

Winning in the New Era of Data Management

How Dell Technologies and the Microsoft Intelligent Data Platform are transforming data management for the data-driven era

Welcome to the data-driven era.

The data-driven era has brought with it the need for a new approach to data management. To remain competitive, you need to be able to harness petabytes of data from a variety of sources and in a variety of formats and convert them into meaningful insights. This puts pressure on IT organizations, which are quickly recognizing that the current methods of data management — based on running traditional data warehouses and databases on isolated infrastructures — are no longer adequate to advance the business toward achieving its goals.

In this paper, we explore how data management and analytics are evolving and how the Microsoft® Intelligent Data Platform, which includes Microsoft SQL Server®, is evolving in tandem to meet changing business requirements for accessing and analyzing data. We will discuss how you can take advantage of the latest Microsoft enhancements in concert with the Dell Technologies vision for a holistic approach toward managing your overall data estate — across hybrid and multicloud environments and at the edge.

The new Microsoft SQL Server capabilities discussed require new skills and potentially updated infrastructure. We will explore these in greater depth, along with a wealth of Dell Technologies published solutions, validated designs, best practices guidance and professional services available to assist in the evolution of your data estate.

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The emergence of the intelligent data estate

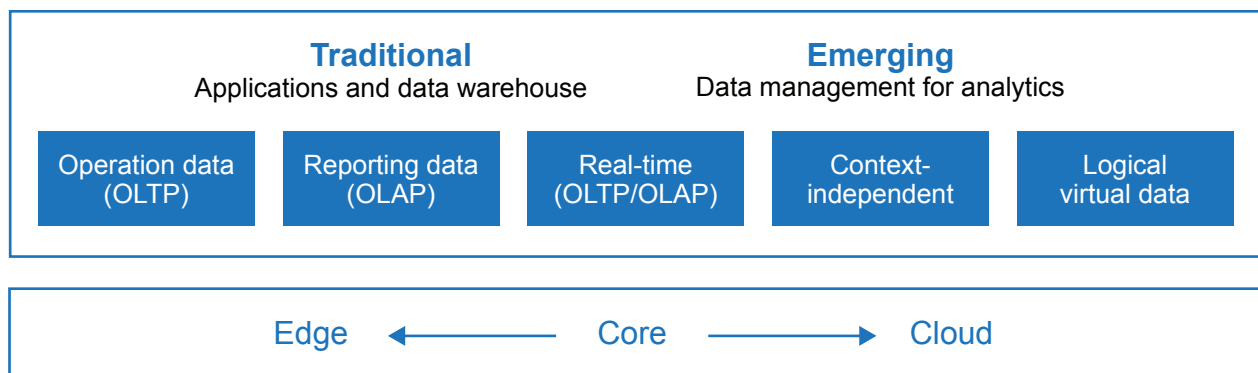
The evolving role of relational database management systems

Nearly every industry is being disrupted by new data sources and the emerging technologies that promise to harness them, like artificial intelligence (AI), machine learning (ML) and deep learning (DL). With information being one of an organization's most valuable assets, the advantage goes to those that can quickly harness data from a growing number of sources to provide actionable insights faster and more cost-effectively than the competition.

Savvy IT leaders know that this new, data-driven era requires a modern approach to data management and application design. One that replaces monolithic, siloed databases with new and improved models for using, sharing and managing data across the organization regardless of location. As hybrid and multicloud adoption continues to increase, mobile devices proliferate and Internet of Things (IoT) significantly expands, data is amassing in large quantities outside the confines of the traditional data center.

To understand the impact of data proliferation on IT strategies, it's important to understand the context for how traditional relational database management systems (RDBMSs) have evolved. RDBMSs have long been the backbone for operational data (online transaction processing, or OLTP) and traditional data warehouses (online analytics processing, or OLAP), supporting reporting and some analytics. However, as organizations look for ways to unlock the insights hidden in their data — across different platforms and environments — database management solutions have evolved to include additional, emerging analytics methods.

Traditional and emerging use cases



This critical change in database management strategy by large vendors inspired Gartner to define a new category, called Data Management Solutions for Analytics (DMSA) in 2019, which they updated in 2020 to Cloud Database Management Systems, a category in which Microsoft is still recognized as a leader.¹

Designing and building the best solution for your data estate — from edge to core, and from on-premises to multiple clouds — requires a combination of the right expertise and infrastructure. Not the “one size fits all” approach of the past, but a consumable, flexible and scalable approach that builds on current investments while preparing you for a successful digital future. An approach that addresses data management, data placement and data security.

Microsoft and Dell Technologies have partnered for over 35 years to deliver solutions and services to support your needs today and move your business forward to tomorrow. Our joint solutions integrate best-in-class software, hardware and services in secure, innovative and scalable solutions that help you wherever you are in your data transformation journey.

¹ Gartner, “[What are Cloud Database Management Systems?](#)” accessed July 2022.

Data has gravity that pulls in apps and more data.

Real-time data access and visibility is increasingly critical for maintaining a competitive edge. At the same time, new applications and new use cases — such as those enabled by AI and IoT — are surpassing the limits of traditional siloed data centers and processes, such as extract, transform, load (ETL).

