New Dell EMC PowerStore Delivers High-End Enterprise Storage Features at Midrange Price Point

IDC OPINION

Digital transformation (DX) is a hot topic in most enterprises today. DX drives a host of new business requirements that challenge legacy infrastructure, and information technology (IT) organizations are upgrading to new server and storage platforms at a rapid rate to meet those requirements. Although the enterprise storage market overall continues to grow, revenue for storage systems at midrange price points ($25,000–249,999) is growing at the fastest rate: in 2019, this market grew 10.6% to make up 60.3% of total enterprise storage revenue. Part of the reason the midrange storage segment leads the entry and high-end enterprise storage segments is that these systems are increasingly incorporating the performance, availability, scalability, and functionality of higher-end systems. For IT organizations looking to streamline costs as well as storage infrastructure, systems at midrange price points meet a broader set of requirements than does either of the other two storage classes.

For those IT organizations undergoing infrastructure modernization as part of their DX journey, IDC research indicates that access to new technologies like NVMe, scale-out designs, and artificial intelligence (AI)/machine learning (ML)-driven management is high on the wish list. These technologies are needed to meet increasing performance, availability, scalability, ease of use, and agility requirements in digitally transforming enterprises. For IT organizations looking to do more with less, infrastructure adaptability is key, and in storage, this has heightened interest in platforms that support unified storage, bare metal or virtual deployment, and different deployment modes and can non-disruptively scale both up and out. 91.1% of the enterprises traversing their DX journey deem infrastructure modernization a key determinant of success, upleveling the importance of modernizing IT infrastructure in a manner that opens up access to these and other new technologies on the horizon that will be needed by the digitized enterprise.

In May 2020, Dell EMC introduced the new PowerStore family of clustered storage systems. These systems offer high-end performance, availability, scalability, and functionality starting at midrange price points and incorporate sought-after new technologies like native NVMe, scale-out architecture, software-defined infrastructure, AI/ML-driven system self-management, and a microservices-based storage operating system (OS) design. PowerStore is an interesting and very capable new unified storage system that is scalable to over 4M IOPS and almost 11PB of storage capacity can be deployed in either a disaggregated or hypervisor mode. This system deserves to be on the short list for those enterprise customers looking for the right storage infrastructure for their own DX journey.

IN THIS WHITE PAPER

As enterprises continue to undergo DX, they are looking to improve storage performance, scalability, manageability, and agility as well as IT infrastructure efficiency. This has implications for how IT requirements are met in core, edge, and cloud-based environments and is ushering in new system architectures as well as the use of new technologies like NVMe, scale-out designs, and AI/ML. In this white paper, IDC discusses the evolving nature of IT infrastructure requirements for enterprises that are currently in the midst of their DX.

SITUATION OVERVIEW

DX, which is the move to much more data-centric business models, has become the new imperative for those enterprises looking to leverage the vast amounts of data available to help inform better business decisions. DX impacts all functional organizations within an enterprise, but IT is particularly impacted. CIOs are faced with the need to service legacy workloads to maintain business continuity while deploying next-generation applications (NGAs) that leverage newer technologies like mobile computing, social media, big data and analytics, and cloud to turn available data into strategic business assets. IT infrastructure is no longer just a core datacenter decision as CIOs consider optimal workload placement taking into account edge (or distributed), core datacenter, and public cloud-based locations.

As IT organizations work their way through these decisions, they are modernizing existing IT infrastructure at a rapid rate. According to primary research conducted by IDC in 2020, among those organizations undergoing DX, 68.2% of them are refreshing their storage infrastructure. The most popular general strategy for infrastructure modernization is to move workloads to more software-defined architectures that feature characteristics to meet increasingly stringent performance, availability, scalability, manageability, and agility requirements. New technologies that are important to meet these requirements include NVMe, scale-out architectures, and the use of AI/ML to help streamline administrative tasks and optimize system operation. These new technologies are discussed in detail in the sections that follow.

NVMe

While low latency and high throughput have been critical storage capabilities needed for certain legacy workloads like online transaction processing, many of the NGAs that enterprises are deploying have this high-performance storage requirement as well. These applications often have a much more real-time orientation and are, in many cases, handling high data growth environments that can easily span into the petabyte range over time. For an increasing number of these newer workloads, the SCSI protocol that has been a mainstay of enterprise storage is being challenged to meet performance and efficiency requirements, particularly for all solid state systems that are being used for the most demanding applications.

