ESG WHITE PAPER

Embracing Data Virtualization with Microsoft SQL Server and Dell Technologies

Modern Data Management on a Modern Infrastructure Stack

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Introduction

Organizations across industries continue down the digital transformation path. ESG research shows that while 19% of organizations view themselves as having already implemented and optimized several digital transformation initiatives, a majority (57%) of organizations are still on the path, with 18% still in the planning stages.[1] Whether modernizing infrastructure, adopting cloud technologies, or becoming more data-driven, organizations are continually looking for ways to become more operationally efficient and agile in order to respond to the dynamic, real-time needs of the business.

Embracing a Data-centric Culture

In today's dynamic business environment, organizations are seeking ways to evolve and to become the disruptor—as opposed to the disrupted. Companies are investing in technology to utilize their data to stay current, gain and maintain a competitive edge, and provide an improved user experience.
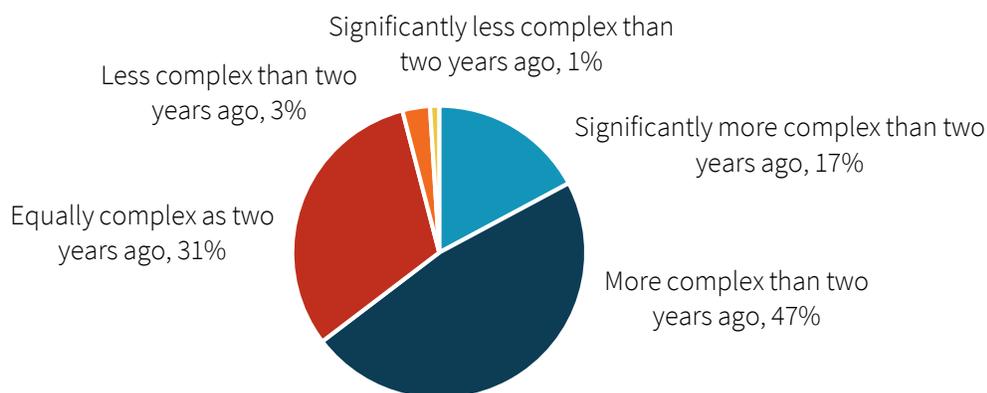
ESG research shows that 29% of organizations believe that improving data analytics for real-time business intelligence and customer insight is one of the key business initiatives that will drive the most technology spending in their organizations over the next 12 months. In fact, nearly half (49%) of organizations surveyed said they will increase their spending in business intelligence, analytics, and/or big data in 2020.

IT Still Isn't Getting Any Easier

While many organizations would like to jump in feet first, pursuing their goal of becoming AI-driven, data-centric companies, most need outside assistance. Why? Digital transformation efforts can create IT complexity. According to ESG research, nearly two-thirds (64%) of IT professionals say IT is more complex compared to two years ago (see Figure 1), and those organizations with mature digital transformation initiatives are 3x more likely than those with no digital transformation initiatives (29% versus 9%) to say IT is significantly more complex today. While the growth of devices, data, and applications factor into that complexity, digital transformation and data-driven initiatives further exacerbate the complexity. Organizations understand the need to use next-generation technology, like containers for increased agility and artificial intelligence to increase insight into growing data sets, but existing infrastructure and workflow complexities are preventing them from recognizing the value they hope to gain from these strategic investments.

Figure 1. IT Complexity

In general, how complex is your organization's IT environment relative to two years ago?
(Percent of respondents, N=658)

Significantly less complex than two years ago, 1%

Less complex than two years ago, 3%

Significantly more complex than two years ago, 17%

Equally complex as two years ago, 31%

More complex than two years ago, 47%

Source: Enterprise Strategy Group

[1] Source: ESG Master Survey Results, *2020 Technology Spending Intentions Survey*, January 2020. All ESG research references and charts in this white paper have been taken from this master survey results set, unless otherwise indicated

Skills Shortages

While hiring staff is a priority, tight budgets and lack of available talent in the job market make it difficult to find talent. In fact, nearly one-third (32%) of IT decision makers said that their IT organization had a problematic skills shortage in the area of IT architecture and planning.

