

## ESG SHOWCASE

# The Dell Technologies Storage Infrastructure Enables Microsoft SQL Server Environments

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**ABSTRACT:** Modern business is built on data. As a result, companies are investing more money and effort into gaining insights from that data—modernizing their business-critical applications to meet the demand for faster, more accurate insights. For example, they are looking into the database workload Microsoft SQL Server, which now features innovations to improve its performance and portability, plus an expanded ability to deliver crucial business insights based on structured and unstructured data. That type of IT modernization does increase IT complexity, however. That's why Dell Technologies is empowering IT organizations to maximize the value of their SQL Server environments through tools that augment SQL Server's capabilities while simplifying any associated complexities.

## Overview

We are witnessing the rise of the digital business, and along with it, the huge role that information plays in fueling business opportunity. Business leaders have made it a pervasive goal to capture those opportunities, aiming to achieve competitive success. Line-of-business (LOB) executives are putting a lot of pressure on IT right now, and unfortunately, they aren't universally happy with the amount of help they're getting.

Only 6% of the LOB executives ESG surveyed view their company's IT group as a competitive facilitator/differentiator for the business. A larger 25% of those LOB execs actually regard IT as a business inhibitor. Among executives who believe IT is inhibiting business success, 43% of them said it's because workers have too much difficulty accessing the data they need for business operations and analysis.<sup>1</sup>

A solution to that issue may center on Microsoft SQL Server, which in its latest version (SQL Server 2019) has become a powerful tool for leveraging big data, unstructured data clusters, and Linux container-based environments. Those capabilities are all incredibly beneficial, but like most innovations, the additions can make life more complex for storage admins. For instance, SQL environments have historically been Windows-based—not Linux-, container-, or Kubernetes-based.

Additionally, SQL Server is only going to be as strong and useful as the infrastructure supporting it. Thankfully, [Dell Technologies](#) provides a breadth of storage infrastructure options that feature advanced performance and scalability attributes suited for SQL Server 2019 and legacy SQL Server versions. These systems are optimized to support the data demands of modern SQL Server environments and to empower IT with tools that enable them to help the rest of the business find and utilize data more effectively.

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<sup>1</sup> Source: ESG Master Survey Results, [2019 Technology Spending Intentions Survey](#), March 2019.

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## Architecting Modern Microsoft SQL Environments for Superior Business Outcomes

SQL Server 2019 went GA in November 2019 with a drastically different, very modern application architecture. Of course, SQL Server has long been ubiquitous in the midmarket, and at many large enterprises, different SQL Server versions are in use. With its recent updates, SQL Server 2019 is optimized to deliver expedited access to insights for LOB teams. As mentioned, the inability to get needed data (or the inability to get it fast enough) negatively impacts people's perceptions of IT. That problem urgently needs a solution: 29% of IT decision makers surveyed by ESG expect that improving data analytics for real-time business intelligence and customer insight will be a top-five business initiative driving spending for them over the next 12 months.<sup>2</sup>

Analytics-related investments are intended to support multiple business objectives tied to improving efficiency and execution. In a study of 310 IT and LOB professionals who are responsible for/familiar with big data, databases, business intelligence, data warehouse and/or data analytics for their organizations, the most commonly identified business initiatives driving organizations' business-data analytics strategies were improved operational efficiency (53%) reduced costs of business operations (47%), improved business decisions and strategy (46%), improved quality of products/services (44%), and improved forecasting accuracy (39%).<sup>3</sup>

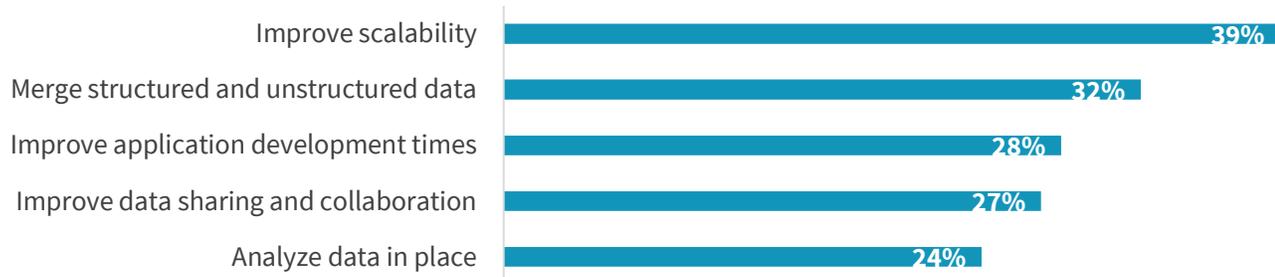
In the same study, participants recognized SQL Server's ability to support those objectives. For example, 37% of the respondents identified SQL databases as technology to be leveraged as part of their data pipeline for analytics initiatives. (It was the most common response.) Some of SQL Server's recently incorporated capabilities, such as the integration of structured and unstructured data and support for Linux container-based environments, further empower businesses to improve efficiency, operations, and decision making. But for storage administrators, those capabilities can add complexity.

