

Power AI and Analytics Workloads with Performance, Security and Enhanced Capabilities

Next-generation Dell PowerEdge servers and Microsoft SQL Server 2022 offer new capabilities to meet the needs of businesses running demanding database workloads.



To stay competitive, businesses are increasingly turning to AI and advanced analytics to help make faster, data-driven decisions. In a survey by NewVantage Partners, 91.7 percent of companies said they were increasing investments in data and AI.¹ Despite this investment, only 26.5 percent report that they achieved their goal of becoming a data-driven organization.¹ This drive toward data-driven nirvana puts tremendous pressure on IT decision makers (ITDMs) to invest in the right infrastructure to support the growing AI and analytics needs of their businesses.

The right infrastructure must consist of both hardware and software that provides high levels of performance to support large and growing datasets. But performance isn't the only factor. Businesses rely on strong security that can stand up to modern threats. And they need to ensure high levels of availability to avoid costly downtime.

Modern organizations also need systems that can flexibly support both on-premises and hybrid cloud environments, so they can make use of cloud-based services like Microsoft Azure Arc and the business-continuity benefits provided by a hybrid cloud.

With so much on the line, many businesses are turning to two industry leaders for answers to these challenges: Dell Technologies and Microsoft. Microsoft SQL Server 2022 on next-generation Dell PowerEdge servers can provide the performance, security and advanced capabilities businesses need, while delivering an appealing total cost of ownership (TCO).

Performance

To stay ahead of the competition, businesses need to support increasingly demanding database-driven workloads, built to support new AI and advanced analytics initiatives that can improve the accuracy of forecasts and enable real-time decisions. The success of these new initiatives relies on optimal performance from both SQL Server and the supporting hardware platform.

SQL Server 2022 on Windows Server 2022 brings new levels of memory support. Windows Server 2022 can support up to 48 TB of RAM. SQL Server 2022 Standard edition can support up to 24 cores and 4 sockets, while SQL Server 2022 Enterprise edition supports unlimited cores.

When organizations purchase a next-generation Dell PowerEdge server with SQL Server 2022, they can make use of the added cores and sockets to achieve new levels of query performance, along with support for larger database sizes. SQL Server 2022 also accelerates query performance and tuning with no code changes required. For example, SQL Server Query Store provides insights for tuning query plan performance, and is enabled by default. Furthermore, new intelligent query processing (IQP) features can improve the performance of existing workloads with minimal effort to apply.

Database workload performance also gets a boost from the latest generation Intel Xeon processors or AMD EPYC processors powering next-generation Dell servers. The latest Dell platforms also feature PCIe Gen 5 support for faster data access, DDR5 memory, a Dell Boot Optimized Server Storage (BOSS) N-1 controller with NVMe Express (NVMe) support for faster boot times, and Dell PowerEdge RAID Controller 12 (PERC 12) with support for NVMe drives, offering performance 2x better than Dell PERC 11 and 4x better than Dell PERC 10.²

In addition to faster RAID rebuilds and backups, these combined performance enhancements enable faster ingestion and processing of data, even with very large databases, empowering businesses to achieve results faster and maintain a competitive edge.

Security

In today's complex cybersecurity landscape, businesses face numerous security threats, extending from the hardware and firmware to the operating system (OS) to the database software and the data itself. To address this challenge, Dell Technologies and Microsoft are working together to provide multilayered security.

At the hardware level, security begins even before servers make it to the data center. Dell Technologies employs Secured Component Verification (SCV) to better ensure server component integrity as part of a more secure supply chain. Once deployed, hardware, firmware and software protections take over. For example, PowerEdge servers are built on a silicon-based root of trust and provide end-to-end boot verification, including Unified Extensible Firmware Interface (UEFI) Secure Boot customization, trusted BIOS, a firmware chain of trust and a verified OS bootloader. Firmware conforms to National Institute of Standards and Technology (NIST) guidelines.

When SQL Server 2022 is deployed on a Secured-core server running Windows Server 2022, Microsoft and Dell Technologies help ensure advanced protection and simplified security through a collection of built-in hardware, firmware, driver and OS security features that:

- Create a hardware-backed root of trust
- Defend against firmware-level attacks
- Protect the OS from the execution of unverified code

Other features help block entire classes of vulnerabilities at the driver and memory level. Hypervisor-Protected Code Integrity (HVCI) runs enhanced code-integrity checks that authenticate kernel-mode drivers and programs to make sure they come from trusted sources. That helps ensure that only trusted code is loaded into memory.

SQL Server 2022 also provides a SQL Server ledger to help ensure data integrity. This capability provides an immutable ledger to protect SQL data from tampering by malicious actors. Using blockchain technology, the SQL Server ledger establishes digital trust and uses attestation to ensure data has not been compromised.

This multilayered security approach, from hardware to firmware to the OS and database software, helps ensure comprehensive protection for the entire stack.

Management Capabilities

The collaboration between Dell Technologies and Microsoft brings new hybrid cloud and on-premises capabilities that simplify the management of both hardware and SQL Server.

For example, SQL Server 2022 introduces Azure Arc-enabled capabilities, offering stronger business continuity with disaster recovery in the cloud through continuous replication and support for online failover.

Azure Synapse Link for SQL enables seamless, near-real-time analytics over on-premises operational data. As a result, organizations can run analytics, business intelligence and machine learning scenarios on operational data with minimal impact on source databases.

For enhanced visibility of all data, regardless of its location, Microsoft Purview automatically scans on-premises SQL Server databases to capture metadata. It can then classify data using both built-in and custom classifiers. Microsoft Purview also lets organizations set up and control specific access rights to their SQL Server databases through role-based security.



Figure 1. SQL Server 2022 offers expanded capabilities with performance, security, availability and enhanced visibility

On the Dell server itself, the Integrated Dell Remote Access Controller 9 (iDRAC9) makes system deployment, diagnostics and lifecycle management easier with secure, comprehensive management and scripting automation across the PowerEdge family of servers.

Together, this rich set of features empowers organizations with efficient management, disaster recovery capabilities and full visibility of their systems, databases and data.

Accelerate, Secure and Simplify Database Workloads

Next-generation PowerEdge servers with SQL Server 2022 bring exceptional performance and security with enhanced capabilities to critical workloads. The solution enables organizations to gain faster insights from more data to power modern initiatives, like AI and analytics, that put the business one step ahead of the competition. And when SQL Server 2022 is purchased along with a Dell server, organizations can benefit from significant price savings along with ease of deployment, because the SQL Server software is included, ready to install.

Learn more about SQL Server 2022 with next-generation Dell servers:

Design Guide—[SQL Server 2022 Database Solution with Object Storage on Dell Hardware Stack](#)

Reference Architecture Guide—[Implementing SQL Server 2022 on Dell Integrated System for Azure Stack HCI](#)

White Paper—[Enhance End-to-End Data Security with Microsoft SQL Server, Dell™ PowerEdge™ Servers and Windows Server 2022](#)



Windows Server 2022. Modernize to boost your business.

¹ NewVantage Partners. "Data and AI Leadership Executive Survey 2022." January 2022. www.newvantage.com/files/ugd/e5361a_ad5a8b3da8254a71807d2dccb0844be.pdf.

² Storage Review. "Dell PowerEdge 16G Intel Servers Announced." January 2023. www.storagereview.com/news/dell-poweredge-16g-intel-servers-announced.

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