A new storage protocol standard called NVMe was first introduced in 2011 as the heir apparent to SCSI for higher-performance requirements and has become a widely deployed technology for high-end enterprise storage over the past several years. NVMe was specifically developed for solid state media and makes much better use of solid state storage resources than SCSI can to drive higher performance, increased reliability and endurance, improved efficiencies, and lower cost. NVMe supports much lower latency than SCSI and significantly greater parallelism (a feature particularly important with today's multicore CPUs).

NVMe storage devices first began to be deployed in servers as internal storage, but capacity utilization and scalability limitations, along with a desire to leverage enterprise-class data services (inline data reduction, thin provisioning, RAID, snapshots, encryption, replication, etc.), drove the need for a switched fabric that would allow high-performance NVMe storage to be shared. NVMe over Fabrics (NVMe-oF) fulfills that requirement, thereby enabling the full performance of enterprise-class, shared NVMe-based arrays to be directly applied to application performance. Enterprises will clearly be making the transition from SCSI to NVMe for their primary storage workloads over the next several years, and that transition will also drive the penetration of NVMe-oF (although at a lesser rate). In 2019, NVMe-based all-flash arrays (NAFAs) were already a $2 billion market, and IDC expects that by 2021, NVMe-based arrays will generate over 50% of all primary external storage revenue. NVMe-oF deployments will lag behind those of NVMe-based arrays, but most enterprises buying shared storage solutions for primary workloads will need to know that they have a simple upgrade path to NVMe-oF when they need it.

NVMe technology, both in the storage array and the storage network, will support a streamlining of IT infrastructure. Smaller systems with fewer storage devices and network ports will be able to significantly outperform SCSI-based arrays of equal size. The ability of NVMe to support increased IT infrastructure density is expected to simplify systems, reduce floor space requirements, and possibly reduce energy consumption (depending on how the technology is deployed). The use of NVMe in midrange arrays, which to date has been less widespread than with high-end enterprise arrays, will significantly up the performance capabilities of these systems, allowing them to in some cases surpass the performance capabilities of the last generation's high-end arrays at lower cost.

Scale-Out Architectures

Most successful IT organizations undergoing DX are experiencing very high data growth. To easily accommodate this growth, storage administrators need to be able to easily expand their storage infrastructure in a nondisruptive manner. A successful start-up initially needing tens of terabytes could easily grow into needing petabytes of storage within just a few short years – certainly within the common life cycle of three to five years for enterprise storage. One of the factors driving the industry's significant interest in and purchase of software-defined storage systems is the ability of many of these systems to scale non-disruptively by the simple addition of more nodes into a cluster. Federated clustering allows this to occur, preserving a unified management interface even as a cluster expands to more nodes to meet higher-performance and/or higher-capacity requirements.

Scale-out designs offer attractive advantages for high-growth environments:

- They provide low-cost configurations that are easy to purchase and deploy for edge environments. Scaling these systems is as easy as just adding another node, and with sophisticated storage management skills in short supply in these types of distributed environments, that simplicity is very attractive.

- The range of scalability of these systems is very broad, and they allow customers to scale both performance and capacity much more so than traditional scale-up platforms that can just scale storage capacity, providing a much more balanced growth path.

- The distributed nature of these platforms helps avoid "noisy neighbor" performance problems because workloads tend to have an affinity to run on a given node but can be easily moved to another node (or a newly added node) in the cluster for more efficient workload balancing.

For these and other reasons, IDC has noted the rise of scale-out platform revenue in enterprise storage, and while traditional external storage array designs still generate more revenue than scale-out platforms, there is no doubt that the industry is moving toward scale-out architectures (just as they are also moving toward software-defined designs).

Intelligent Management

Software-defined platforms provide significant configuration flexibility, thus effectively turning server, storage, and networking resources into programmable infrastructure. This feature alone can be attractive to administrators who have worked with more static IT infrastructure in the past, but when that flexibility can be combined with real-time AI/ML capabilities, enterprises take a giant step toward autonomous operations. This moves IT operations from riskier, less productive manual administration toward more efficient policy-based administration, freeing IT management resources up to perform more strategic tasks. It also meshes well with the trend IDC has noted for storage management tasks to migrate more toward IT generalists (e.g., virtual administrators, Windows/Linux systems managers) and away from more costly dedicated storage management groups. Policy-based management allows administrators to more closely tie systems performance to specific business goals, and when that management is informed by AI/ML, it becomes faster and less risky than manual storage administration.