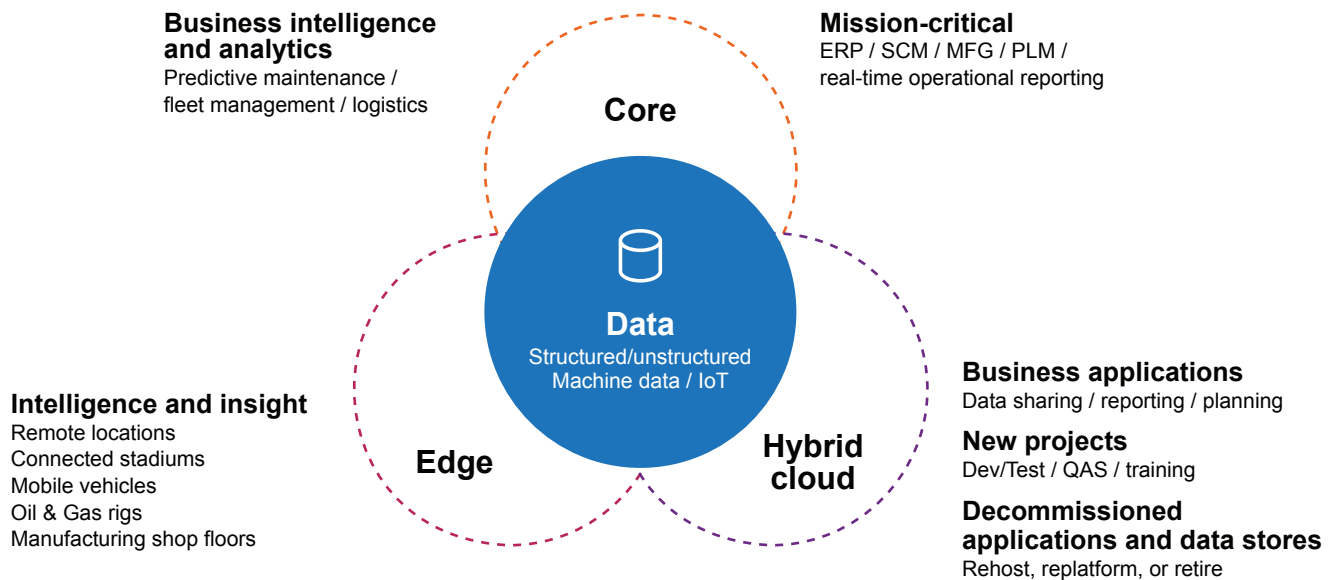
Data has become so big and distributed that where the data is created and where it is used have become critical considerations for speeding workloads and decision making. The larger the amount of data, the harder it is to move. Therefore applications, services and even other data will be attracted to that data and orbit it as though it were a center of gravity. Just as gathering clouds of stardust once condensed into stars and planets that exert a gravitational force of their own on surrounding objects, data is gaining mass and pulling applications and services toward it.

Data needs to be ingested, aggregated, analyzed and acted upon near these centers of gravity to make the maximum impact. By putting applications and services near the data, you can reduce latency and improve performance. Analytics processes run faster, so you can make better decisions more quickly. Response times are shorter, improving the customer experience.

As modern businesses adapt to a more distributed data landscape, IT needs to be prepared with a data management strategy that allows you to make use of data that lives in distributed hybrid environments. By adopting an IT strategy that respects the principles of data gravity, you can leverage your data no matter where it resides. This includes considering data virtualization, which is changing the world as we know it. There are additional strategies that can be considered when it comes to data gravity, such as colocation and as-a-Service. Dell Technologies has solutions that support data at the edge, on-premises, in a colocation and across hybrid and multiclouds.

Data gravity impacts

Applications | data placement | data management



Unlocking the value of your data

Data virtualization refers to abstracting data from different sources, locations and formats — without copying it or moving it — into a single layer that allows users to query it in real time from a single, unified interface. This also allows sensitive data to be controlled from a single location. By eliminating the need to create multiple copies of data, the cost of storing and managing it are likewise minimized.

Some of the key drivers of data virtualization are the challenges posed by traditional data warehouses used for business intelligence (BI). At the core, it's a requirement to copy and load data into the data warehouse reporting platform. Historically, ETL processing — or data pipelining — has been employed for data transformation. This process has introduced challenges that can't be ignored as you strive to become more responsive to customers, partners and market dynamics in real time. Some of the larger challenges include:

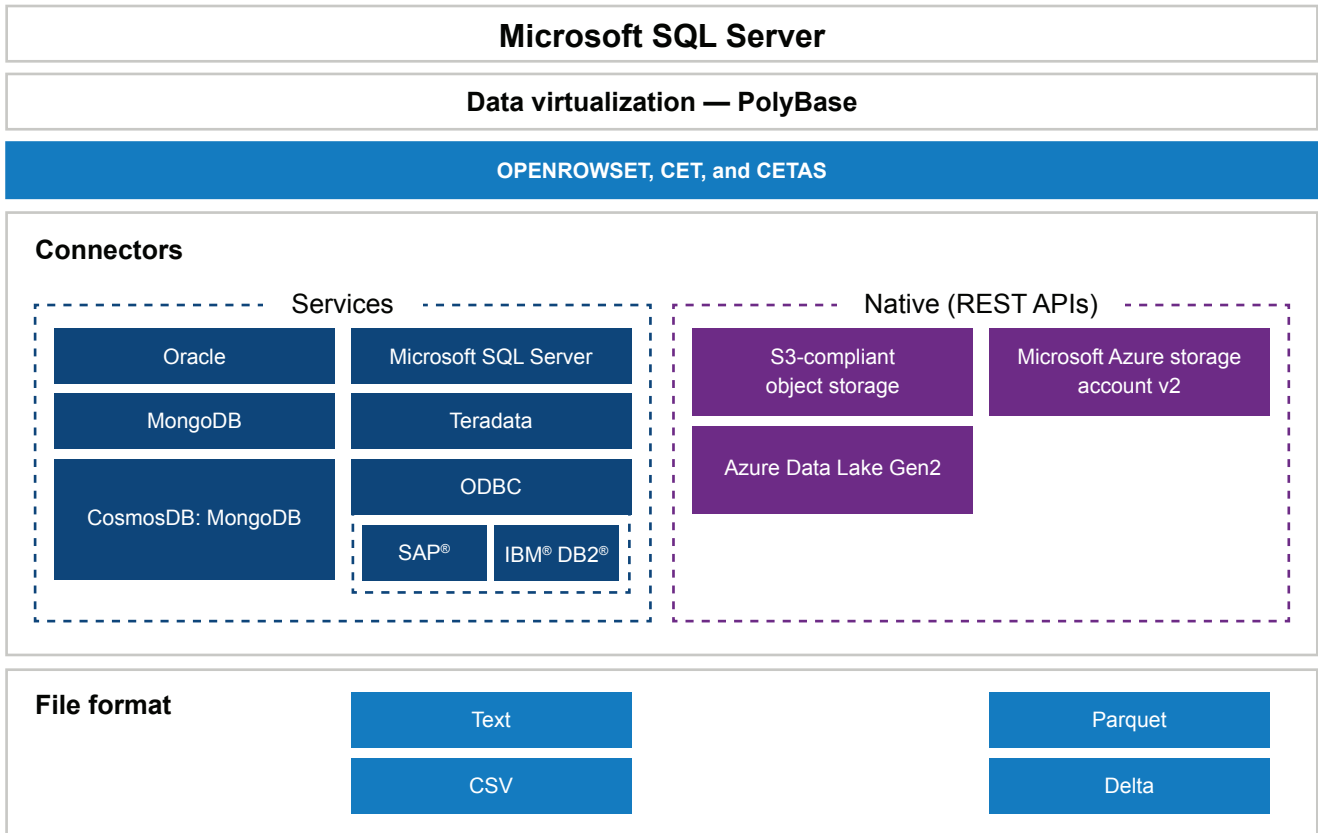
- **Data latency.** ETL pipelines introduce an inherent delay. Often, data sets delivered by ETL pipelines are between two and seven days old by the time they reach an analytics system. This causes delays in data processing that inhibit business opportunities.
- **Analytics challenges.** The expansion of IoT, connected devices and people is generating volumes of data that exceed the storage capacity of any traditional database system. This new type of data is often in formats that are not suitable for storing in relational database tables or for querying using relational query semantics.
- **Data needs context.** Many IoT data sets are unstructured, overwhelming in volume, velocity and variety, and — without business context — have no value. IT needs to build the bridge for data stored in relational databases to come together with IoT for true real-time BI and response that leads to self-learning, intelligent applications and business processes leveraging AI and ML.

With increasing adoption of data virtualization comes the need for data management platforms and infrastructure that can manage this virtual data layer with a unified view that bridges multiple applications, users, data stores and locations. The SQL Server database management system is continuing to extend its capabilities as a platform for data unification.

PolyBase: query over any data type.

Microsoft began offering PolyBase data-virtualization capabilities starting with SQL Server 2016. PolyBase is a scale-up technology that accesses and analyzes both nonrelational and relational data residing in different locations, all from within SQL Server. It enables applications and users to query a variety of data stores including those supporting open database connectivity, NoSQL, relational databases and big data stores in Hadoop® Distributed File System (HDFS)–compatible distributions and file systems. Connectivity to HDFS and object storage is made possible using publicly documented REST APIs.

SQL Server 2019 extended the capabilities of PolyBase with new connectors to create external tables that link to a variety of data stores, including SQL Server, Azure® SQL Database, Azure SQL Data Warehouse, Oracle®, Teradata®, MongoDB®, Azure Cosmos DB or any open database connectivity (ODBC)–compliant data source via a generic ODBC driver.

