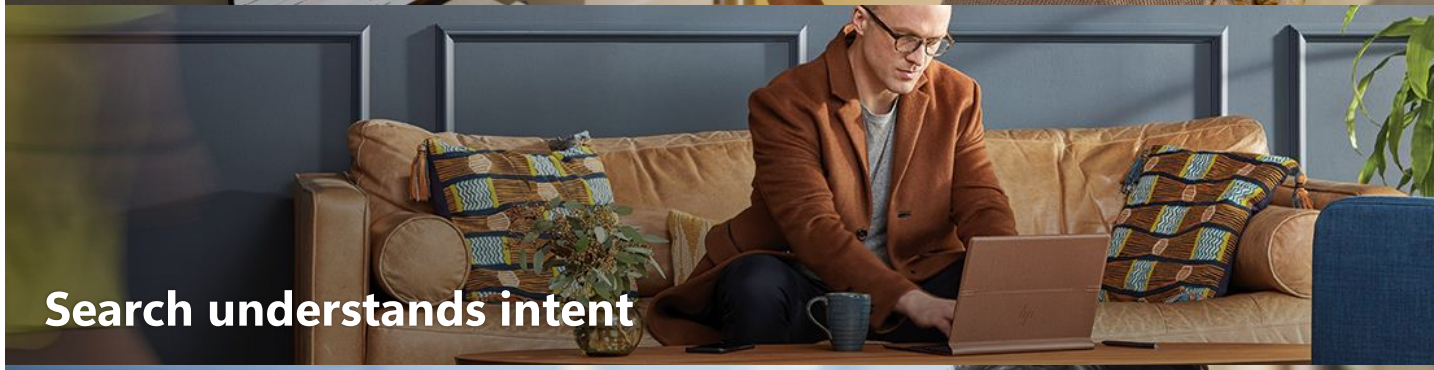
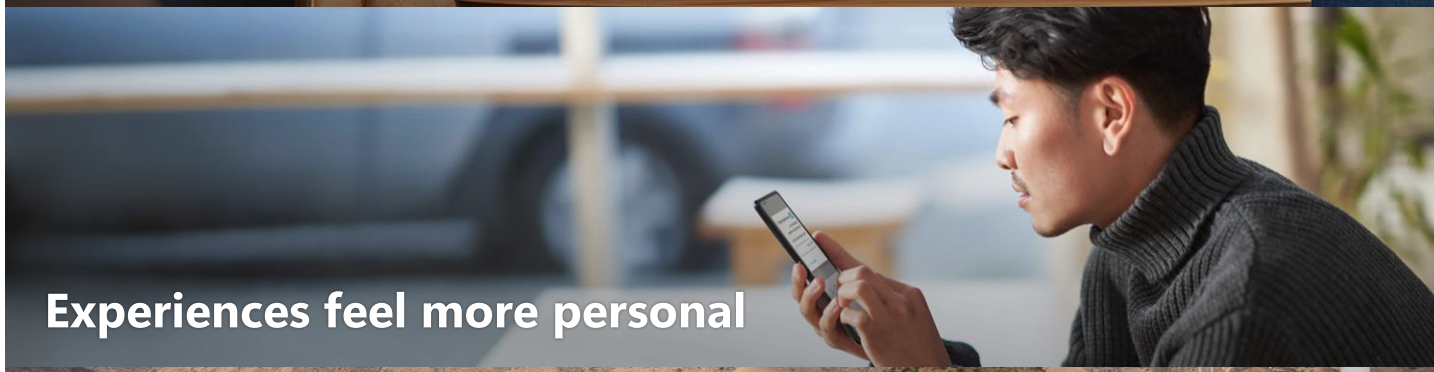
Microsoft