So where can organizations turn for assistance? ESG research shows that IT professionals will increase their usage of third-party professional services to cope with their shortage of skills over the next 12 months in key areas including IT architecture/planning (72%), artificial intelligence/machine learning (67%), data analytics/data science (66%), and database administration (55%).

Technologies of Choice

Regardless of the continuing complexity of IT, and the shortage of employees possessing skills in critical areas, organizations are still forging ahead, looking for an efficient, sustainable way to grow and maintain a competitive edge. Given that, in which data analytics technologies are organizations looking to invest? As one might expect, they're investing in tools that leverage artificial intelligence (34%), enable real-time business intelligence (30%), and aid data integration (28%). Essentially, organizations are investing in databases, data warehouses, and analytics solutions that can enable rapid response to the dynamic nature of the business.

Organizations looking to use a modern database to support a data-centric vision require a foundational infrastructure that supports both the current—and future—demands of the business (think scale, speed, agility, protection, security, flexibility, and cost).

Prioritizing Data Virtualization with Microsoft SQL Server

Today, a common bottleneck slowing down how organizations can gain insights is associated with comprehensive data management and orchestration: Where is the data I need? Where does it need to be moved? Can it be moved? How long is it going to take before I can start analyzing the data? Is it protected in the event it becomes compromised or corrupted? Will it impact others if I move/copy the data? All of these questions are driving the need for data virtualization, which refers to abstracting data, regardless of structure, from different sources (relational data stored in databases, or big data stored in HDFS clusters, for example) across different locations into a single layer that can be queried from a single interface in real time. And the key is that it eliminates the need to copy or move the data. In other words, less copies of the same data means a reduction in storage costs and simplified management.

Microsoft SQL Server

Relied upon by thousands of organizations to satisfy mission-critical database workloads, SQL Server functions as the lifeline of many businesses and, as such, the supporting infrastructure is as critical as the database software itself. As new versions of SQL Server are made available, organizations must be smart about upgrading their database infrastructure stack to support the newest features and functionality.

Today, many organizations leverage SQL Server 2017. SQL Server 2017 focuses heavily on developer enablement with Microsoft support for SQL Server on Linux—it can be deployed in container platforms such as Docker, Open Shift, and Kubernetes. Microsoft has added adaptive query processing, which introduces new techniques for adapting SQL Server to specific application workload characteristics. Additionally, organizations gain flexibility when deploying the database and supporting mixed workload environments.

Introducing Data Virtualization in Microsoft SQL Server 2019

With its most current version, Microsoft SQL Server 2019, Microsoft has continued to emphasize flexibility when deploying the database and supporting workloads, offering organizations a unified view of enterprise data through data virtualization. Leveraging PolyBase, Microsoft SQL Server 2019 Big Data Clusters presents organizations with a complete AI and machine learning platform, via a secure integration between Microsoft SQL Server, Apache Spark, and HDFS—providing a greater opportunity to ingest, store, prepare, query, and analyze their virtualized data from a variety of data sources.

When it comes to platform and language, organizations can enjoy freedom of choice—SQL Server 2019 offers support for Windows, Linux, and containers—aligning to deployment flexibility that many organizations have already realized from modern deployment approaches. SQL Server 2019 offers scalable compute and storage for faster data processing, and organizations can now garner benefits from additional SQL Server 2019 security features, such as protection of data at rest and in use.

Data Virtualization Needs a Modern Infrastructure

It has become nearly impossible to satisfy the real-time needs of the business with older and siloed architectures consisting of disparate legacy components and systems from a variety of vendors on different upgrade cycles. Consequently, organizations are seeking better, more efficient ways to align their infrastructure with their database requirements and initiatives. Today, many organizations have suffered through roadblock after roadblock as they try to scale to meet performance demands, improve deployment times, and simplify system management, while enabling analysts to access data faster from edge to core to cloud for near real-time business insight. Organizations need a solution that can satisfy a litany of demands. The solution must: easily scale to meet constant data growth, enable performance that aligns to customer expectations, provide always-on availability, integrate seamlessly with hybrid cloud environments, reduce costs, and enable faster, more flexible deployments to meet DevOps requirements.

