DELL EMC

Solution Brief

Dell EMC Solutions for Microsoft SQL Server on a Virtualized Infrastructure

Benefits of Virtualizing SQL Server

- Lowers infrastructure costs
- Enables organizations to standardize skill sets
- Provides consistently high availability
- Simplifies disaster recovery

Benefits of a Dell EMC Infrastructure for Virtualized SQL Server

- Establishes a strong foundation for supporting virtualized environments
- Provides high-capacity, high-performance, and reliable storage
- Delivers transformational insights from both structured and unstructured data
- Offers a wide choice in platform deployment and consumption models for SQL Server

Virtualizing Microsoft SQL Server

Microsoft SQL Server database environments are growing in both size and complexity, fueled by rising data volumes and new business demands. SQL Server databases now sit at the heart of many existing enterprises, powering mission-critical applications, and are being positioned to power new “digital-native” businesses.

It is no surprise that organizations continue to embrace a virtualization strategy for SQL Server, leveraging Microsoft Hyper-V and VMware vSphere to lower infrastructure costs, standardize skill sets, provide consistently high availability, and simplify disaster recovery.

As reported in SQL Server Transformation: Toward Agility and Resiliency[1], 94 percent of SQL Server professionals who responded to our survey reported having some level of virtualization in their environment:

- 70% of those using virtualization reported that VMware was their primary virtualization technology provider.[1]
- More than half of survey respondents—60%—reported rates of SQL Server virtualization of 75% or more.[1]

Further, survey results provide strong evidence that having high availability and disaster recovery implemented in the virtualization layer were important factors in the decision to virtualize SQL Server databases.

Virtualization with vSphere and Hyper-V

VMware provides virtualization for all the critical infrastructure components that SQL Server requires for high performance and consistent operations. It enables organizations to simultaneously optimize compute resources through server consolidation and maintain

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application flexibility through role isolation. SQL Server workloads can be migrated to new sets of hardware in their current states without expensive and error-prone application remediation, and without changing operating system (OS) or application versions or patch levels.

In addition to providing low-cost and consistent private cloud services for workloads, VMware is also now pioneering hybrid cloud operational models that span private and public cloud architectures.

For organizations looking to exploit the benefits of software-defined storage Microsoft offers Storage Spaces Direct is a cost-optimized storage solution that provides organizations with the performance and resiliency that they need to migrate and upgrade their high-performance databases. It uses industry-standard servers with local-attached drives to create highly available, highly scalable software-defined storage infrastructure. Its converged or hyper-converged architecture radically simplifies procurement and deployment, while features such as caching, storage tiers, and erasure coding, together with the latest hardware innovations such as RDMA networking and NVMe drives, deliver unrivaled efficiency and performance.

Dell EMC's modern infrastructure for virtualized SQL Server environments

Dell EMC and Microsoft have been partnering on solutions for SQL Server for decades. Successful implementation of a comprehensive database platform such as Microsoft SQL Server requires design coordination between the implemented software features and the underlying infrastructure. That infrastructure includes CPU processing power, memory resources, storage design, and networking service. For any type of application workload, Dell EMC is a single source for the essential infrastructure of your SQL Server platform.

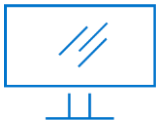
- For organizations looking to run SQL Server virtualized on VMware, Dell EMC released a white paper discussing how businesses can take advantage of best in breed Dell PowerEdge servers and Unity XT all-flash storage. The paper provides an overview of SQL Server 2019 and Dell EMC infrastructure in a VMware vSphere virtualized environment. It introduces key features of SQL Server 2019 and the newest Dell EMC series of midrange all-flash storage arrays—Unity XT. It includes best practices for configuring and managing the infrastructure components and virtualizing SQL Server.
- For organizations interested in software-defined storage, Dell EMC Engineering tested and validated a cluster configuration with SQL Server 2017 with Storage Spaces Direct Ready Nodes. It includes Dell EMC Data Domain DD6300 system with Data Domain Boost for Enterprise Applications (DDBEA) for database backup and recovery.

