DELL Technologies

Solution Overview

Why Dell EMC PowerStore for Microsoft SQL Server

PowerStore is designed to support Microsoft SQL Server workloads by delivering multi-protocol Block, File, and vVOL storage in a performance optimized appliance that supports end-to-end NVMe and can scale up and out when demands increase. It also delivers up to efficiency without compromise with always-on thin provisioning and inline data reduction.

A Modern Storage Appliance Designed for the Data Decade

PowerStore provides our customers with data-centric, intelligent, and adaptable infrastructure that supports both traditional and modern workloads

Solutions starting as low as $28K[2]

PowerStore 500, the new entry level appliance, is capable of up to 2.4 million transactions per minute[3]

Scale-up to 1PB raw per system & scale-out to 8 active-active nodes

4:1 guaranteed inline data reduction without compromising performance

PowerStore streamlines application development and automates storage workflows through integration with VMware

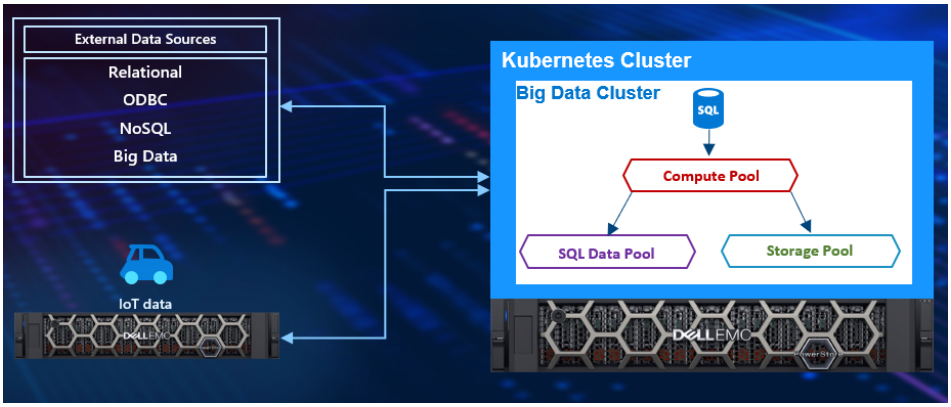
PowerStore users can take advantage of plug-ins including those for VMware (vRO Plugin), Kubernetes (CSI Driver), and Ansible (Ansible Module).

Data is being democratized, the combination of massive amounts of data and technology innovation provide the opportunity for businesses to transform into disruptive, digital powerhouses. According to ESG's 2019 Data Storage Trends Survey, 71% of organizations believe data is strategic to their business, and effective storage strategies are critical to creating competitive advantage in their industry[1]. In addition, 63% expect to develop and offer new data-centric products and services (i.e., either selling data or insights based on that data) in the next 24 months.

SQL Server 2019: Your Modern Data Platform

Over the past 25+ years, Microsoft SQL Server has evolved beyond a simple relational database management system. Recent versions have introduced capabilities like PolyBase for gaining intelligence over your data by giving you access to query and process data outside of a traditional SQL Server instance.

These features continued to evolve with Microsoft SQL Server 2019 introducing big data clusters. HDFS and Spark are being brought into SQL Server and PolyBase is being used to create a data virtualization layer across a wide variety of data sources; like data in earlier versions of SQL, Oracle Database, MongoDB, unstructured data, and many more. With the ability to pull from so many disparate data sources, the underlying storage requirements can be diverse and complex to manage.



The SQL Server PolyBase technology can access and query both non-relational and relational data, residing in different locations, all from within SQL Server, with T-SQL. Microsoft SQL Server 2019 enables applications and users to query a variety of data stores — including MongoDB®, Azure® Cosmos DB, NoSQL, Oracle®, Azure SQL Database, Azure SQL Data Warehouse, relational databases and big data stores in Hadoop® Distributed File System (HDFS) — or any open database connectivity (ODBC)–compliant data source via a generic ODBC driver. This ability to query data from a multitude of external data sources removes the boundaries and ETL/ELT processes perpetuated by data silos, creating a unified data management platform.