Many enterprise storage providers offer what IDC refers to as a "cloud-based predictive analytics platform," which has effectively replaced their older "remote monitoring" systems. The three key features that differentiate these intelligent platforms from the legacy remote monitoring approach are the scope of monitoring, how data is stored and shared, and the use of AI/ML to drive autonomous operations. These new systems collect significantly more data than before, not only capturing more in-depth metrics from more components within a given storage system but also extending that data capture to other IT infrastructure components like servers, networking, and applications. These systems drive real value for end users in optimizing their installed systems to meet defined objectives in performance, availability, and other areas. Vendors that provide these systems for their enterprise storage platforms are increasingly using them to differentiate themselves from the competition.

Cloud-based predictive analytics platforms not only collect extensive telemetrics from individual systems but also make that data available to the vendor more broadly to improve the customer experience for the entire installed base. To facilitate secure sharing and enable massive scalability, this collected data is stored in a vendor-specific private cloud. Anonymized data collected from individual systems can help predictively avoid known issues that have happened anywhere across the entire installed base. All of the telemetric and other data stored in the secure cloud-based repository enable it to be easily shared across different functional groups within a vendor (tech support, manufacturing, product management, etc.). Each of these groups can independently analyze the data using AI/ML algorithms to perform a variety of tasks, including performance and availability monitoring, predictive analysis for fault management, performance and capacity planning and upgrade verification, best practice dissemination across the installed base, faster problem resolution, troubleshooting application issues that extend outside of storage, and rate of usage of product features. These systems can drive autonomous real-time optimizations to respond to events like failures, slowdowns, expansion, and new workload additions to ensure that systems continue to meet service-level agreements (SLAs) regardless of what is going on in the system.

It is interesting to note that the rise of AI/ML-driven big data and analytics applications to better inform business decisions is mirrored by the use of these same technologies to improve the self-management capabilities of IT infrastructure. 73.8% of enterprises are very or extremely interested in autonomous operations, and 71.0% highly value (and are very comfortable with) the use of AI/ML technologies to implement these types of operations in the datacenter.

Today's Dynamic Business Environment Requires Flexibility

DX opens up a new era in business development as well as in efficiency. Data collected from customers about usage, desired features, and new consumption models, when combined with market data and the power of AI/ML-driven data analytics, identifies new market opportunities for enterprises to go after given their product, services, and technology portfolios. At the same time, internally collected data about products, workflows, and processes helps businesses incrementally (and in some cases disruptively) improve their business efficiencies. Together, this data-driven awareness opens up many new directions for enterprises, and to take advantage of the right data in a timely manner requires significant flexibility in both business thinking and the IT infrastructure that is increasingly becoming a competitive weapon for digitally transformed organizations. This latter requirement is what is driving the demand for agility — an agility that spans configuration and deployment options, consumption models, and the ability to seamlessly accommodate critical new technologies that can drive competitive differentiation as those become available.

Modernized storage infrastructure needs to be built around a set of design tenets that are very different from legacy architectures. They must be **data centric,** providing features and capabilities that don't just manage storage but can help transform data into a strategic asset. They must be **intelligent,** delivering flexible programmable infrastructure, proactive infrastructure health analytics, and policy-driven autonomous operations. And they must be **adaptable,** supporting a variety of different workload, deployment, and consumption models that give the enterprise the freedom to innovate and expand dynamically in the most efficient manner.

Introducing the Dell EMC PowerStore Family

In May 2020, Dell EMC shipped the PowerStore, a new modernized storage appliance that includes the capabilities that digitally transforming enterprises are looking for in modernized infrastructure. Incorporating technologies like NVMe, a new federated scale-out design, AI/ML, and a storage operating environment using a container-based microservices architecture, PowerStore delivers up to 3x lower latencies than the previous-generation Dell EMC Unity XT and can scale from an entry-level 11.52TB raw to a maximum 3.59PB raw within a single system image (or a maximum of 10.7PB, assuming 4:1 data reduction and RAID protection). Unique among storage platforms with an enterprise-class heritage (and new to this release), PowerStore can be configured to run in either a disaggregated or hypervisor mode, providing significant additional flexibility in the types of environments it can be used to support. In the disaggregated mode, PowerStore functions as a dedicated enterprise storage array, whereas in the hypervisor mode, applications can be run directly on the PowerStore appliances as well leveraging a new feature what Dell EMC calls "AppsON." And the entire system is covered under Dell EMC's Future-Proof Loyalty Program, which includes a variety of guarantees and features that improve the overall enterprise storage customer experience.

