ESG SHOWCASE

# Dell Technologies Converged/Hyperconverged Infrastructure Solutions for Microsoft SQL Server

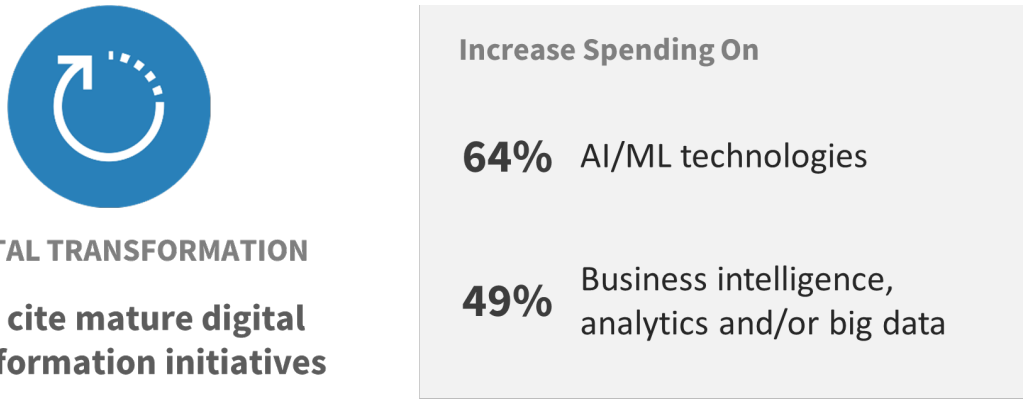
**Date:** March 2020 **Author:** Bob Laliberte, Senior Analyst; and Leah Matuson, Research Analyst

**ABSTRACT:** Digital transformation efforts are forcing organizations to become more operationally efficient. These organizations look to optimize Microsoft SQL Server environments and are actively modernizing their underlying legacy infrastructure to take advantage of the benefits provided by running SQL on innovative converged/hyperconverged infrastructure solutions. The Dell Technologies portfolio of solutions for converged and hyperconverged infrastructure is well suited to enable organizations to create a private cloud or hybrid cloud infrastructure, which delivers the flexibility, efficiency, scale, and performance required to enhance the latest Microsoft SQL Server deployments.

## Overview

Across industries, organizations are undergoing digital transformation—and it's not stopping. With data proliferating at a steady rate, organizations realize they must become more operationally efficient, delivering an enhanced and differentiated customer experience to maintain a competitive edge. According to ESG research, 19% of organizations state they currently have mature digital transformation initiatives, and 57% are in process or just beginning.[1]

**Figure 1. Digital Transformation Maturity**




*Source: Enterprise Strategy Group*

[1] Source: ESG Master Survey Results, *2020 Technology Spending Intentions Survey*, January 2020. All ESG research references in this showcase have been taken from master survey results set.

Additionally, to make sense of all that data, ESG research shows that 64% of IT professionals said their organizations will increase spending on AI/ML technologies, and nearly half (49%) said they will increase investment in business intelligence, analytics, and/or big data to effectively leverage the massive amounts of data collected (see Figure 1).

### Microsoft SQL Server

With today's increasingly challenging IT environment, thousands of organizations across virtually all industries depend on Microsoft SQL Server to meet the stringent requirements of mission-critical database workloads. The relational database management system is viewed by organizations as essential to supporting their business.

Prior SQL versions, such as SQL Server 2017, focused on developer enablement with Microsoft support for SQL Server on Linux and could be deployed in container platforms including Dockers, Kubernetes, and Open Shift.

Microsoft has added adaptive query processing, which presents new techniques for adapting SQL Server to specific application workload characteristics. In addition, organizations garner flexibility when deploying the database to support mixed workload environments. It's important to note that, as new versions of SQL Server become available, organizations must perform due diligence when it comes to upgrading their database infrastructure stack to support the newest features and functionality.

### Introducing Data Virtualization in Microsoft SQL Server 2019

With the vendor's most current version, Microsoft SQL Server 2019, Microsoft continues to underscore flexibility when deploying the database and supporting workloads, offering organizations a cohesive view of enterprise data via data virtualization.

Leveraging PolyBase, Microsoft SQL Server 2019 Big Data Clusters presents organizations with a comprehensive artificial intelligence (AI) and machine learning (ML) platform (via a secure integration between Microsoft SQL Server, Apache Spark, and HDFS), providing businesses with a significant opportunity to ingest, store, prepare, query, and analyze their virtualized data from a variety of data sources.

Regarding platform and language, organizations can enjoy freedom of choice—SQL Server 2019 offers support for Windows, Linux, and containers—providing flexibility for organizations already utilizing modern deployment approaches. SQL Server 2019 also offers scalable compute and storage for faster data processing, while added SQL Server 2019 security features include protection of data at rest and in use.

That said, while many organizations will be transitioning to SQL Server 2019 to take advantage of its new capabilities (e.g., big data clusters, data virtualization, and containerization), they must ensure they have the appropriate underlying IT infrastructure to truly achieve flexibility, resiliency, scalability, superior performance, enhanced data protection, simplicity, and efficiency of operations.