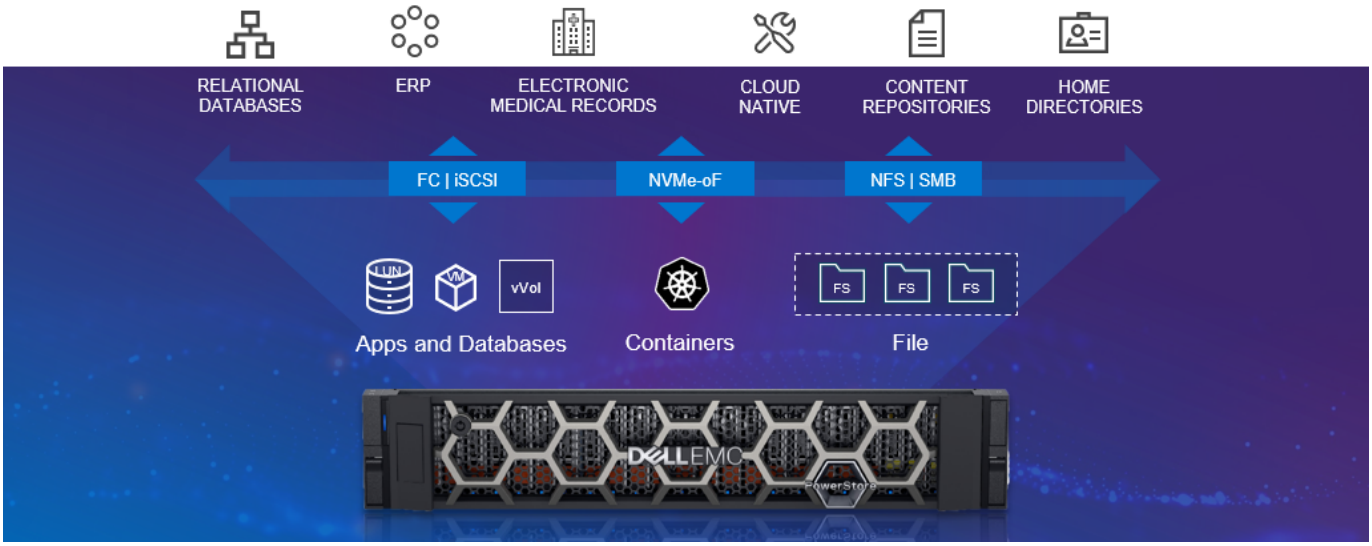
1 https://www.esg-global.com/research/esg-master-survey-results-2019-data-storage-trends
2 Based on April 2021 Dell Technologies pricing in US dollars for PowerStore 500T when configured with six (6) 1.92TB NVMe drives, 96GB DIMMs, 1440W PSU and 1-year ProSupport NBD. Actual price may vary based on a variety of factors.
3 Based on Dell tests of PowerStore 500T, running SQL Server OLTP (TPC-C-like) workloads. Actual performance may vary by configuration and workload

PowerStore: Consolidation for Traditional and Modern Workloads

Customers have a wide variety of traditional and modern workloads – examples include relational databases, to ERP and EMR apps, cloud native applications, and file-based workloads such as content repositories and home directories.

PowerStore's single architecture for block, file, and vVols utilizes the latest technologies to achieve disparate objectives without sacrificing the cost-effective nature of midrange storage. The ability to provide storage in multiple formats to applications, ranging from physical and virtual volumes to containers to traditional files, provides the ultimate workload flexibility and enables IT to simplify and consolidate infrastructure. Comprehensive integration with open management frameworks, containerization platforms, DevOps platforms and virtualization enable PowerStore to seamlessly support the demands of Microsoft SQL Server.

PowerStore is designed from the ground up to utilize the latest in storage and interface technologies in order to maximize application performance and eliminate bottlenecks. Each PowerStore appliance has two active-active nodes and uses NVMe to take full advantage of the tremendous speed and low latency of this next generation media, with greater device bandwidth and queue depth. PowerStore has been architected to maximize performance with NVMe flash storage and supports the even greater demands of Intel Optane Storage Class Memory (SCM) which provides performance approaching the speed of DRAM. This performance-centric design enables PowerStore to deliver 6x more IOPs and 3x lower latency for real-world workloads compared to previous generations of Dell midrange storage.



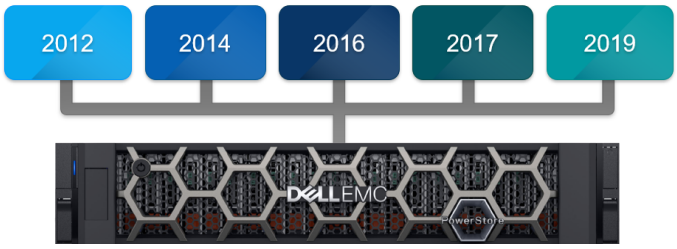
Containerization is Driving Multiple Transformations

SQL Server 2019 has embraced the use of Docker containers and Linux for dev/ops and production workloads, potentially requiring some workforce transformation to properly deploy and manage the environment. Kubernetes, is the container orchestration tool that makes this deployment and management easier and more consistent over the life-cycle of an application. Kubernetes allows a group of physical systems or even VMs to be leveraged as a unified API platform that a developer can interact with, without needing to know what the infrastructure is below. Thus, allowing for infrastructure as code and the simplified deployment of big data clusters via IaaC toolsets.

Containers allow for great portability and flexibility for developers, however, for stateful applications built on container architecture a gap existed; there was no way for data to persist. The ephemeral nature of containers meant that the data would be lost in the event of shutdown or some sort of disruption. The Container Storage Interface (CSI), was a multi year effort led by Google with supporters from other companies to provide a true, common, open API to connect storage arrays to the Docker containers. CSI has gained support across the storage industry, it started with basic features and continues to add more advanced features, and it will release versions incrementally. As updated versions get released for Dell EMC Storage, plug-ins can be found at via GitHub/Dell along with other helpful content for the automation of your Dell EMC PowerStore storage appliance.