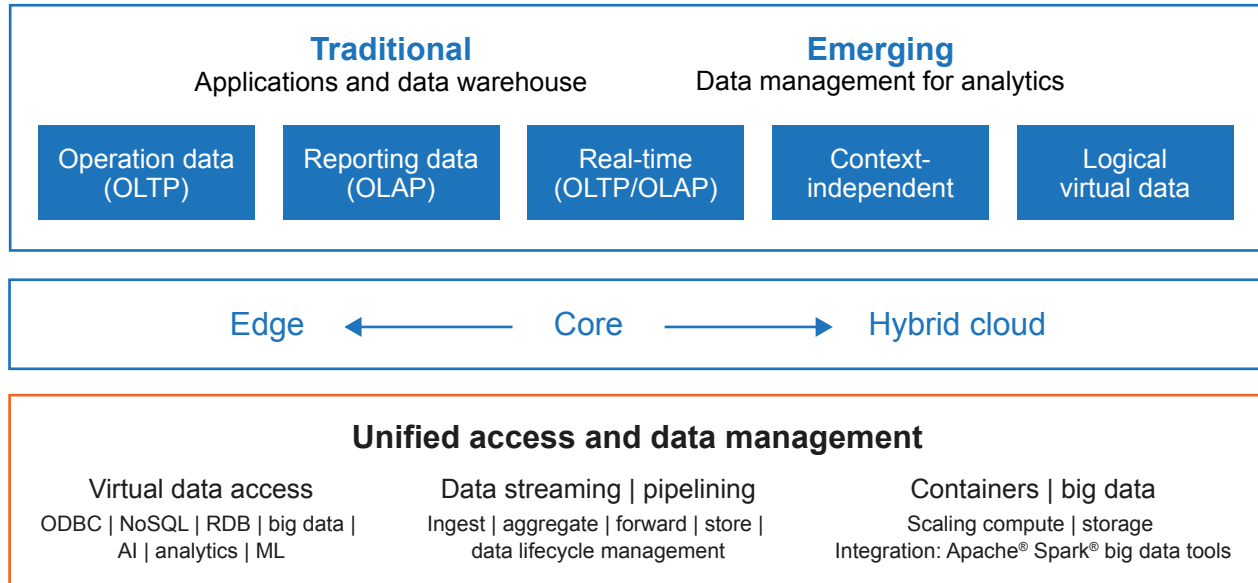


It's clear that increasing data virtualization and embracing new capabilities for a unified data management platform requires a new strategy for data services and infrastructure that complement SQL Server. With SQL Server 2022, Microsoft introduced new enhancements to SQL Server and PolyBase, including the introduction of object storage integration to the data platform. This will enable you to integrate SQL Server with Simple Storage Services (S3)-compatible object storage, like [Dell Elastic Cloud Storage \(ECS\)](#) or Azure storage.

Dell ECS boasts unmatched scalability, performance, resilience and economics. Deployable as a turnkey appliance or in a software-defined model, ECS delivers rich S3-compatibility on a globally distributed architecture, empowering you to support enterprise workloads such as cloud-native, archive, IoT, AI and analytics applications at scale, with all the data stored in one location. In SQL Server 2022, S3 storage can be able to be used for backup and restore as well allowing PolyBase to query data. For more information on the latest connectors and enhancements, please visit Microsoft Documentation "[Introducing data virtualization with PolyBase.](#)"

Relational database management systems (RDBMS)

Traditional and emerging use cases



Data virtualization has powerful implications. Making data accessible to more than just the most highly skilled data scientists means it can now be included in multiple reports, dashboards and applications — multiplying its value. When teams can easily consume data from multiple sources, regardless of location and type, you've effectively removed the boundaries that inhibit comprehensive data analysis and expedited decision making and value creation throughout your organization.

Evolving data virtualization

In the vision for Microsoft Intelligent Data Platform, databases, analytics and data governance will be designed together. The goal is to simplify the platform to make it easier for developers to make each app intelligent so that it can adapt to data in real time. To do this, analytics can't just be a backend, siloed process, it needs to be integrated with the operational databases.

Azure Synapse Analytics (Synapse) brings together data integration, enterprise data warehousing and analytics, allowing for a unified environment regardless of data location. Synapse will continue to strive to reduce ETL/ELT processes through integrations with SQL Server. Azure Synapse Link for SQL will automate the replication of data from both Azure SQL Database and SQL Server 2022 and beyond. This will allow for an end-to-end unified experience across the entire data estate.

Managing your data

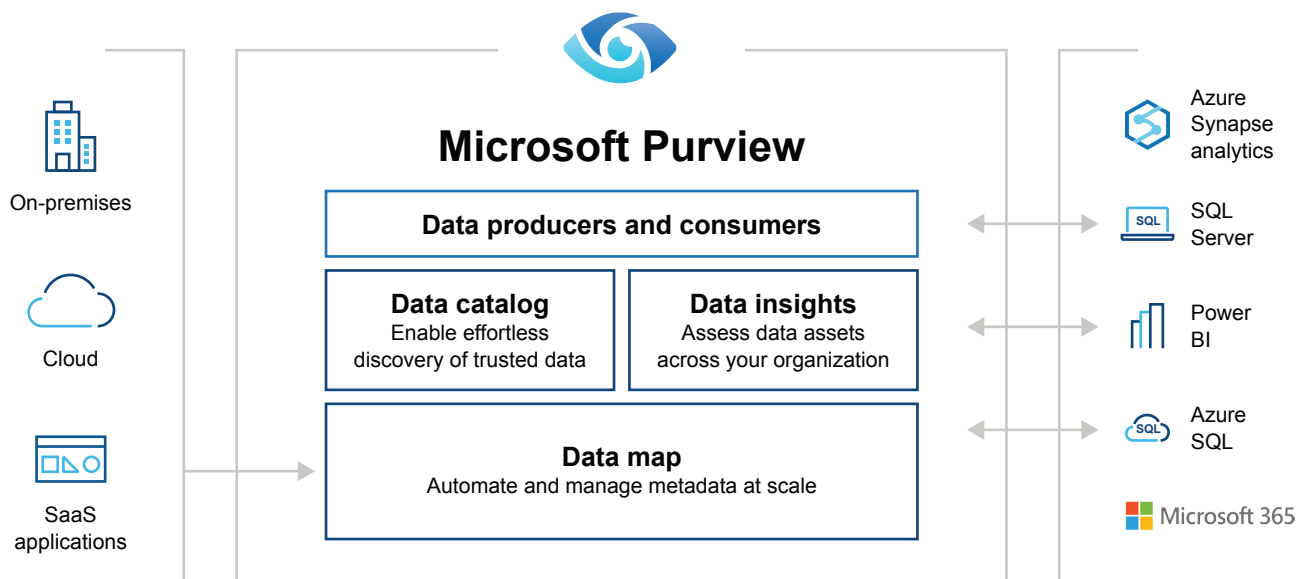
Data services and infrastructure

Today's world is hybrid and multicloud, which makes it a challenge to control complex environments that reach across off premises, on premises, colocations and edges. Microsoft addresses these complexities through Azure-based solutions designed to simplify governance and management via a consistent management platform.