When it comes to the infrastructure used to support databases, ESG research shows the most important attributes of the database infrastructure include performance, security, reliability, cost (ROI/TCO), scalability, and flexibility. In addition, organizations need to partner with vendors that possess expertise across the stack—from hardware to software, to support and services. The right partner can assist an organization transform to become more data-driven—based on the organization's terms, not those of the partner. Further, the right partner must have proven capabilities, and the expertise to support present and future data-centric visions and initiatives. Enter Dell Technologies.

Dell Technologies Portfolio

As organizations look to embrace a data-centric mantra, Dell Technologies is leading the way—providing the right combination of tools, technologies, solutions, and services to enable rapid business transformation by infusing data insights and decision making throughout enterprise-wide workflows.

Dell Technologies innovation and partnerships with key technology companies allow organizations to gain access to modern infrastructure components and educational tools, helping to ensure success as they embark on their data-centric journeys.

For those organizations that rely on Microsoft SQL Server technology, it's important to note that the Microsoft and Dell Technologies partnership has existed for more than 30 years. These vendors have worked closely and diligently, and continue to do so, providing pretested, pre-validated, and fully integrated solutions engineered to supply optimized

performance—not just for Microsoft SQL Server but for additional Microsoft technologies such as Microsoft Azure Stack Hub and Microsoft Azure Stack HCI.

Across the entire Dell Technologies family, Microsoft has delivered more than 16,000 certifications for deployment, customer support, maintenance, training, and consulting. Additionally, the business has been granted 16 global competencies from Microsoft. The combined expertise and experience positions Dell Technologies at the forefront of enabling organizations to embrace modern approaches to storing, moving, accessing, analyzing, and protecting their most valuable asset: data.

While SQL Server can manage a global data footprint across platforms, whether on-premises or in the cloud, Dell Technologies offers a complete, proven infrastructure stack, along with consulting services that help support an organization's SQL Server journey as it migrates to the latest version of SQL Server.

Whether upgrading an existing database or the infrastructure stack, or just getting started with the latest version of SQL Server, organizations need (and appreciate) guidance based on their specific goals. Regardless of where an organization may be in its journey, the platform it is using, or its preferred tools and languages, organizations gain peace of mind knowing Dell Technologies Consulting Services can help.

Dell Technologies Consulting Services

From start to finish, Dell Technologies Consulting Services experienced consultants can assist organizations in building a foundational set of goals and help to develop a roadmap for modernization. As part of these services, organizations receive a comprehensive assessment that incorporates discovery workshops, interviews, and thought leadership to provide organizations with the guidance they need to create the right data management strategy tailored to their unique needs. Services include:

- Assist organizations identify long-term goals and create an actionable roadmap, benefits analysis, and migration priority map, based on workload importance. Organizations will document their existing SQL Server environment including the current state of the entire hardware stack, associated workloads, and configurations.

- Inventory and classify those applications that align to SQL Server databases and all dependencies, studying connections, integrations, reporting, ETL processes, and eventual outcomes.

- Group and prioritize SQL Server databases or instances by application group and develop a near-term modernization plan and roadmap for modernization. At this time, organizations may want to consider their consolidation opportunities.

- Establish a rough order of magnitude for future-state compute, storage, and software requirements to support an organization's modernization plan, as well as provide plans to continue to support end-of-support databases.

In addition, Dell Technologies Consulting Services can migrate an organization's data to a target of choice, fully aware that the targeted infrastructure stack must be flexible enough to build intelligent applications on any data, any platform, in any language—on-premises and in the cloud. Dell Technologies Consulting Services consultants also assist upgrades, re-platforming, and/or consolidating infrastructure to ensure predetermined goals are met.

Comprehensive Portfolio of Modern Infrastructure, Software, and Services

Compute

The Dell EMC PowerEdge family provides freedom of choice and simple scalability for organizations to select and grow the ideal server with the ideal combination (and type) of processing power and memory. Whether looking to support mission-critical applications that serve as the backbone of the business, such as OLTP databases or data warehouses, or simply address database-centric applications on which smaller lines of business rely, Dell EMC PowerEdge offers varying price and performance options to ease organizations into modernizing their Microsoft SQL deployments.