Consolidation for All SQL Versions

Dell Technologies is leading the modernization of the datacenter with Dell EMC storage solutions that allow for the consolidation of data on platforms designed for highly available, sub-millisecond sustained latency, maximum agility, and superior security. Optimizing the underlying infrastructure for Microsoft SQL Server not only benefits the storage administrators; it also has a significant impact on the effective agility of DBAs leveraging arrays.



One of the great features of big data clusters is their ability to gain insights on data where that data sits today. This has significant impact on reducing or even eliminating the ETL (Extract, Transform, Load) process that is required for running reports or near-real time analytics. However, this does not mean that they underlying storage becomes less relevant. Having all of your Microsoft data estate consolidated onto Dell EMC PowerStore reduces hardware footprint and complexity while increasing the performance, security and data protection and repurposing of all versions.

The reality for most companies is that their Microsoft SQL Server environments span many different versions which have disparate features and capabilities. Consolidation of these versions on to a modern active-active all-flash array allows for the offloading of some responsibilities to the infrastructure and helps to provide a more consistent and elevated experience to all versions. The benefits that are experienced are largely based on the data services provided by the array and these are highly differentiated across the industry with respect to the performance impact and effectiveness of the data services. Next, we will explore some of the key benefits of PowerStore's data services.

Modern Array Data Services & Scale

In an all-flash, and now in an all NVMe, environment there is always significant focus on the effective capacity of the array to maximize efficiency and TCO. Data services create efficiencies of how data is stored on an array, a major side effect is unparalleled agility for SQL Server.

Dell EMC PowerStore makes it much simpler for the DBA to be able to deploy and manage new Microsoft SQL Server based applications, provide robust database protection, and implement a database re-purposing model.

While the maturation of flash storage has resulted in significant price-per-TB reductions for end users, the technology depends on the benefits of data reduction technologies to further reduce the effective cost of storage. PowerStore delivers consistent storage efficiency enabled by its in-line, always-on data reduction which includes pattern detection, deduplication and compression. Compression is handled by a dedicated hardware chip which utilizes Intel’s Quick Assist Technology that provides very high compression ratios without burdening the CPUs.

The hardware offload capability integrated into each PowerStore appliance provides 40 Gbps of total throughput, thereby conserving resources for storage I/O tasks. With PowerStore, organizations will average 4:1 data reduction without compromising performance and services, though much higher ratios are achievable depending on the workload.

While these data reduction ratios provide powerful ongoing TCO advantages and delay the need for additional drive purchases, most environments eventually need to add physical capacity. PowerStore customers can easily enhance both capacity and performance independently. In addition to capacity expansion within a single appliance (up to 1PB raw per system), advanced clustering technology allows PowerStore to scale both capacity and processing power by clustering up to four appliances/8 active-active nodes together. PowerStore’s combination of scale-out and scale-up helps tailor growth to the unique needs of individual environments.

Maximize the Value of Your Microsoft SQL Server Deployments

Thanks to Microsoft and Dell Technologies, the tools for maximizing IT's impact on your business' future have never been more accessible than they are today. Microsoft SQL Server 2019 combined with the flexible storage foundation of Dell EMC PowerStore make your data more actionable for insights, giving you an agile, adaptable solution that will empower your success throughout the data decade.

Linux based Docker containers managed by Kubernetes may seem like a steep climb just to get to the starting point of deploying Microsoft SQL Server 2019 and big data clusters. However, Dell Technologies has developed guidance, best practices and even means of automation through the leveraging of Ansible and more.

PowerStore offers a significant amount of deployment flexibility delivering multi-protoctol Block, File and vVOls. Administrators can also access the hypervisor to deploy applications directly on the PowerStore appliance, using the same VMware tools and methods they use with external hosts. This game-changing capability, known as AppsON, is ideal for data-intensive workloads in core or edge locations where infrastructure simplicity and density is required, PowerStore architecture enables offloading storage-hungry and performance-sensitive workloads.

Modern Array Data Services & Scale

IT organizations can realize the value of today's infrastructure with the comfort of knowing their investments are protected for the long-term with the Future-Proof program. Customers can optimize the life-cycle of their infrastructure with confidence through guaranteed IT outcomes, the ability to seamlessly modernize with the latest technologies, and by eliminating future cost uncertainties to plan predictably for the future.

Dell Technologies stands behind PowerStore with Anytime Upgrades, the industry's most comprehensive upgrade program that provides data-in-place upgrades within the same generation or next-generation of appliances, or scale-out for existing environment with a second system equal to the current model. PowerStore nodes (controllers) can be replaced non-disruptively while preserving existing drives and expansion enclosures, without requiring new licensing or additional purchases. With PowerStore, infrastructure can be modernized without a forklift upgrade, without downtime, and without impacting applications. End data migrations, forever.

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