“We fundamentally believe hybrid has introduced a new set of requirements for the public cloud that push the way we think about cloud technology. It's not just hosting in hyperscaled data centers — it's a platform that extends all the way to the edge to anywhere that cloud-born innovation is needed, to the factory floor or even to a farmer's field.”

—Kathleen Mitford, Corporate Vice President, Azure Marketing, Microsoft²

An example of this is Microsoft Purview™, which is the key data governance component of the Microsoft Intelligent Data Platform. Purview allows for a holistic, up-to-date map of your data landscape, automated data discovery, sensitive data classification and end-to-end data lineage.



Additionally, Microsoft Azure Arc seeks to provide a single management plane for all your Windows®- and Linux®-based physical servers, virtual machines (VMs), Kubernetes® clusters, SQL Server and Azure data services on-premises. For the remainder of this section, we will focus on SQL Server and Azure Arc-enabled SQL Server Managed Instance (SQL MI), which is enabled through Azure Arc-enabled data services. These are two very different ways of deploying SQL Server; however, both can leverage Azure Arc in different ways.

² Microsoft Azure Hybrid, Multicloud, and Edge Day digital event, June 15, 2022.

SQL Server

For most enterprises, data doesn't just have multiple silos — it also spans nearly every version of SQL Server from 2012 through the most current release. In these scenarios, Azure Arc provides a centralized, unified way to manage your entire environment, regardless of location. For existing users of Microsoft Azure, this experience will leverage familiar Azure services and management capabilities. This allows for consistent inventory, management, governance and security for all your servers across your hybrid or multicloud environment.

SQL Server can provide insights on data wherever that data sits, and Azure Arc can help manage your SQL Server wherever it is located. However, where your data is located is also crucial to its security, performance and value. This is an area where Dell Technologies excels in providing the right solutions to help meet the disparate requirements of companies of all sizes. We have solutions for traditional SQL Server deployments running on Windows Server® and solutions for companies looking to embrace cloud-native concepts and deploying SQL Server in containers, orchestrated by Kubernetes.

SQL Server Managed Instance (SQL MI)

For enterprises that have decided to utilize Kubernetes for SQL Server deployment, there are multiple options for deployment. One is to leverage Azure Arc-enabled data services and get a single, consistent experience across on-premises, multicloud and edge. One key difference between running SQL Server in containers and SQL MI is that, like Azure SQL instances, the version of SQL will always be current. Updates to your environment will take place automatically, ending the disruption of end-of-support inherent with a traditional, on-premises deployment.

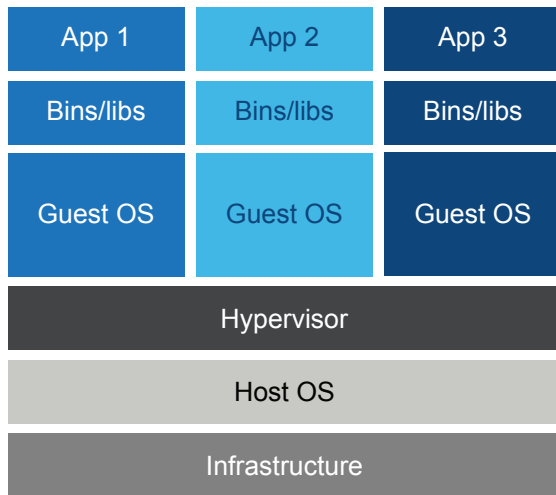
In Azure, storage and compute are provided by Microsoft with guaranteed service level agreements (SLAs) for performance, throughput and availability across each of the service tiers. With Azure Arc-enabled data services, you can use your desired Dell Technologies infrastructure to meet the needs of your application environment, often planning for well beyond the SLAs available in a public cloud.

SQL MI provides two software-based service tiers for you to choose from: general purpose (GP) and business critical (BC). The GP tier shares the same feature set as SQL Server Standard Edition, while BC shares the same as SQL Server Enterprise Edition. In addition, BC includes a high availability and read scale-out feature using Contained Availability groups managed by Kubernetes. This allows your SQL Server-based application to use secondary replicas for additional read scale and higher availability.

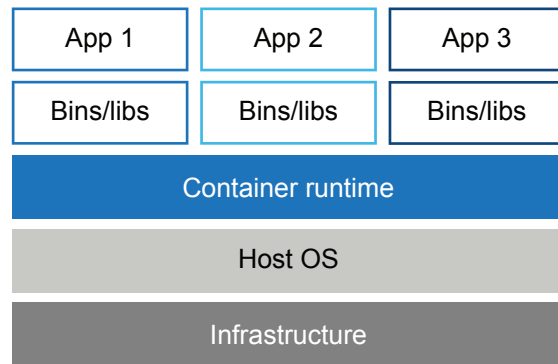
Container Storage Interface (CSI)

Containers have reshaped the way companies think about developing, deploying and maintaining applications and software. Relational databases, including SQL Server, have embraced containerization together with the Kubernetes orchestration framework. The containerized approach allows for consistent deployment options regardless of the instance's location and is a foundational requirement for some of the newest SQL Server features.