### Integration of Structured and Unstructured Data

Microsoft designed SQL Server 2019 in part to enable businesses to gain better insights from multiple data sets (such as unstructured data and data lakes), while making data integration projects easier. That addition fills a key need because a majority of study participants (60%) leverage a mix of unstructured and structured data for analytics.<sup>4</sup> Integration of multiple data types, such as with data lake environments, supports multiple objectives (see Figure 1) such as improving data scalability (39%), merging structured and unstructured data (32%), improving application development times (28%), improving data sharing and collaboration (27%), and analyzing data in place (24%).<sup>5</sup>

**Figure 1. Top Five Objectives for Utilizing a Data Lake Technology**

**What are or will likely be your organization's objectives for utilizing a data lake technology solution? (Percent of respondents, N=310, multiple responses accepted)**



Source: Enterprise Strategy Group

<sup>2</sup> Source: ESG Master Survey Results, [2020 Technology Spending Intentions Survey](#), January 2020.

<sup>3</sup> Source: ESG Master Survey Results, [The State of Data Analytics](#), August 2019.

<sup>4</sup> *ibid.*

<sup>5</sup> *ibid.*

IT organizations should take note that given recent increased demands for near-real-time insights and the desire to analyze data in place, access to file content will be best served by a low-latency, highly performant, highly scalable storage infrastructure.

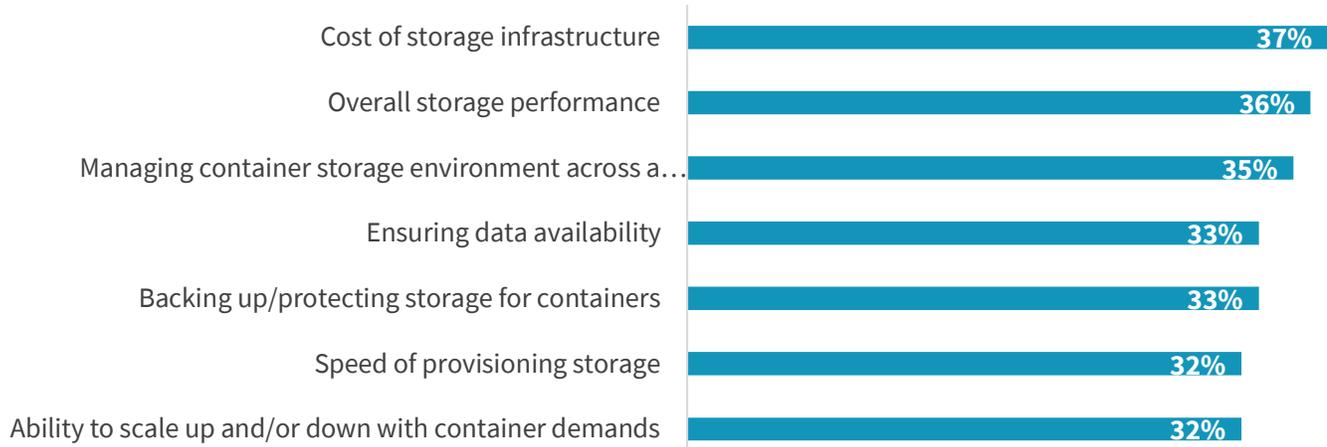
### Microsoft SQL Server Support for Linux Container-based Environments

Microsoft engineered SQL Server 2019 to work in Linux container-based environments. That new capability provides greater application portability and makes application deployments more efficient, while making SQL Server more “developer friendly.”

But containers are ephemeral by nature. Applications running on SQL Server 2019 demand persistent data, and IT can spin up a container quickly (thus achieving that desirable level of application portability). However, for the underlying storage infrastructure, containerized workloads can cause issues related to performance, provisioning speed, the ability to scale up and down, and more (see Figure 2).<sup>6</sup>

**Figure 2. Top Seven Persistent Storage-related Challenges with Containers**

**In general, what would you say are your organization’s biggest persistent storage-related challenges in terms of its container-based environment? (Percent of respondents, N=274, multiple responses accepted)**



Source: Enterprise Strategy Group

Businesses are asking their already-thin IT staffs to stretch themselves further to incorporate SQL Server 2019’s new innovations. According to ESG research, 29% of IT organizations that have seen IT complexity rise in the past two years specified that increases in the number of applications leveraging modern architecture are a big root cause.<sup>7</sup> Selecting the right infrastructure partner can help reduce the risk and complexity associated with designing and deploying an optimized storage infrastructure environment for SQL Server 2019.

### Why Dell Technologies Storage for Microsoft SQL Server 2019?

Everyone knows Dell Technologies is a leader in data storage technology, but not everyone knows that Dell Technologies has been building a portfolio of storage options to maximize the potential of SQL 2019. That portfolio, including the new

<sup>6</sup> Source: ESG Master Survey Results, [2019 Data Storage Trends](#), November 2019.

<sup>7</sup> Source: ESG Master Survey Results, [2020 Technology Spending Intentions Survey](#), January 2020.

Dell EMC PowerStore systems (for block and file), Dell EMC PowerMax (for the most demanding environments), and Dell EMC Isilon (for unstructured data) collectively address all Microsoft SQL Server storage-related needs. These systems:

- Provide a high-performance infrastructure for structured and unstructured data.
- Help to expedite delivery of insights to different business groups.
- Include support for container-based environments.