High-End Enterprise Storage Capabilities in a Midrange Package

The Dell EMC PowerStore brings high-end enterprise-class performance, scalability, and functionality into a midrange package with aggressive price/performance. Its software-defined design leverages dual active/active controller "appliance" building blocks with multicore Intel Skylake CPUs, which include the Intel "QuickAssist" feature, which can provide hardware-driven data services like compression, hashing, and encryption. With the first version of PowerStore, Dell EMC is using Intel QuickAssist for compression, a factor that helps drive a new "no questions asked" data reduction guarantee of 4:1 (regardless of workload mix). (Note that the data reduction ratio is based on compression and data deduplication only.) Relative to the prior Dell EMC Unity XT platform, PowerStore includes double the memory and extends the system family with two higher-end models (the PowerStore 7000 and 9000) that rival competitive high-end storage systems in terms of performance and capacity. Whereas the prior Unity XT platform was available in three models (the 480F, 680F, and 880F), PowerStore is available in five models (the 1000, 3000, 5000, 7000, and 9000). A maximally configured PowerStore 9000 appliance building block includes 4 CPUs with 112 cores, has 2.56TB of memory, and consumes 2U of rack space. Up to four appliance nodes can be configured in a "federated" scale-out cluster configuration that supports up to 384 2.5in. drives.

The core building block features native NVMe, supporting a variety of solid state disk (SSD) drives (1.92, 3.84, 7.68, and 15.36TB) and storage-class memory (SCM; using Intel Optane media) options (375GB and 750GB). The core building block supports either NAND flash-based NVMe SSDs or storage-class memory devices as persistent storage but will allow mixing in a later release. Each appliance can support up to 4 NVRAM cache cards and 21 2.5in. NVMe SSDs. Available SAS-connected storage expansion cabinets (25 2.5in. devices in 2U) extend the overall system capacity and give PowerStore the ability to support SCSI-based SSDs as well for more configuration flexibility. Given the ability to simultaneously support both NVMe and SCSI storage devices makes the system a fusion all solid state array (FASA), a new system type introduced in *IDC's Worldwide Enterprise Storage Systems Taxonomy, 2020* (IDC #US45949020, February 2020).

Embedded networking includes 1/10/25GbE, and the system supports both 32Gb Fibre Channel (FC) and 25/10GbE for storage network connections. Initially, the system uses SCSI host connections, but it can be easily transitioned to support NVMe-oF with just a simple software upgrade when that option becomes available.

The PowerStore storage OS uses a microservices-based design with different modules running in containers. The core OS supports "always on" data reduction (compression and deduplication), thin provisioning, RAID, snapshots, encryption, quality of service (QoS), and asynchronous replication, and it also supports additional modules for file services, AI/ML-driven system health status monitoring, integrated copy data management, application-integrated snapshots (AppSync), serviceability, security, and other functions. For hypervisor-based deployments, the entire storage software stack fits into a single virtual machine (VM). In microservices architectures, all modules communicate through APIs, a design that allows functional modules to be upgraded separately. This operating system design approach allows new features and fixes to be introduced more rapidly and with less risk.

Intelligence Drives More Efficient, Autonomous Operations

The Dell EMC PowerStore integrates hundreds of sensors on each appliance, which are continuously tracking performance, availability, resource utilization, and overall system health. AI/ML algorithms both within the system and in CloudIQ (Dell EMC's cloud-based predictive analytics platform) ensure that storage is optimized in real time to meet administrator-defined SLAs, impending failures are

proactively resolved, developing workload imbalances are identified and resolved before they impact performance, and anomalous behavior is discovered and flagged. New resources are automatically discovered and new workloads given a placement recommendation, while collected data assists in upgrade verification, local and remote troubleshooting, and performance and capacity planning. All these AI/ML-driven features combine to ensure systems meet business requirements, data availability is maximized, and storage resources are most efficiently used.

