issues do arise.

As IT managers and CIOs are tasked to move toward more advanced storage infrastructures, they face more pressure to deliver an effective solution they can support. Cloud and virtualized infrastructures bring a whole new complexity to an already diverse environment. Datacenters already have a myriad of applications, hardware, and middleware providers, and some other top-of-mind areas of concern around the support of all these technologies are:

- **Time to resolution.** This continues to be an area of focus for most IT organizations facing issues in their IT environments. IT managers have critical SLAs with internal and external customers that must be met.
- **Security risks.** Remote support access is still *perceived* as an area of vulnerability. Automation tools that extend outside a customer's datacenter have perceived risks as an open door to intruder attacks.
- **Inventory data.** Lack of access to up-to-date contract management and inventory data leads to the inability to check entitlement and support coverage. Consequently, most IT organizations continue to struggle with ensuring that all assets are properly covered.
- **Patch and firmware management.** This involves reducing the amount of time spent coordinating, deploying, and verifying patches and upgrades and requires a well-thought-out methodology for keeping systems up to date.
- **Identifying key contacts.** This involves knowing who to contact when problems occur and the best way to engage support providers. Since most enterprises are managing heterogeneous environments with multiple layers of technology providers, coordinating support can pose significant issues. Isolating and diagnosing potential issues can be a back-and-forth nightmare with support providers. Customers are typically caught in the middle as referees and are left frustrated with the lack of attention to the actual issue at hand.
- **Legacy support.** Lack of support tools for legacy systems or the complexity of getting these legacy systems onto a robust management platform is an area of concern.

Forward-looking organizations like Dell are assessing innovative storage systems engineered to help reduce time to resolution, overall risks, and downtime in enterprise environments.

Benefits of Proactive Support

Enterprises are asking IT departments to manage ongoing operations with fewer resources; IT managers are starting to look to support providers for assistance in improving overall performance while reducing and improving resource allocation in the IT environment. In a recent 2012 IDC survey, only 18% of respondents stated that they wanted to support their storage environments themselves, hence support providers have responded by altering packages and features to include new tools and utilities to help address the most pressing management and support issues. By engaging with a support services provider that offers robust tools and proactive capabilities, IT departments can achieve the following benefits:

- Getting a holistic view into the entire datacenter, not just storage but power and cooling, servers, and networking (This includes inventory management and the entitlement on those assets as to how they are covered under a support contract.)
- Automated support and notification – the ability to see and manage tickets and the escalation process anytime from anywhere

- A single point of contact for issues that do arise – they will have knowledge of your storage infrastructure and business process
- The ability to understand the business impact of storage problems and prioritizing IT efforts based on business risk
- The ability to proactively fix problems before they impact users (phone home abilities with engineers that can help with patching and updates)

Enterprises are looking for ongoing management, support, and tools and automation that specifically focus on preventing storage issues and/or decrease time to resolution when problems occur. In addition, IT organizations will also expect vendors to make significant investments in the tools and processes that can maximize performance and efficiencies of these arrays. Further, the ability to accommodate an increasingly mobile and remote workforce while delivering a high-quality, consistent service experience will be invaluable. When implemented, Dell Copilot and Dell's portfolio of technical services will help customers attain these goals.

FUTURE OUTLOOK

Major storage vendors including Dell have announced support for software-defined storage, which differs from the conventional industry practice of delivering a complete hardware and software-based storage appliance. It is an approach in which the software that controls the storage-related tasks is decoupled from the physical storage hardware.

SDS puts emphasis on storage services, such as snapshots or deduplication, rather than on the storage hardware. For example, a storage administrator can use service levels when deciding how to provision storage and not have to think about hardware attributes. Storage can, in effect, become a shared pool that runs on standard hardware. In turn, decoupling of storage hardware changes the way that a storage system is acquired and deployed. The user or integrator is no longer obliged to purchase disks and enclosures from the storage vendor but is free to choose HDDs and SSDs from off-the-shelf suppliers.

This approach has grown steadily in popularity over recent years – to the extent that a major structural shift in the storage market is now underway. IDC believes that over time, the SDS market will become the de facto mechanism for designing, delivering, and consuming data. The file- and object-based storage market is forecast to reach upward of \$34 billion in 2016; IDC expects more than two-thirds of that will be made of scale-out software-based storage platforms. Dell is already positioning itself to exploit this trend. SDS is part of a larger industry trend that includes software-defined networking (SDN) and software-defined datacenters. Reducing the cost of storage is the top priority for large companies planning their storage investments. SDS has the potential to bring about the required reduction in cost while enhancing manageability, flexibility, and performance. To maximize the benefit of this structural shift, it will be helpful for the user to have an understanding of the underlying storage elements and their characteristics and optimal use cases.

Some storage vendors will be reluctant to promote SDS solutions that undermine their established appliance business. However, Dell is a major vendor of the general-purpose servers and enclosures used in SDS solutions, so it has embraced SDS as a growth opportunity. IDC believes that SDS is a structural shift that will deliver storage with the flexibility and cost-effectiveness that is now seen with x86 servers and that Dell is well placed to take advantage.

CHALLENGES/OPPORTUNITIES

- **Awareness.** In IDC's view, Dell's principle challenge in storage is one of awareness. While the company is well known and respected for its server and client business, the company's progress in other areas such as storage is less widespread. Many Dell storage users interviewed by IDC appear to have "stumbled" upon Dell after poor experiences with other vendors. The company's service capability is also underestimated, despite global success in particularly demanding sectors such as healthcare.
- **VAR coverage.** Dell is a relatively new participant in indirect storage sales with partners. Although the company has thousands of partners, it has low penetration into the storage specialist VARs and integrators that drive a significant proportion of the upper-midmarket and high-end storage business. This is recognized within the company, and initiatives are underway that will seek to broaden reach and coverage.
- **Competition.** In Dell's corporate culture, engineering excellence and technical innovation are of the utmost importance. Flashy marketing is generally seen as a lower priority. Yet in today's confused storage market, vendors that shout the loudest can win attention from buyers. New market entrants, often backed by significant venture capital, are in a hurry to win deals and build awareness. The clear risk for Dell is that it will be out-marketed by smaller and louder competitors that seek to negate or neutralize its commercial and technical edge.
- **High-end storage market.** The high-end storage market (\$250,000+ ASP) grew steadily through 2013 but is now showing signs of weakness as buyers become more open to consider high-performance, flash-enhanced variants of midmarket arrays. High-end buyers have among the most stringent requirements for support, availability, and consistency of performance.

CONCLUSION

The storage market today is arguably changing more rapidly than at any other time in its history. New market entrants with innovative architectures are working to subvert the incumbent vendors that in turn are accelerating their development cycles to keep up with new advances. Software-defined storage is moving closer to mainstream adoption, with fundamental implications for the vendors and users alike.

Flash-based storage systems and SSDs have been deployed in enterprises for many years in environments that demanded the best performance regardless of the cost. However, IDC believes that because of the declining cost of NAND flash media and system-level advancements, solid state technology will become pervasive across the enterprise and complement existing storage systems. Today's business and technology leaders should look to solution providers like Dell that offer a comprehensive portfolio to meet diverse enterprise workloads and those that have a strategic framework to help customers determine the optimal storage solution for their specific needs.

About IDC

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