Containers and the benefit they specifically provide SQL Server will continue to grow. Containerized database workloads will greatly simplify database development and data scientist research cycles, along with production deployments, upgrades and high-availability orchestration. Kubernetes and other container orchestrators are extending their reach to long-running processes, especially in the analytics space.



Virtual machines



Containers

The dilemma, when it comes to building or updating databases like SQL Server using containers, is that the data needs to be persistent and must survive through the restart, rescheduling or deletion of a container. When containers are rescheduled, the storage should also be shifted and made available on a new host for the container to start without incident.

To effectively address the challenges of stateless containers and the need for persistent storage and replication software, Dell Technologies supports a Kubernetes CSI plug-in. This integration makes it possible for developers, database administrators (DBAs) and storage administrators to utilize interfaces they are most comfortable with — such as command line interface (CLI) and the Kubernetes dashboard — to provision and manage persistent storage tiering aligned with Dell Technologies storage data services.

Dell Technologies provides CSI drivers for our storage solutions, including [Dell PowerStore](#), [Dell PowerMax](#) and [Dell PowerFlex](#) to name a few, via github.com/dell, and has worked with Microsoft to ensure validation of our storage platforms with Azure Arc-enabled data services. Dell storage platforms have long been used for modernizing and consolidating existing databases, and now we have positioned those trusted platforms for the future with the CSI drivers.

Simplifying your deployment

If you're looking for the ease and agility of the cloud experience within your data center or colocation, [Dell APEX](#) allows for our platforms to be consumed as-a-Service, unlocking the flexibility you need to adapt and thrive. Elastic scalability is one of the common threads between Azure Arc-enabled data services and APEX Data Storage Services. Instances of SQL Server can be ramped up or down to meet the requirements of your workloads.

The underlying storage is a key factor in the levels of scale that can be achieved, and APEX Data Storage Services allows seamless scaling of capacity up and down, as well as simple pricing with a single rate for base and on-demand capacity. There is no penalty for the flexibility of on-demand, elastic usage, so it's easy to plan and optimize your service for performance, capacity and cost. The challenges of Microsoft SQL Server in a hybrid cloud scenario are significantly reduced with the combination of Azure Arc-enabled data services and APEX.

Securing your data

IT teams can improve data security across their Microsoft data estate by taking a whole-stack approach: from hardware to database application to operating system. Modernizing infrastructure and consolidating data on the latest version of Microsoft SQL Server on Dell Technologies hardware and software solutions gives you a strong foundation to protect data end-to-end in a changing security landscape. As one of Microsoft's largest partners, Dell Technologies has worked closely with Microsoft for nearly four decades to develop industry-leading, security-enabled hardware and software solutions.

Database security

For 10 consecutive years, SQL Server has been rated as the least vulnerable database engine.³ Each new version of SQL Server includes new security features that enhance data protection. SQL Server 2019 added features such as Always Encrypted with secure enclaves, certificate management and accelerated database recovery, to name just a few. SQL Server 2022 adds a new ledger feature that helps protect data integrity by creating an immutable track record of data modifications over time. This can help protect data from tampering by malicious actors, and it's beneficial for scenarios such as internal and external audits.

Data backup, protection and cyber-recovery

As organizations in every industry turn to Microsoft SQL Server to support essential business functions, backup software has become business critical. Protecting information across the Microsoft data estate is essential for business operations and continuity. But as the volume of data continues to grow exponentially, managing backup and recovery and meeting strict protection service-level objectives (SLOs) has become increasingly challenging.

As mentioned previously, SQL Server 2022 introduced backup and restore with S3-compatible object storage. This can be used in conjunction with the Dell ECS object storage solution which delivers rich S3 compatibility and has been recognized as a leader in unstructured data storage in the Gartner Magic Quadrant for six consecutive years, most recently in 2021.⁴ And this is only scratching the surface for the solutions Dell Technologies provides when it comes to securing your data from cyberthreats.

Dell Technologies provides high-performing backup software with self-service capabilities that also helps to reduce costs, simplify compliance, meet SLOs and protect SQL Server data. Dell Technologies has a wide portfolio of hardware and software offerings that scale easily to meet data protection requirements both today and tomorrow. These solutions protect data on-premises and across hybrid and multicloud environments.

For example, [Dell PowerProtect Cyber Recovery for Microsoft Azure](#) offers multiple layers of protection to provide resilience against cyberattacks and insider threats. It moves critical data away from the attack surface, physically and logically isolating it from access within Azure with a secure, automated operational air gap. Unlike standard cloud-based backup solutions, access to management interfaces is locked down by networking controls and can require separate security credentials and multifactor authentication for access. This gives you the ability to protect, identify and restore known good data and maintain normal operations and compliance after a cyberattack.

Security at the BIOS, firmware and component levels

[Dell PowerEdge servers](#) help you defend against the risks inherent in today's environment with a security-enabled infrastructure that supports a full range of modern workloads and objectives. PowerEdge servers enable security functions like end-to-end boot verification, including Unified Extensible Firmware Interface (UEFI) Secure Boot customization, trusted BIOS, firmware chain of trust and verified OS bootloader. Firmware is protected according to National Institute of Standards and Technology (NIST) guidelines, including signed firmware updates, and certificate management is simplified through automatic renewal.