Dell EMC PowerEdge Servers with Intel® Optane™ DC Persistent Memory help accelerate data-intensive applications. Intel Optane DC is an innovative memory technology that delivers a unique combination of cost-efficient large capacity and support for data persistence. This is a new class of memory and storage that can accelerate insights from the massive amounts of data companies manage today.

Storage

To address growing data sets and the speed and scale of dynamic SQL Server workloads, low latency, high throughput, and scale-up and -out capabilities are essential. Flash storage is becoming the default ask of customers looking to address the high-performance demands of their SQL Server deployments. The Dell Technologies storage portfolio provides high-capacity, high-performance, and reliable storage for both unstructured and structured data, meaning it is tightly aligned to SQL Server 2019's vision of enabling a unified view of all data, regardless of type, size, and rate of change.

Networking

Dell Technologies' vision for the network is based on a disaggregated model offering an open ecosystem in which organizations can select from a wide range of innovative, industry-standard network applications, operating systems, and hardware platforms. This approach gives customers maximum control over the technologies that they choose and the architectures that they adopt, resulting in measurable cost savings and increased service agility.

Converged and Hyperconverged Infrastructure

Converged and hyperconverged infrastructures are enabling organizations to prioritize consolidation of both database instances and hardware footprints. With a growing number of organizations looking to turnkey infrastructures to satisfy mission-critical database workloads, it should come as no surprise that the leader in CI/HCI offers solutions that cater to simplicity, flexibility, 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 PowerOne or Dell EMC VxBlock System, or a hyperconverged solution in VxRail or XC Series. Additionally, Microsoft-partnered offerings, such as Dell EMC Solutions for Azure Stack HCI, provide a fully productized, validated, and supported HCI solution, which enables enterprises to modernize their infrastructure for improved application uptime and performance, simplified management and operations, and lower total cost of ownership.

Data Protection and Backup

For a mission-critical database, uptime is critical. With Dell Technologies, organizations gain a Data Protection Suite that can enhance all aspects of the application lifecycle, from faster backups and recovery, to protection of data and applications that span on-premises infrastructure, virtualized environments, and public and hybrid cloud. Combined with Dell EMC PowerProtect DD series appliances, database administrators can benefit from Application Direct to Data Domain functionality with native tools to reduce the required disk storage needed to retain and protect all data. The PowerProtect

DD series is based on Dell PowerEdge servers, which utilize Intel®-based processors that provide intelligent hardware-assisted compression and, according to the vendor, as much as 30% more logical capacity and performance improvement.

The Bigger Truth

As growing numbers of organizations continue down the digital transformation path, they're dealing with more data from more sources than ever before—and data democratization is critical to enabling a data-driven business. Data must be used across the business to fuel innovation, insight, and action—but traditional technologies fall short in enabling success—especially when it comes to data silos. Between data silos and the complexity and gravity of data, it's virtually impossible to resolve the data silo problem with a traditional approach, so organizations are being forced to rethink their approach to empowering the masses to leverage data.

Data virtualization offers an approach that can improve data access, minimize data copies/movement, simplify management, and enable a new wave of end-users to analyze data that matters to their specific goals. Organizations need to look to modern infrastructure to support a data-centric vision that supports the current and future demands of the business (think scale, speed, agility, protection, security, flexibility, and cost).

With that in mind, Dell Technologies and Microsoft are leveraging their proven 30-plus-year track record, expertise, and collaboration to deliver an approach that can truly enable data democratization in the enterprise. With SQL Server 2019, Microsoft has continued to underscore flexibility when deploying the database and supporting workloads, as well as provide organizations with a unified view of enterprise data through data virtualization. And while SQL Server can manage a global data footprint across platforms, on-premises or in the cloud, Dell Technologies offers a comprehensive infrastructure stack to run the technology, in addition to its consulting services that help support an organization's SQL Server journey as it migrates to the latest version of SQL Server.

To learn more about Dell Technologies' solutions for Microsoft SQL Server, please visit: https://www.delltechnologies.com/sql

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