Dell EMC supports a variety of orchestration and automation tools for both physical and virtual deployments. PowerStore's integration with these tools through APIs allows administrators to automate recurring workflows that can be either event driven or kicked off with a single click. Automation lowers risk, improves the reliability and speed of even infrequently executed workflows, and frees operators up to perform more strategic tasks. PowerStore features extensive VMware integration for virtualized environments as well as provides APIs that enable integration with popular data protection and control plane tools for bare metal environments.

Flexible Adaptability Broadens the Range of Use Cases

The Dell EMC PowerStore can be deployed in a number of different configurations that support different types of environments. It can support both scale-up (expanding the effective capacity associated with each appliance building block up to almost 3PB) and scale-out (adding more appliances and therefore performance up to a total of four dual-controller appliances) deployments, enabling multinode configurations to be managed as a single system image. As a true unified storage system, PowerStore can simultaneously support block, file, and VMware Virtual Volumes (VVols) access methods, enabling administrators to configure the access method by application. Quality-of-service tools ensure that "noisy neighbor" issues don't arise in mixed workload environments. PowerStore can be deployed in bare metal configurations where the OS and other functional software modules run in containers or in virtual configurations using VMware ESXi (where the software components are run in a VM). Different deployment modes (disaggregated, hypervisor) provide additional configuration flexibility, making the system appropriate for a broad range of different use cases in both edge and core environments.

Because PowerStore draws upon a strong datacenter heritage, it can fit a range of datacenter use cases. Given its expanded performance and capacity, it can enable broader consolidation of block, file, and/or VVols workloads than prior-generation systems. It can be deployed on bare metal or using a hypervisor like VMware ESXi. For those customers looking for a technology refresh for existing disaggregated storage, PowerStore transitions such storage systems to modernized storage infrastructure that features NVMe, software-defined platforms, scale-out designs, and AI/ML technologies. By deploying PowerStore with the AppsON feature enabled, costs can be lowered further by eliminating servers and switch ports that are no longer needed when applications are running on PowerStore in the hypervisor mode. This reduced datacenter infrastructure results in more streamlined configurations that are easier to manage, consume less energy and floor space, and offer more configuration flexibility than either pure disaggregated or traditional HCI storage. Target workloads for datacenter deployments include databases and applications (both bare metal and virtualized), as well as file- and object-based workloads like file shares, PACS, home directories, images and video, archiving, web applications, and emerging NGA workloads.

When deployed in virtual configurations, PowerStore supports a unique ability to run applications directly on the storage appliance in dedicated VMs (the previously mentioned hypervisor mode). With AppsON, applications like databases, enterprise applications, electronic medical records, content repositories, and cloud-native workloads can be run in dedicated VMs on one or more appliances in a cluster. With its VMware integration, PowerStore makes an excellent storage platform for the VMware Cloud Foundation. For edge or distributed deployments, the ability to run databases, analytics workloads, file shares, and other edge applications locally can provide important business advantages. In addition to the workload consolidation options that AppsON enables in the datacenter, the AppsON deployment model offers several advantages that extend PowerStore to additional use cases in edge and distributed environments that are not served by traditional midrange storage platforms:

- For edge or distributed environments where space is at a premium, customers can consolidate infrastructure by getting rid of separate server and storage components and moving to a PowerStore using the AppsON feature. The fact that customers get a unified management interface for server, storage, and networking resources in this configuration is a nice by-product of this decision.

- The hypervisor mode can also offer latency advantages because CPUs communicate directly with internal NVMe storage devices rather than going out across a storage network (which can add significant latency, depending on which type of storage network is deployed).

- For distributed environments that may have less sophisticated administrative resources, PowerStore offers high-availability capabilities even in entry-level configurations and makes system expansion drop dead simple (just add another appliance pair whose resources get automatically configured into the cluster). It also uses a more efficient data protection method (single-parity RAID) that is more capacity efficient than the multiparity erasure coding approach used in popular traditional HCI products, lowering storage capacity requirements.

- PowerStore brings enterprise-class data services to distributed environments with features that can be selectively deployed as needed for various edge workloads and use cases. The inline data reduction makes very efficient use of capacity for lower cost, snapshots can feed local analytics as well as data protection and recovery workflows, and replication makes it simple to replicate data sets back to core datacenters or set up disaster recovery solutions using cloud-based services.