Introducing SQL Server 2025

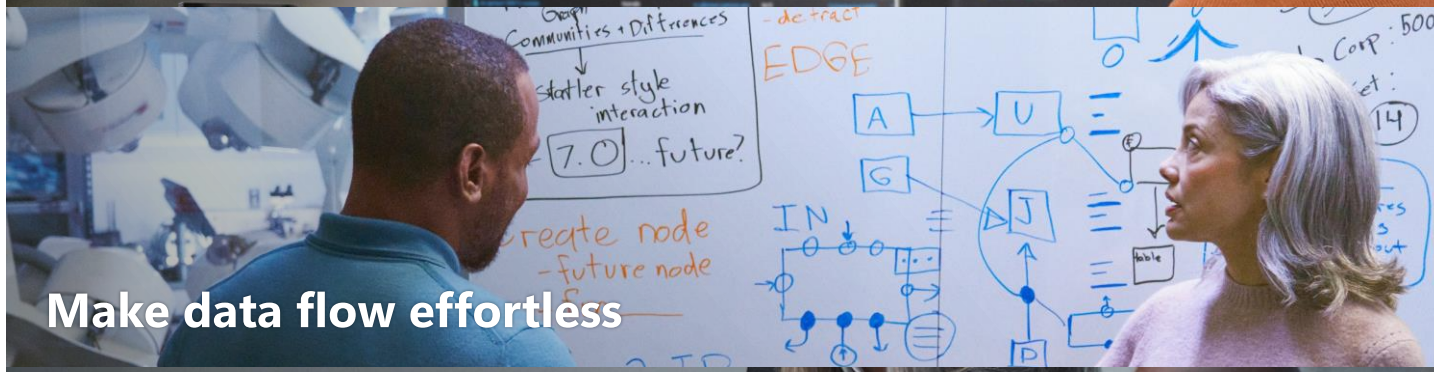
Customer Deck

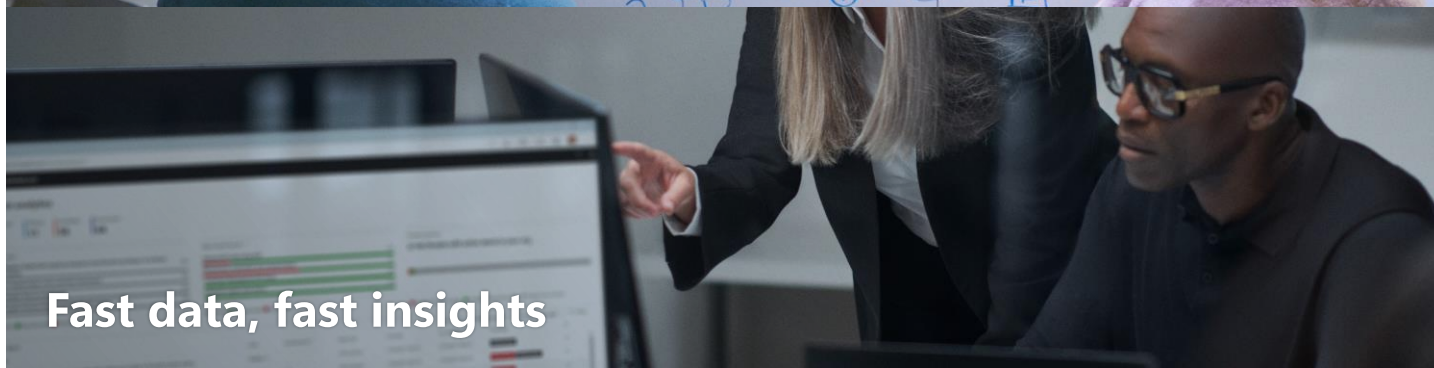
AI is transforming the world





Data is the fuel that powers AI





Today's data realities

How can my data infrastructure power AI innovation while keeping security and privacy first?

Is my data always available?

Can people access the data needed to make the right decisions?

How can I improve performance with no code changes?

How can I enable faster business insights?

Is it trustworthy?

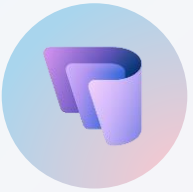
Microsoft SQL – ground to cloud to Fabric