## IT Is Still Challenging, and Driving Modernization

IT environments have grown increasingly complex. Based on ESG research, nearly two-thirds of organizations (64%) report greater IT complexity than they experienced two years ago, most often citing higher data volumes as a reason for that complexity, with modern application architectures and advanced analytics among the top five most cited reasons as well.

Many organizations acknowledge that legacy infrastructures aren't well equipped to run either existing or new releases of SQL Server and the applications that SQL supports (e.g., high-performance and high-memory servers, and scale-up/scale-out persistent storage). In addition, countless data centers comprise a homegrown combination of basic server,

networking, and storage components—reinforcing legacy IT processes that result in inefficiency and lack of agility. Like legacy infrastructure, legacy operational models are out of step with today's fast changing business needs.

To remain successful, businesses must shift legacy IT operating expenses and headcount from inefficient legacy IT administration to fund IT innovation and create modern, cloud environments. Organizations understand that legacy operations teams are constrained by existing infrastructure. As a result, they respond too slowly to meet the demands of DevOps teams to deliver cloud-like, on-demand resources. Additionally; the shrinking pool of storage, server, and network professionals can't keep pace with accelerated infrastructure growth and the complexity it can bring. Thus, the strategic and financial rationale for multi-cloud deployment is driving the need for qualified staff with IT skills, including hybrid cloud operations and automation.

## Requirements for an Innovative, Scalable Infrastructure to Support Microsoft SQL Server

Organizations are seeing the importance of providing better and differentiated customer experiences—and the ability to provide a flexible, scalable, and performant underlying infrastructure is as critical as the database software itself. That being the case, organizations must look to a modern, scalable infrastructure that supports Microsoft SQL Server, satisfying the following criteria:

### Flexibility

The infrastructure must support:

- VMware virtualization, Windows, Linux, and Containers—aligning to the deployment flexibility that many organizations have already realized via hyperconverged infrastructure (HCI) and converged infrastructure (CI) deployments.
- Container platforms such as Docker, Open Shift, and Kubernetes. The infrastructure must support mixed workload environments, meeting the specific technical and business requirements of each workload.
- Adaptive query processing, which enables faster workload processing.

### Cost Effectiveness, Ease of Scale, and High Performance

The infrastructure must easily scale, rapidly adding compute or storage to accommodate additional processing or higher data volumes. The key is to accomplish this asymmetrically, scaling either the compute or storage independently based on need. The infrastructure must offer:

- Fabric support to optimize connectivity to all applicable workloads.
- Seamless connection to the cloud or other resources. This includes replication for a broad set of use cases including backup, long-term retention, disaster recovery, on-demand compute, and specialized services.
- Capacity for modeling big data in Hadoop Distributed Files System (HDFS) clusters, as well as relational and traditional databases.
- In-memory processing/computing, which allows for faster data processing/analysis.
- Performance at massive scale, regardless of the size of data sets.

### Reliable Data Protection, Simplified Management, and Resource Efficiency

Data is the backbone of every organization. This means that reliable protection of the company's key asset—data—is essential. The infrastructure must ensure:

- Data is not lost in the event of a component malfunction or catastrophic system outage.
- Data is encrypted (at rest and in transit) and safe from cyberattack.
- Appropriate recovery time objectives (RTOs) and recovery point objectives (RPOs) are based on the specific business requirements of each workload.
- Operations are simple and the organization can easily assess whether it is efficiently using IT resources to maximize return on investment (ROI).

Just as SQL Server 2019 provides a unified view of an enterprise's data coming from different sources, it is crucial that an organization's underlying infrastructure provides a unified approach to automating and orchestrating the compute, network, and storage environment, regardless of physical location. Just as important, infrastructure must support a hybrid cloud strategy without escalating the complexity of operations. Given that, where can organizations turn for flexible, cost-effective infrastructure that can satisfy a litany of essential requirements addressing the unique needs of their business?

## Dell Technologies Delivers Value for Microsoft SQL Server

### The Dell Technologies Portfolio of Converged and Hyperconverged Infrastructure Solutions

Converged and hyperconverged infrastructures enable organizations to prioritize consolidation of both database instances and hardware footprints. With organizations increasingly shifting to turnkey infrastructures to satisfy mission-critical database workloads, it's no surprise that the leader in CI/HCI offers solutions that provide simplicity, flexibility, resiliency, performance, scale, and cost savings. Dell Technologies offers complete, pre-integrated solutions, purpose built to support current and future SQL Server workloads—whether organizations are looking for a robust converged infrastructure in Dell EMC VxBlock System or Dell EMC PowerOne, or a software-defined hyperconverged solution in Dell EMC VxFlex or Dell EMC VxRail.

Microsoft-partnered offerings, such as Dell EMC Solutions for Azure Stack HCI, provide a fully productized, validated, and supported HCI solution, enabling enterprises to optimize their infrastructure for improved application uptime and performance, simplified management and operations, and lower total cost of ownership (TCO).

The Dell Technologies portfolio of converged and hyperconverged infrastructure solutions, featuring Intel® processors, supports the simplicity, flexibility, performance, efficiency, scalability, and protection required for Microsoft SQL 2019 deployments. These solutions comprise the requisite hybrid cloud capabilities and automation to drive higher levels of agility and productivity to improve business outcomes.