Dell EMC Future-Proof Loyalty Program

Several years ago, Dell EMC introduced the Future-Proof Loyalty Program, a set of programs and guarantees designed to move customer experience throughout the enterprise storage life cycle to the next level. The program covers all Dell EMC enterprise storage systems, including components such as a three-year satisfaction guarantee, hardware investment protection over the life of the systems, nondisruptive data migrations, data reduction guarantees, all-inclusive software bundling with all systems for added value, multiple consumption model options from outright purchase through pay per use and as a service, and hybrid cloud enabled. The Dell EMC PowerStore platform is covered under this program, a fact that supports the peace of mind customers get from dealing with a proven storage vendor that is the number 1 market share holder in external storage (and has been for years).

The Future-Proof Loyalty Program includes some interesting features to ease technology refresh. There are three options to upgrade PowerStore configurations to increased performance and/or capacity, and a customer can choose any one of these options during the life of the system:

- First, customers may upgrade to more powerful nodes (e.g., when a customer purchases PowerStore 3000 nodes but later wants to upgrade to PowerStore 5000 nodes).
- Second, when new storage controllers become available (based on, e.g., a new Intel chipset), customers may upgrade all nodes in a system to those new controllers at no charge.
- Third, customers may apply a discount to introduce an additional pair of PowerStore appliances of the current system type to the existing configurations (e.g., when a customer expands an existing PowerStore 3000 configuration to a four-node PowerStore 3000 configuration).

Customers should note that these upgrades can be performed at any time 180 days after initial system invoicing as long as the system is covered under the Future-Proof Loyalty Program's ProDeploy Plus tier. The first two upgrade options can be deployed non-disruptively while application services continue to run.

The Business Value of the Dell EMC PowerStore

The Dell EMC PowerStore represents not only a big jump in performance over prior-generation storage in the midrange price bracket due to its use of NVMe technology, but it brings significantly improved capacity utilization based on new data reduction technologies and boasts much more aggressive price performance. With its support for NVMe and NAND flash-based SSDs, PowerStore can drive more than a 3x reduction in latencies, compared with conventional SCSI-based storage platforms (and can drop that by an additional 20% using storage-class memory). Given that it can scale up to four nodes in federated scale-out clusters, PowerStore can scale to well beyond 4M IOPS. With this level of performance, PowerStore is clearly competing with some high-end storage platforms, albeit at a much better price point.

For capacity utilization, the move to hardware-assisted compression not only offloads the storage controllers, enabling them to drive higher throughput, but also imposes no latency noticeable at the application level. In conjunction with other optimizations Dell EMC provides through the new version of the PowerStore storage OS, the vendor has now moved its data reduction guarantee for mixed workloads from 3:1 (in the prior generation) to 4:1. This efficiency improvement lets customers hit similar capacity points with 25% fewer storage devices, increases the effective storage density to just under 200TB/U, and enables lower energy and/or floor space consumption. Which of these specific benefits customers will enjoy will depend on which storage device sizes and types they choose. With support for NVMe and almost 11PB of effective capacity, PowerStore will be able to compete with many high-end arrays despite its midrange price point.

Figure 1 provides the business value summary of the Dell EMC PowerStore.

FIGURE 1

The Dell EMC PowerStore Business Value Summary

Dell EMC PowerStore Business Value Summary

Compared to Existing Midrange Storage (industry average)

- Up to 3x lower latencies
- Increase workload density up to 10x
- Up to 25% fewer devices at any given capacity point
- Up to 70% less rack space (assumes AppsON usage)
- Up to 99% less effort to rebalance volumes
- Migrate data non-disruptively from existing storage in minutes (7 clicks)

Source: IDC, 2020

NVMe offers significantly greater parallelism than SCSI. While SCSI supports a single storage queue with a depth of 256, NVMe supports up to 64K storage queues, each with a depth of 64K. This enables a very compact NVMe-based storage platform to effectively service many more servers, each of which actually operates with a much higher level of CPU utilization (due to NVMe's much lower latencies). This decreases not only server costs but also software licensing costs on those servers. And for customers leveraging AppsON, the savings on the server side will be even greater. When comparing a PowerStore running AppsON with a traditional three-tier infrastructure, customers can expect to see up to a 70% savings in rack space.

The AI/ML-driven system self-management capabilities will clearly result in administrative productivity savings. Performance tuning tasks will become almost fully automated (if a customer so desires) once administrator-defined policies are implemented. PowerStore's ability to proactively identify workloads that may soon become capacity constrained and move them to other nodes in the cluster removes the manual operations associated with volume and workload rebalancing: There is 99% less effort when using PowerStore's CloudIQ-generated recommendations for workload placement and/or rebalancing after deployment than if conventional methods are used.