The AI-ready enterprise database from ground to cloud

Develop once deploy anywhere

SQL Server 2025

Azure SQL

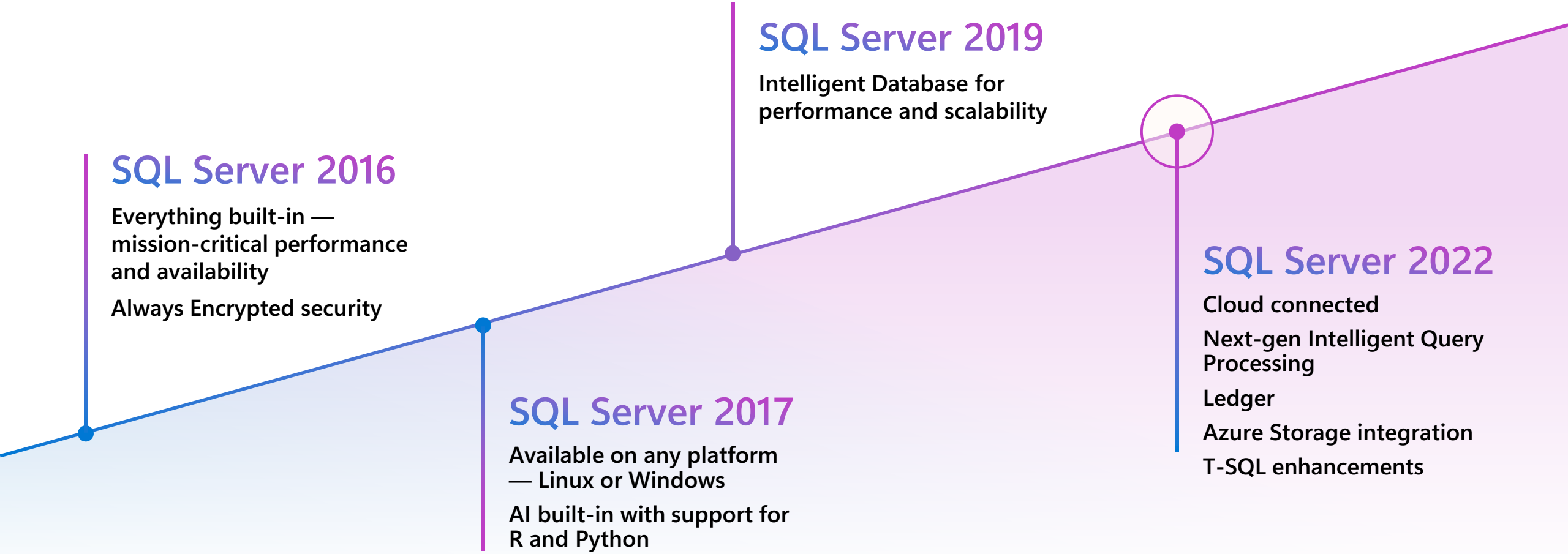


SQL database in Fabric

Consistent engine, tools and features

SQL Server investments over the years

Continual innovations built into SQL Server,
giving you higher return on your investments