Component	Key Capabilities
Server  Featuring Dell EMC PowerEdge Family	For SQL Server to run efficiently on modern hardware, the SQL Server Operating System (SQLOS) must have a full understanding of hardware layout, including understanding relationships among cores, logical CPUs, and physical CPUs has become important. The Dell EMC PowerEdge server portfolio offers many combinations of CPU processor and memory configurations. The configurations are suitable for everything from small departmental applications to the largest mission-critical systems like enterprise resource planning (ERP), data warehousing, advanced analytics, eCommerce, and the full spectrum of custom applications.

Component	Key Capabilities
Storage  Featuring Dell EMC Unity XT	When it comes to virtualizing SQL Server, companies are looking for storage solutions that provide low latency, high throughput, and comprehensive data services for their SQL Server workloads. Flash storage has already changed the game in delivering high performance with consistent 1 millisecond or less latency for OLTP and OLAP workloads. In fact, in 2018, IDC reported an almost 55% increase year over year in total All Flash Array (AFA) market.[2] Dell EMC's storage portfolio provides high-capacity, high-performance, and reliable storage for both unstructured and structured data. This comprehensive storage product line complements the innovative SQL Server transition into a complete data hub.
Data Protection and Backup  Featuring Dell EMC Data Protection Suite and Data Domain	Dell EMC Data Protection Suite empowers application owners/database admins to backup directly to Data Domain through native utilities. Dell EMC Data Domain backup appliances reduce the amount of disk storage needed to retain and protect data by ratios of 10-55x and greater.[3] Dell EMC Data Protection software solutions accelerate backups up to 20x and recovery up to 10x faster for mission-critical applications.[4] It protects data and applications residing in on-premises traditional infrastructures to virtualized environments including public and hybrid clouds.
Hyper-converged  Featuring Dell EMC Solutions for Microsoft Azure Stack HCI	Built on software-defined compute, storage, and networking features of Microsoft Windows Server 2019, Dell EMC Solutions for Azure Stack HCI deliver a fully productized, validated and supported HCI solution that enables enterprises to modernize their infrastructure for improved application uptime and performance, simplified management and operations, and lower total cost of ownership. Dell EMC Solutions for Microsoft Azure Stack HCI encompass a wide range of Hyper-Converged Infrastructure configurations that are built on Dell EMC Microsoft Storage Spaces Direct Ready Nodes.
Additional Software for Simplified Management	
CloudIQ Integrated Dell Remote Access Controller	CloudIQ: A no cost, no maintenance cloud-based storage analytics application which uses near real-time intelligence, proactive monitoring, predictive analytics, and machine learning to deliver comprehensive health scores at-a-glance. Integrated Dell Remote Access Controller (iDRAC): Embedded within every Dell EMC PowerEdge server, it provides functionality that helps IT administrators deploy, update, monitor, and maintain servers with no need for any additional software to be installed. iDRAC functions regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state because it is embedded within each server from the factory. iDRAC alerts administrators to server issues, helps them perform remote server management, and reduces the need for physical access to the server.

The essential infrastructure of your SQL Server platform

Increasingly, organizations are virtualizing their SQL Server environments at some level. Although virtualization adds another layer of design, configuration, and monitoring to the architecture stack, it provides significant benefits. Dell EMC solutions provide a strong foundation for supporting these environments. By providing choice in platform deployment and consumption models for SQL Server, Dell EMC enables greater operational flexibility. From integrated virtualized infrastructure on vSphere and Hyper-V, to multi-cloud and hybrid-cloud deployments for Azure and Azure Stack, to containerized applications and databases on Linux and Windows, Dell EMC empowers customers to deliver accelerated response times to the business.



Learn More about Dell EMC Ready Solutions for Microsoft SQL

Contact a Dell EMC Expert

1. Source: Unisphere Research, "SQL Server Transformation: Toward Agility & Resilience", 2017 PASS Database Management Survey
2. Source: IDC, "Worldwide Enterprise Storage Market Grew 34.4% during the First Quarter of 2018, According to IDC", June 2018
3. Based on July 2018 Dell EMC internal analysis of >15,000 Data Domain systems deployed worldwide. The backup software used was Dell EMC Avamar. Actual results may vary.
4. Based on Dell EMC internal testing, July 2016 compared to traditional backup