#### Dell EMC VxBlock System 1000

An all-on-one, three-tiered converged infrastructure system, VxBlock System 1000 encompasses a multi-technology architecture offering a wide variety of Dell Technologies storage arrays, data protection appliances, Cisco blade and rack servers, LAN/SAN switches, and VMware virtualization. The architecture assures consistent performance and high availability of SQL Server database instances and related applications.

Designed for consolidating SQL Server data estates, and offering a range of technologies, VxBlock System 1000 allows IT staff to assign and independently scale groups of devices to achieve workload-specific price/performance and data services—while leveraging economies of scale. The System's perpetual design allows users to continuously incorporate new technologies to further optimize SQL Server workloads. Integration with VMware tools offers holistic system management, analytics, and automation for SQL.

### Dell EMC PowerOne

PowerOne is a turnkey, three-tiered converged infrastructure system offering a very high degree of automation for autonomous (near-zero touch) operations, and a flexible consumption model for a data center cloud-like operational experience. Components comprise Dell Technologies "power branded" high-performance, feature-rich servers and storage arrays, network switching, and data protection products for optimizing SQL Server workloads. Intelligent automation eliminates nearly all traditional manual administrative tasks: launch, expand, reallocate, and upgrade (lifecycle manage), resource groups (VMs, compute, storage, and network fabric) for the SQL Server database and associated applications. To attain optimal TCO, Dell EMC offers flexible consumption models, including metered, cloud-like elastic capacity, to allow organizations to align spending with usage.

### Dell EMC VxRail

Leveraging the Dell Technologies family mantra of "Better Together," VxRail is a jointly engineered turnkey solution powered by Intel® Xeon® Scalable Processors that consolidates server, storage, networking, and virtualization, pretested with VMware HCI solutions (vSAN or VMware Cloud Foundation). Automated full stack, end-to-end lifecycle management and integration with Smart Fabric decreases fabric deployment times. VxRail can now be augmented with GPUs, NVMe, and RDMA technologies to meet the needs of extremely demanding mission-critical workloads such as SQL Server.

### Dell EMC VxFlex Family

A software-defined storage platform designed to significantly reduce operational and infrastructure complexity, VxFlex enables organizations to move more swiftly by delivering flexibility, elasticity, and simplicity with predictable performance and resiliency at scale. The VxFlex family provides a solid foundation that combines compute and high-performance storage resources in a managed unified fabric. VxFlex is available in flexible deployment options—integrated rack, appliance, or Ready Nodes—which enable Server SAN, HCI, and storage-only architectures. This architectural choice allows you to optimize how you deploy your infrastructure while minimizing TCO and software licensing expenses. VxFlex provides comprehensive IT Operations Management (ITOM) and Lifecycle Management of the entire infrastructure stack, reducing IT complexity. VxFlex is ideal for high-performance applications and databases such as SQL Server 2019, when building an agile private cloud, or consolidating workloads in heterogeneous environments.

### Microsoft Azure Stack HCI

Working with Microsoft, Dell offers a variety of solutions for deploying Microsoft SQL Server 2019 with the Microsoft Azure Stack portfolio. Starting with as few as two nodes, and scalable to 16 nodes, these solutions are appropriate for edge locations as well as data centers, such as Dell EMC Solutions for Microsoft Azure Stack HCI. Microsoft Azure Stack solutions leverage Dell PowerEdge servers with Intel® Xeon® Scalable processors, integrating compute, networking, and storage in the same cluster. With options for NVMe, organizations can satisfy the requirements of their high-performance SQL Server applications.

## Data Protection and Uptime

Uptime is vital when dealing with a mission-critical database. With Dell Technologies, organizations access a Data Protection Suite that can enhance all aspects of the application lifecycle—from faster backups and recovery, to reliable protection of data and applications that span on-premises infrastructure, virtualized environments, and public and hybrid cloud. Combined with the Dell EMC PowerProtect DD Series appliances, database administrators benefit from Application Direct to Data Domain functionality with native tools, reducing the amount of disk storage necessary to retain and protect all data.

## The Bigger Truth

Organizations looking to optimize existing SQL 2017 or new SQL 2019 deployments must consider modernizing their underlying infrastructure, transitioning from a siloed, legacy infrastructure model to one which enjoys the advantages of converged and hyperconverged infrastructure solutions. The Dell Technologies portfolio of solutions for converged and hyperconverged infrastructure is well suited to answer the needs of organizations looking to create a private cloud or hybrid cloud infrastructure, which enables the flexibility, efficiency, scale, performance, protection, and simplicity required to support Microsoft SQL Server environments.

Learn more about Dell Technologies Converged Infrastructure solutions for Microsoft SQL:
http://DellTechnologies.com/CI-for-SQL

Learn more about Dell Technologies Hyperconverged Infrastructure solutions for Microsoft SQL:
http://DellTechnologies.com/HCI-for-SQL



**Enterprise Strategy Group** is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

www.esg-global.com contact@esg-global.com 508.482.0188