They feature all the capabilities organizations expect from enterprise storage that supports mission-critical workloads—thin provisioning, data reduction, intelligent snapshots, data-at-rest encryption, replication, and quality of service (QoS). They don't stop at offering those benefits to the new SQL Server 2019 platform; they also allow the IT organization to consolidate all legacy versions of SQL Server used by the business onto one platform.

For performance, Dell Technologies incorporated NVMe-based flash storage into all three systems. ESG has conducted extensive research into the benefits of flash; findings indicate that NVMe performance could be practically essential to enabling SQL workloads now. A combined 93% of flash storage users surveyed by ESG are either currently using (35%), planning to use (36%), or interested in using (22%) NVMe-based flash storage. The two most common drivers behind their high usage of and interest in NVMe: “Future proofing” their environments to support new application requirements (56%), followed by a need to accelerate existing applications (55%).<sup>8</sup>

Dell Technologies engineered PowerStore, PowerMax, and Isilon with product-specific advances to support SQL Server 2019 and help IT organizations consolidate legacy SQL versions. Specifically:

- **Dell EMC PowerStore:** PowerStore leverages Intel® Xeon® Scalable Processors and Dual Port Intel® Optane™ SSDs to improve performance while delivering enterprise-level storage services as a standalone appliance or in clustered multi-appliance scale-out mode. PowerStore also supports **Intel® QuickAssist Technology**, which, according to Dell Technologies, provides 40 Gbps of total throughput to handle hardware-based data compression. That capability frees SQL Server from the burden of compression, which means CPU cycles can be recouped to support other operations. PowerStore also offers an onboard VMware ESXi hypervisor, offering flexibility to deploy a SQL application closer to a data store.
- **Dell EMC PowerMax:** PowerMax also leverages Intel® Xeon® Scalable Processors and is designed to offer 99.9999% availability per array. It also offers, according to Dell EMC, less than 100 microsecond read latency delivered with an end-to-end NVMe architecture that supports flash-based NVMe and storage class memory (SCM) with Dual Port Intel® Optane™ SSDs for an incredibly high level of performance density. Machine learning is also built into PowerMax, helping to ensure that SQL Server applications are optimized for efficient operation.
- **Dell EMC Isilon:** Isilon supports SQL through SQL's PolyBase connectivity through Hadoop Distributed File System (HDFS) tiering to leverage data in place. This feature allows for in-place analytics, eliminating the time, cost, and complexity associated with moving large volumes of data to a separate infrastructure environment.

With its broad and robust storage portfolio, Dell Technologies helps simplify the design and deployment of a multi-data type (block, file, object) enterprise storage environment for SQL Server. Dell Technologies also offers additional assistance

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<sup>8</sup> Source: ESG Master Survey Results, [2019 Data Storage Trends](#), November 2019.

via prescriptive guidance, automation, and scripts to further expedite infrastructure deployment and provisioning, including support for Red Hat Ansible.

## Dell Technologies Expedites SQL Data Accessibility and Insights

A technology called Integrated Copy Data Management, or iCDM, developed by Dell Technologies, enables consolidation of primary SQL Server data and associated copies on the same scale-out all-flash array. It's important to get copies of SQL Server production databases to multiple stakeholders fast—enabling different teams to collect businesses insights—while also helping developers test new versions of software. iCDM supports those efforts.

Dell Technologies also offers Dell EMC AppSync, which frees up IT admins' time and addresses IT complexity by simplifying and automating the process of generating and consuming production data copies. With AppSync, application owners obtain data by themselves (e.g., for repurposing or recovery) across multiple arrays and applications via a single user interface.

## Storage Designed, Optimized, and Validated for Container-based Environments

Dell Technologies' innovations optimize and simplify storage for containers. Persistent storage for containers needs to maintain data availability through the restarting or rescheduling of a container, whether on the same host or a different physical system. Dell Technologies offers a CSI plug-in for its storage solutions to ensure that persistent data is managed effectively for container-based environments. The plug-in is available on [GitHub.com/Dell](https://github.com/Dell).

## The Bigger Truth

Modern applications such as SQL Server 2019 are changing what data can do for modern businesses. While businesses see potential for faster decisions, better execution, and superior efficiency, IT is tasked with making it all work. Instead of taking the added complexity of integrating big data clusters or Linux containers alone, IT organizations can reduce complexity by working with a single partner that has the technology and expertise to make everything work quickly and easily.

Dell Technologies offers an incredibly rich and broad storage portfolio to address a diverse set of block, file, and object data. Powered by Intel, this storage portfolio is optimized to deliver the low-latency performance necessary to expedite deployment of new SQL Server databases while consolidating existing demand. For example, the new Dell EMC PowerStore systems leveraging Dual Port Intel® Optane™ SSDs incorporate hardware-based compression support.

Together, Dell Technologies, Intel, and Microsoft SQL Server form a can't-miss combination when building an ecosystem to support a business's digital objectives—with the right technology, in the right place, to achieve the right outcomes.

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