PowerEdge servers also provide data-at-rest protection using Secure Enterprise Key Manager (SEKM) and data-in-use protection with confidential-compute CPU technologies. To mitigate threats like counterfeit components, malware and firmware tampering, Dell Technologies takes a comprehensive approach to supply-chain security with tools for counterfeit avoidance, manufacture chain of custody, code signing, chassis intrusion and tamper-evident packaging. Further, Secured Component Verification (SCV) extends supply-chain security by verifying server component integrity.

³ Microsoft, [SQL Server 2022 Preview](#), accessed July 2022.

⁴ Gartner, [Magic Quadrant for Distributed File Systems and Object Storage](#), October 2021.

Dell Technologies solutions for the Microsoft Intelligent Data Platform

From the core to the edge to the cloud, Dell Technologies and Microsoft solutions are the proven choice for data-first modernization. Together with Microsoft, Dell Technologies provides the most secure, innovative and scalable solutions, that are used together at scale across the globe more than any other platform.

Dell Technologies solutions simplify the deployment, integration and management of Microsoft Intelligent Data Platform environments and accelerate time-to-value for better service delivery and business innovation. With the industry's broadest infrastructure portfolio and a long-standing partnership with Microsoft, we provide the innovative solutions that reduce complexity and enable you to solve today's challenges, no matter where you are in your transformation journey.

In today's data-driven era, businesses that can quickly and efficiently access and analyze data, regardless of where it is created, will have a competitive edge. Dell Technologies solutions for Microsoft data platform help you modernize your infrastructure so you can accelerate your journey to powerful data insights.

Dell Technologies solutions for Microsoft data platform The advantage



What to take away

We are in the midst of a data management paradigm shift. All the IT “truths” we have come to know over the last several decades are changing — and in a good way. Foundationally, the way we collectively look at data and what we do with that data are shifting to a more nimble and accessible future state. This new data era requires an innovative approach to data management — one that replaces monolithic, siloed databases with new models for using and sharing data across the organization. Ensuring your planning is actively addressing this journey will allow you to make decisions that continue to enable that progress. These decisions will become additive and interactive versus standalone siloed builds that become islands of neglected technology.

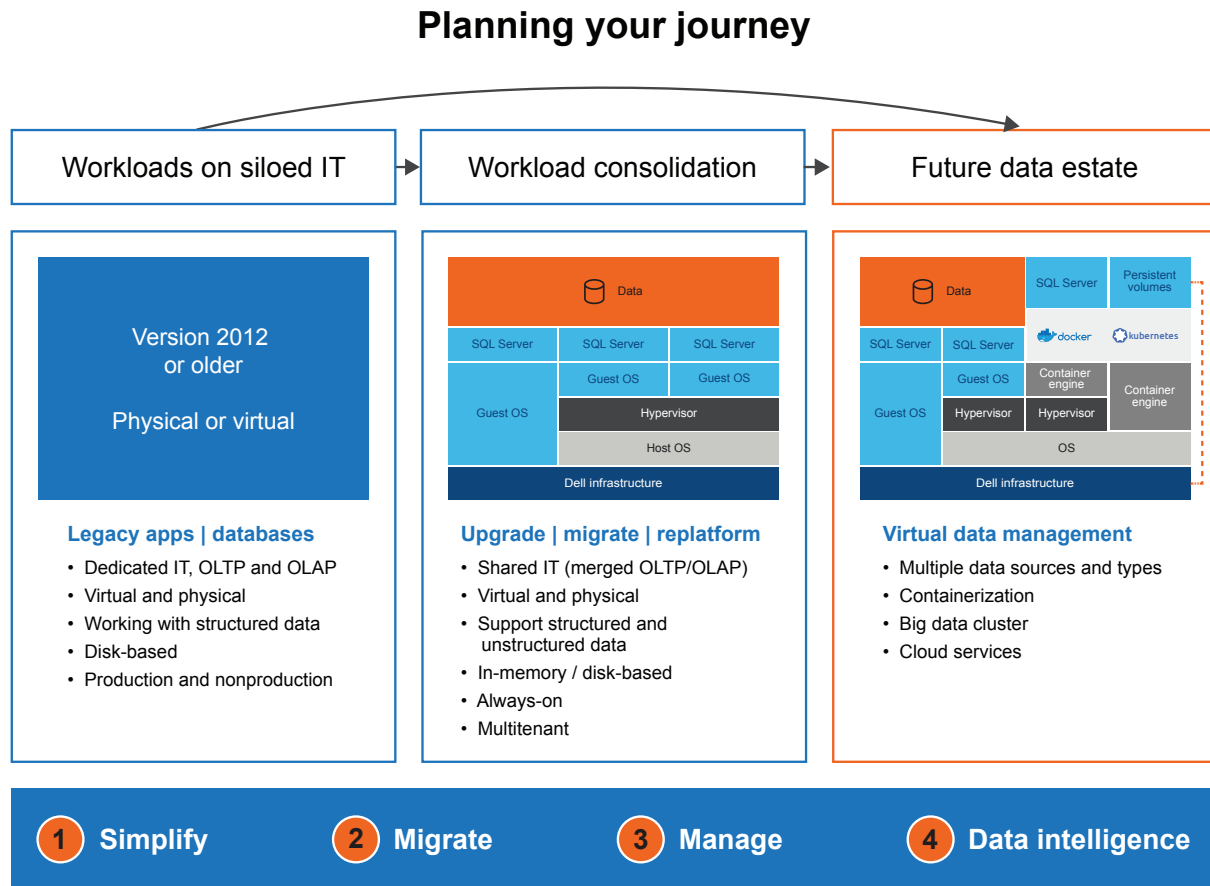
The new truth is:

- Data has gravity, and applications and analytics orbit around that data, wherever it resides.
- Virtualizing data creates a totally new paradigm where data is democratized and available to all, without the need for time-consuming, complex ETL and ever-increasing amounts of storage.
- The forklift mentality is at an end. It's no longer an “or” story, but an “and” story. You have the freedom to do what makes sense for your business.

