

Solution Showcase

Dell EMC All Flash Isilon: Seamlessly Transition to the All-flash Data Center

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Abstract: The all-flash data center reality is closer than you think. While perceptions persist that solid-state (or flash) storage is suited solely for high performance transactional workloads, the fact is that recent cost declines have made the benefits of flash more available than ever before. At the same time, unstructured data sets, which have historically leveraged performance-based infrastructure to a lesser extent, are increasingly demanding lower latency technology as a means to drive faster business outcomes. Forecasting the intersection of these two trends is Dell EMC, recently releasing the All Flash Isilon, which delivers low cost, high density flash storage combined with enterprise-level scale-out file storage capabilities.

Overview

The dependence of modern digital IT infrastructure upon mechanical spinning disk components has been something of an oddity that the industry has accepted for years out of necessity. With the emergence of flash storage, this dependence, which has held back the potential of IT infrastructure for years, is now being removed. As a result, IT organizations are enjoying a wealth of benefits helping them keep pace with the ever-increasing demands being placed on the data sets that they store and manage.

While the performance advantages of flash storage are well known, the impact that flash storage has on the surrounding data center ecosystem is possibly more profound. By eliminating the data storage component as the performance bottleneck, the remaining ecosystem elements spend less time waiting for the data storage to respond. Reducing wait times enables the applications, servers, and network all to become more efficient. This increase to overall efficiency reduces spending on other IT ecosystem components (such as server hardware or software licenses) while achieving the same performance, further reducing the total cost of ownership (TCO) of managing the data center. While these TCO benefits often make flash storage beneficial even at a price premium, the industry has enjoyed a substantial decline in flash storage prices recently. As flash storage becomes more obtainable, businesses are finding new opportunities for high performance data access. For example, in an ESG research investigation into general storage industry trends, business intelligence and data analytics was identified by respondents as the application or workload expected to be most responsible for their organizations' storage growth over the next 24 months.¹ Furthering this example, the ability to garner near real time insights from unstructured data sets with business intelligence or big data analytics necessitates the performance of all-flash technology, but also requires a system designed specifically for the needs of unstructured data.

¹ Source: ESG Research Report, [2015 Data Storage Market Trends](#), October 2015. All ESG research references in this solution showcase have been taken from this research report, unless otherwise noted.

This is, however, only one example. Similar demand for low latency access to unstructured content is being seen across a variety of industries, including media and entertainment, electronic design automation (EDA), and life sciences.

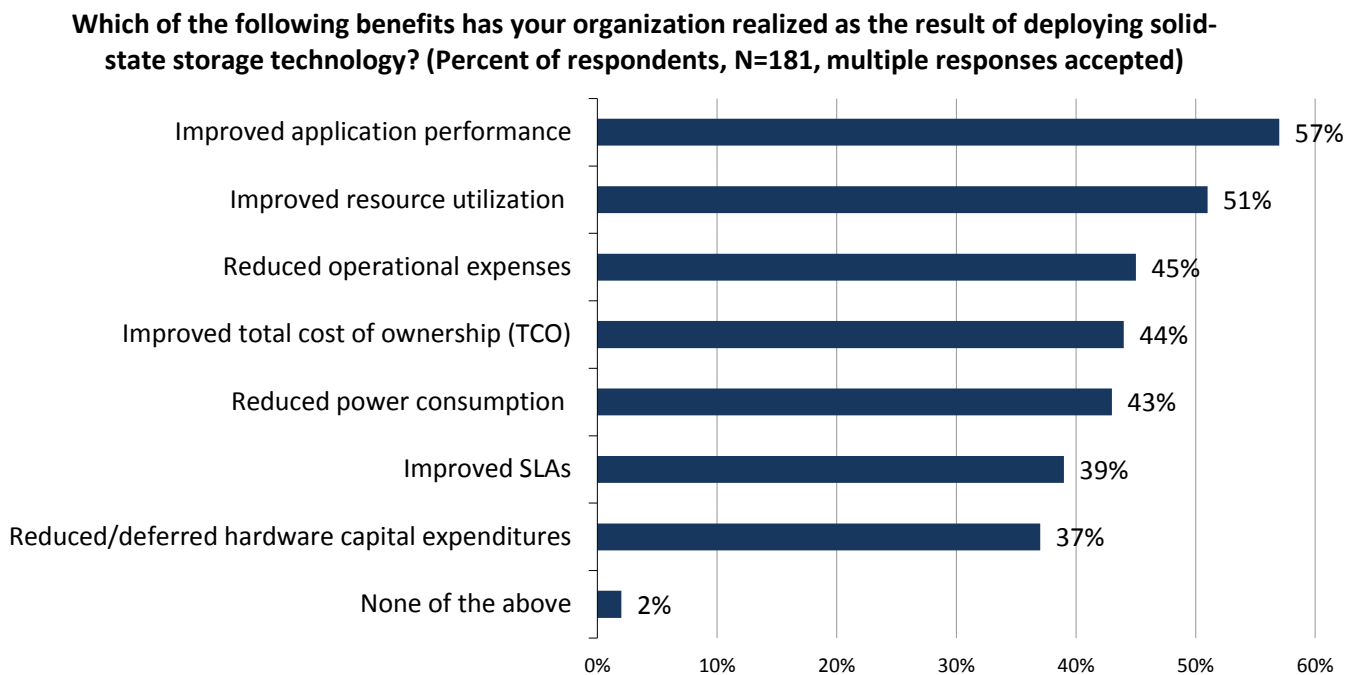
In response to this growing demand for high performance access to unstructured or file-based content, Dell EMC has announced the All Flash Isilon. The storage system is designed to leverage the declining costs of flash storage components and architected to deliver the enterprise file system functionality and scale necessary to serve high performance access to large capacity file storage pools.