SQL Server 2016

Everything built-in — mission-critical performance and availability

Always Encrypted security

SQL Server 2017

Available on any platform — Linux or Windows

AI built-in with support for R and Python

SQL Server 2019

Intelligent Database for performance and scalability

SQL Server 2022

Cloud connected

Next-gen Intelligent Query Processing

Ledger

Azure Storage integration

T-SQL enhancements

Generally Available

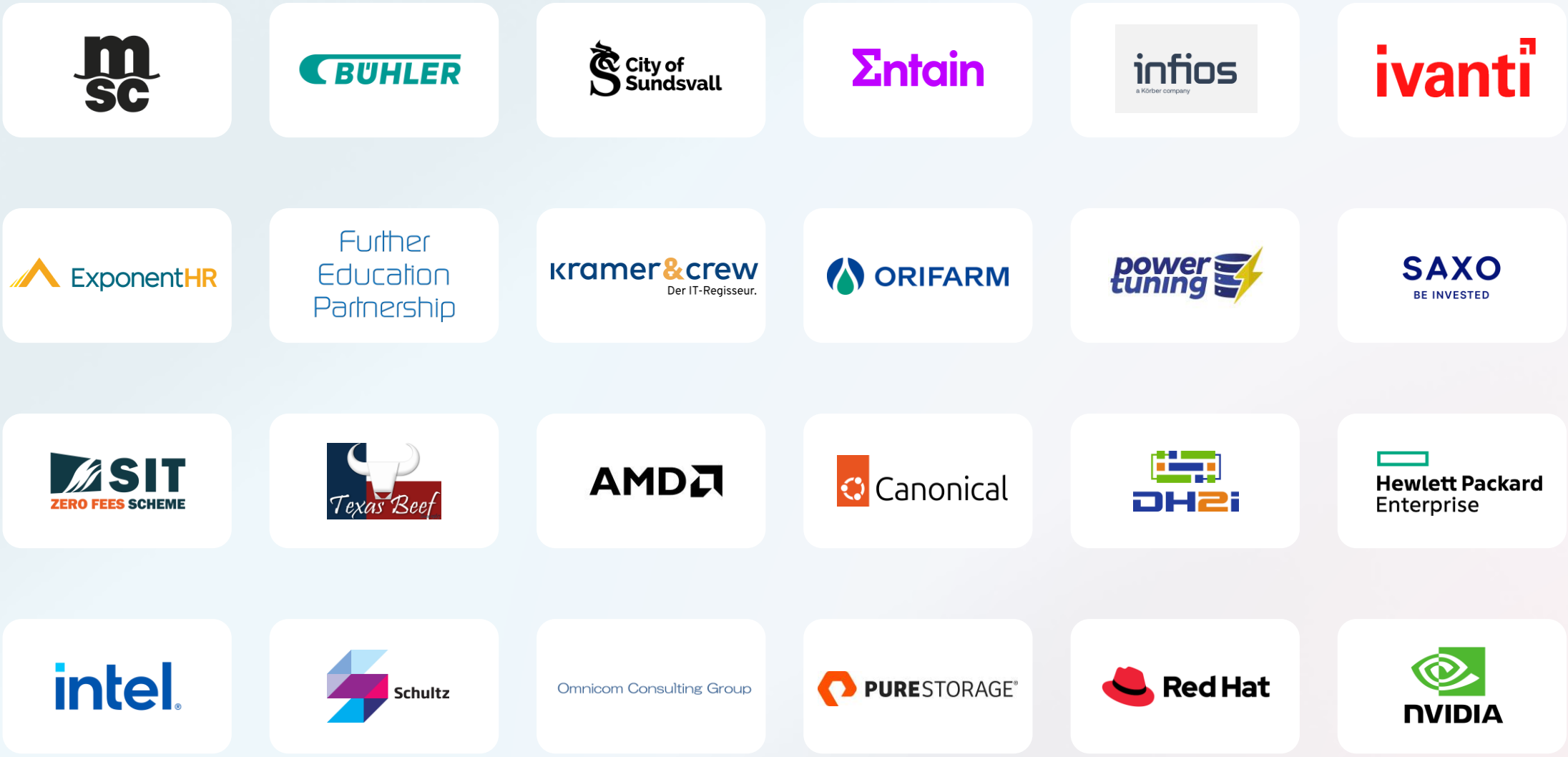
SQL Server 2025

The AI-ready enterprise database from ground to cloud

Best-in-class security and performance | AI built-In | Made for developers | Cloud agility through Azure

aka.ms/sqlserver2025blog

Top customers and partners



Case study – Infios

All the new features in SQL Server 2025 are really going to help us reduce the number of outages we have, improve performance, and make it easier for our teams to manage our databases.

– Glenn Berry, Services Database Engineer, Infios

Situation

- Frequent deadlocks slowing critical transactions, impacting 2,200+ databases across hybrid environments
- Developer productivity hindered by manual fixes. Code changes pull developers away from product work.
- Lack of consistent management across hybrid environments

Read full story here

Solution

- Optimized locking and deadlock detection in SQL Server 2025 reduces transaction contention, improving reliability for high-volume workloads.
- Backup compression for CPU efficiency minimizes resource consumption during backup operations, reducing CPU usage while maintaining high data integrity.
- Unified Management via Azure Arc Integration ensures consistent governance and security across hybrid environments, simplifying operations and compliance.

Impact

- Eliminated deadlocks during peak load testing with SQL Server 2025
- Reduce CPU usage by 50% during compressed database backups
- Enabled unified management of 2,200+ SQL Server instances through Azure Arc, streamlining governance and operational oversight

Case study – Mediterranean Shipping Company

> **With traditional ETL processes, we were getting our data every six hours. Mirroring SQL Server in Fabric helps us to get data in real time into our analytical solution. That is a game changer.**
>
> – Javier Villegas, IT Director for DBA and BI Services, MSC

Situation

- Transitioning from batch ETL (every 6 hours) to real-time analytics.
- Modernizing hundreds of applications is slowed by manual integration and limited automation, impacting developer productivity.
- Scaling new backup and replica features across 1,000+ SQL Server instances.

Read full story here

Solution

- SQL Server 2025 enables real-time analytics by integrating with Microsoft Fabric, allowing MSC to make faster, data-driven decisions across global operations.
- Advanced backup compression and secondary replica features in SQL Server 2025 help efficiently manage over 1,000 instances, reducing operational complexity and costs.
- Native support for JSON and change event streaming empowers developers to modernize hundreds of applications, streamlining workflows and boosting productivity.