Relational databases, such as SQL Server, have emerged with architectures and tools designed to bring business and operational data together with AI, ML and DL. This evolution into unified data management platforms enables you to harness more data from more sources, providing actionable insights more quickly and cost-effectively than the competition.

Where will you start?

Data-first modernization enabled by digital transformation is a journey. While everyone's path to the future data estate is unique, as illustrated below, most share some common objectives. These include sustaining older versions of SQL Server deployments (including the applications) while migrating to the latest version SQL Server and ultimately enabling virtual data access and management leveraging containers, better DevOps and hybrid cloud services.



Let's look at some of these objectives:

- The typical business today is running hundreds of applications and supporting multiple databases and mixed workloads. Consolidation strategies must take into consideration the availability and performance requirements of business-critical applications while maintaining low latency with fewer resources. Faster, more powerful CPUs and new storage technologies make it possible to consolidate databases without the traditional associated risks. Consolidating and simplifying mixed workloads running on SQL Server siloed IT environments will not only lower costs and increase productivity but also establish a modern infrastructure foundation that's ready for the future data estate.
- Your teams need more choices of development languages, data types and operating systems to unlock the value of your data. Replatforming SQL Server to Linux (or a mixed Windows/Linux platform) will open doors to greater flexibility as it pertains to data integration, containerization and analysis. There are also potential cost benefits including licensing, training time and hardware costs.
- Containerization provides a flexible platform for even the most complex applications and databases. Containerization of SQL Server empowers you to deploy updates and upgrades on the fly, and with portability to build locally, deploy to the cloud and run anywhere.

- Developing a roadmap and deployment strategy for upgrading SQL Server is paramount. Depending on your as-is state and desired to-be state, planning includes profiling and assessments for applications and SQL Server datastores to prioritize projects — upgrades, application-centric agile migrations, and potential replatforming — to execute in phases over the journey.
- Data placement is integral to any data management strategy. Data placement practices that respect the rules of data gravity can still provide the performance, availability and security business critical workloads require. Dell Technologies offers as-a-Service Dell APEX and [colocation sovereign IT adjacency solutions](#) that let you bring data closer to applications and analytics hosted by hyperscalers, such as Azure, while providing the security and control of an on-premises cloud.

With a modern data management platform in place and complementary data and infrastructure services, IT will be ready to support the business with services for new data-driven intelligent applications, business processes and analytics powered from the edge to the core.

Dell Technologies is ready to support you on the journey.

Microsoft and Dell Technologies partner to provide tested, validated and fully integrated solutions that are engineered to deliver optimized performance for SQL Server. Dell offers industry leading infrastructure choices as well as the skillsets and experience to make SQL Server deployments successful. Microsoft grants competencies to partners who demonstrate proficiency by having both skilled employees as well as satisfied customers; Dell Technologies has more than 16,000 certified employees across customer support, maintenance, deployment, training and consulting and has been granted 18 global competencies and five advanced specializations.

Dell Technologies has the expertise to help you make the transition to virtualized data that resides in the optimum location without the forklift upgrade. SQL Server manages your data across platforms, on-premises and cloud. Our services experts are here to meet you where you are, on any platform, with the tools and languages of your choice. We will work with you to:

- Plan, design and implement SQL Server on- and off-premises.
- Modernize and optimize database services.
- Accelerate innovation with data-driven insights.
- Build and manage a production grade Kubernetes platform with AKS.
- Utilize Microsoft Azure Arc to extend Azure data services and management to Dell Technologies' on-premises cloud deployments.

Learn more

If you're ready to consider a certified, award-winning Microsoft partner who understands your SQL Server endeavors for modernization, the holistic Dell Technologies approach can help you minimize risk and business disruption.

To find out more, visit Dell.com/Microsoft-Data-Platform and contact your Dell Technologies representative.

Additional reading

Dell Technologies

Visit [Dell Technologies InfoHub](#) for technical documentation, including:

- Modernize Your Microsoft SQL Server Platform and Accelerate Deployments — Validated Design ([design guide](#))
- Microsoft SQL Server 2019 on Windows Hyper-V® using PowerFlex ([white paper](#))
- Dell ECS and Microsoft SQL 2022 S3 Object Storage Integration ([white paper](#))
- Containerized Microsoft SQL Server on Dell Technologies APEX ([white paper](#))
- Dell PowerStore with Azure Arc–Enabled Data Services ([white paper](#))
- Building Azure Arc–Enabled Data Services for a SQL Managed Instance on Dell PowerFlex ([white paper](#))
- Building a Hybrid Database-as-a-Service Platform with Azure Stack HCI ([white paper](#))

Microsoft

- [Microsoft SQL Server 2019](#)
- [Microsoft SQL Server 2022](#)
- [Microsoft Azure Arc](#)
- [Microsoft Azure Synapse](#)
- [Microsoft Purview](#)

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