The All-flash Disruption

ESG recently surveyed 373 IT decision makers responsible for their organizations’ data storage infrastructures about multiple storage trends and technologies, including solid-state (or flash) storage. As part of this study, 49% of participants identified that their organizations were already leveraging solid-state, or flash, technology, with an additional 20% expecting to deploy it in the next 12 months. Despite its prevalence, solid-state adoption continues to increase.

When participants were then asked to identify the benefits that their organization realized after deploying solid-state (see Figure 1), the most popular response provided was also improved performance. The second, third, and fourth most common responses, however, all reveal benefits likely stemming from improved data efficiency within the IT ecosystem, such as improved resource utilization, reduced operational expenses, and reduced total cost of ownership. In other words, after deploying flash storage, organizations are enjoying a more efficient IT ecosystem, reducing the cost of operations.

FIGURE 1. Benefits Realized as a Result of Deploying Solid-state Storage



Source: Enterprise Strategy Group

With 44% of storage leaders indicating that their organizations realized improved TCO, a strong case could be made that the cost of flash storage was already well within reason. Luckily for the industry, however, the cost of flash storage components has experienced a substantial decrease over recent years, extending the availability of the benefits identified in Figure 1 to a broader set of workloads and data types, such as unstructured data.

Greater Need for Performance Among Unstructured Data Workloads

As businesses continue the perpetual search for a competitive edge, they are demanding new opportunities to leverage data. In response, businesses have experienced rapid growth not only in the creation of new digital content, but also in the speed at which that content must be accessed. As we've seen, business intelligence (BI)/data analytics is the most commonly identified application or workload expected to drive organizations' capacity growth over the next two years. Additionally, in a separate study of IT executives on overall IT spending intentions earlier this year, BI/data analytics-based initiatives was also identified as one of respondents' most important overall IT priorities for 2016.² Two separate audiences are highlighting the importance of business intelligence and big data. The increase in analytics alone, however, is only one piece of the story. In a third ESG research study focused specifically on business intelligence and analytics trends, IT and business professionals were asked to identify the requirements most responsible for driving their organizations to evaluate new BI/analytics solutions.³ One of the two most commonly identified answers was that their organization was moving toward more real time analytics. In other words, not only are businesses demanding more analysis of unstructured data, but they are also demanding that analysis be conducted in real time. While this research data was focused on BI/big data workloads, other industries are demanding high performance access to unstructured as well, e.g., media and entertainment, life sciences, etc.

To effectively serve unstructured-data-based workloads, however, storage systems must be capable of delivering substantial capacity scaling to keep pace with the rapid rate of unstructured data growth. Despite the TCO savings resulting from flash storage deployments mentioned earlier, deploying large flash capacities with all-flash arrays designed for structured or block-based data workloads would require such substantial up-front capital costs that doing so is simply not feasible for many organizations. All-flash for unstructured data must be able to deliver massive scale while leveraging recent cost declines in flash components to make the initial cost of deployment reasonable. In addition, the hardware is only one part of the system. Enterprises demand enterprise-level file system functionality, such as multi-protocol support, automatic migration across tiers, and a scale-out architecture in order to avoid creating a new flash data island. Dell EMC's All Flash Isilon combines its storage-dense, all-flash hardware chassis with its popular Isilon OneFS operating system to deliver a massive capacity, high performance, enterprise-level, scale-out storage system.