When customers take all of these aspects into account, Dell EMC PowerStore generates significant business value because of better performance and higher infrastructure density, easier management (with improved administrative productivity), and more efficient and streamlined IT infrastructure. Compared with other storage systems at midrange price points, PowerStore offers improved IOPS per

terabyte, lower watts per terabyte, better terabyte per Unit, and (with the new federated scale-out version of the storage OS) a broader range of scalability.

CHALLENGES/OPPORTUNITIES

While the Dell EMC PowerStore brings significant performance, capacity, and efficiency benefits that will result in more streamlined IT infrastructure, the vendor will need to clearly message the new system's total cost of ownership (TCO) advantages. One of the reasons NVMe has been slower to migrate to arrays at midrange price points is because among many customers, it is perceived as a higher-cost solution than SCSI. The fact is that, when comparing similarly priced systems with PowerStore, the system turns in impressive comparisons:[1]

- Comparing a PowerStore 1000 with a traditional dual-controller, 500TB+ array, the PowerStore delivers up to 3x lower latencies and 5% more raw capacity in a configuration that requires 25% fewer devices at a lower price point (~7% lower).
- Comparing a PowerStore 5000 with a traditional dual-controller, 1PB+ array, the PowerStore delivers up to 2x lower latencies and 3% more raw capacity in a configuration that requires 25% fewer devices at a slight (4%) price premium.

There are clear business benefits to NVMe in driving higher performance, improved efficiencies, more streamlined infrastructure, and access to emerging persistent memory technologies like storage-class memory, but Dell EMC needs to ensure that prospective customers understand that they can enjoy all of this with at most a very small price premium. If Dell EMC can effectively communicate the TCO benefits of PowerStore, Dell EMC can present a compelling value proposition to not only the CIO but the CFO as well.

With the new AppsON capability, Dell EMC has a unique opportunity to significantly broaden the market opportunity for PowerStore. The system clearly outcompetes traditional midrange platforms and extends into the high-end systems with midrange price/performance. It also includes the AppsON feature, which is not available on competitive disaggregated storage offerings. At the same time, PowerStore edge configurations will deliver enterprise-class performance, availability, and functionality that is based on the same architecture used in core deployments — all at a very attractive price point when edge infrastructure consolidation opportunities are considered.

The flexible deployment modes give customers many options to configure systems optimally for their specific requirements. And with this array, they have removed the prospect of a disruptive upgrade to accommodate future NVMe-based technologies: PowerStore either supports NVMe products today (SCM) or offers a simple growth path to them (NVMe-oF) without requiring any kind of forklift upgrade. As a replacement platform for the very successful Dell EMC Unity XT, effective marketing can ensure that PowerStore provides a springboard to Dell EMCs continued future growth in enterprise storage.

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[1] These comparisons are based on reference configurations at two price points (a medium-sized system and a large enterprise system) provided by Dell EMC and validated by IDC.

CONCLUSION

Among enterprises undergoing DX, storage infrastructure modernization is occurring at over two-third of organizations. The importance of this refresh is underlined by the fact that 91.1% of IT organizations consider infrastructure modernization as either very or extremely important as a determinant of DX success. In the storage arena, top technologies customers are interested in leveraging as part of their IT strategy include NVMe, scale-out architectures, and the use of AI/ML to help improve IT efficiency and productivity. These technologies provide the higher performance, increased scalability, better infrastructure efficiency, easier manageability, and improved flexibility that enterprises need to deliver for today's digitally transformed organization.

With the new Dell EMC PowerStore launch, the vendor is delivering these sought-after technologies in a platform that can scale to compete with higher-end systems but is available at midrange price points. And Dell EMC has added an interesting new twist with the AppsON feature that differentiates it not only against other external storage but will enable low-end versions of the system to compete very effectively for edge and other distributed environment use cases. These features have all been combined in a design that enables broad workload consolidation, which will result in not only higher IT productivity but also lower costs from a more streamlined infrastructure (particularly if customers will be getting rid of some servers using the AppsON feature). For enterprises undergoing DX and looking to leverage newer technologies like NVMe, scale-out architectures, and AI/ML, the new Dell EMC PowerStore has a lot to offer.

About IDC

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