All Flash Isilon: Extending the Reach of Flash Technology

The Dell EMC All Flash Isilon is the marriage of a new ultra-dense flash storage chassis with Isilon's established OneFS scale-out file system technology. As such, the system is delivered as an extension of the Isilon family rather than necessitating a separate storage silo. The resulting solution touts a number of benefits, including:

- **All-flash with full functionality of OneFS:** When serving and protecting digital content, enterprise-level software features and functionality are paramount. The All Flash Isilon delivers the same OneFS functionality available in Isilon's disk-based arrays, including multi-protocol support, encryption and security features, automated migration across storage tiers and the cloud, and a full suite of resiliency features.
- **Transition to flash storage when it makes sense:** By extending the Isilon OneFS operating system, the All Flash Isilon is able to pool with existing Isilon storage clusters for a hybrid solution. This flexibility of deployment allows organizations to transition to flash storage when it makes sense without the need to rip out and replace existing storage infrastructure. The result is a substantial savings due to the complexity and cost associated with migrated large capacity file storage environments. The lower cost hurdle enables organizations to reap the benefits of all-flash storage while significantly reducing the capital cost required for the initial deployment.

² Source: ESG Research Report, [2016 IT Spending Intentions Survey](#), February 2016.

³ Source: ESG Research Report, [Enterprise Big Data, Business Intelligence, and Analytics Trends](#), January 2015.

- **High density with granular scalability:** The All Flash Isilon boasts a high level of capacity density—924 TB of flash storage capacity in a four rack unit (4U) chassis. Not every IT environment, however, needs almost a petabyte of flash on day one. Understanding this fact, the All Flash Isilon architecture supports the ability to scale the system in much smaller pieces, around 24 TB per individual node. This granularity further reduces the initial capital cost required to

start leveraging flash storage and eases the ability to scale over time as incremental capacity can be deployed at much smaller capacity points, reducing the cost required as the system scales.

As the industry transitions to infrastructure dominated by all-flash storage, the manner in which the transition takes place can be just as critical as the resulting solution. Higher capacity storage environments, such as those leveraged by unstructured data workloads, take significant time and cost to migrate. All-flash storage solutions that demand a full decommission of existing infrastructure in order to deploy a wholly new all-flash deployment not only demand large up-front capital costs but they also introduce risk as the data is migrated. Additionally, with capacity points often measuring in the petabytes, and quickly growing to the tens, if not hundreds, of petabytes in the future, it is prudent for organizations to think about the impact of potential future data migrations. Companies, like Dell EMC, that are already eliminating the cost and complexity of a full migration for this hardware generation will be more likely to eliminate those costs in future generations as well.

All Flash Isilon Feature Overview

- 924 TB of flash in a 4U chassis
- Scales to 92+ PB (100 chassis) in a single file system
- Multi-protocol (NFS, SMB, HDFS, SWIFT, FTP, HTTP, NDMP)
- SmartPools & CloudPools: Automatic migration across tiers including to the cloud
- Data Management: Dedupe, Quotas, SmartConnect, InsightIQ
- Data Protection: N+1 thru N+4 ECC, Mirroring, Snapshot, Replication
- Security: WORM, Audit, Encryption, Access Zones, Role-based Authentication

The Bigger Truth

Inherent in the current industry storyline of increasing demand for transactional performance and consistent reductions in flash storage costs is an indictment of the future of the traditional spinning disk-based storage system. The rate at which businesses can generate, access, and analyze data is quickly becoming a key measure of their ability to stay competitive. This fact serves as the driving force behind the high importance both IT executives and storage leaders are placing on business intelligence and data analytics applications. The scales have been tipped. High performance data access is no longer an opportunity to achieve an advantage; it is a necessity to keep pace. Business intelligence workloads are only one such example. In health care and life sciences, the ability to more quickly analyze genetic information is expected to save countless lives while reducing the cost of health care. For media and entertainment, increases in resolution are a way of life, with 8K and 16K on the horizon. For EDA, high performance access to digital content speeds production and distribution times. The bottom line is that the transition to all-flash is quickly becoming a necessity. Dell EMC's All Flash Isilon gives IT organizations the power to make that transition on their own terms while significantly reducing the cost and the risk incurred.

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