Impact

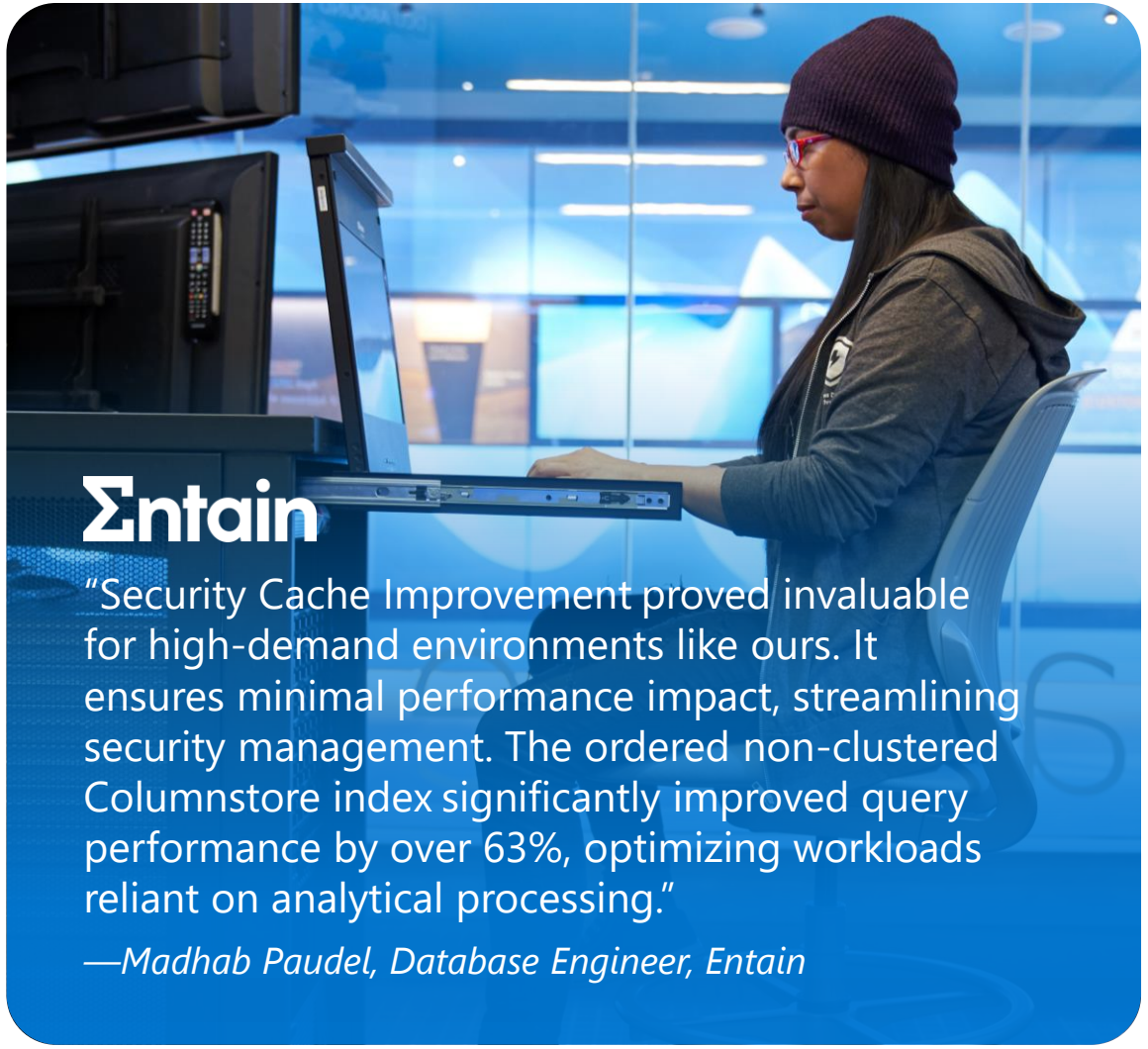
- Cut data processing time from hours to seconds, enabling real-time analytics.
- Accelerated development of new apps by leveraging built-in AI, native JSON support.
- Reduced backup storage costs by 20% out of the box.

Best-in-class security and performance

Security is increasingly critical in the AI era

SQL Server 2025 is the most secure database over the last decade*

Over 50 enhancements made to the database engine**



* According to the National Institute of Standards and Technology Comprehensive Vulnerability Database, as of November 2024

** What's new in SQL Server 2025

Secure by default

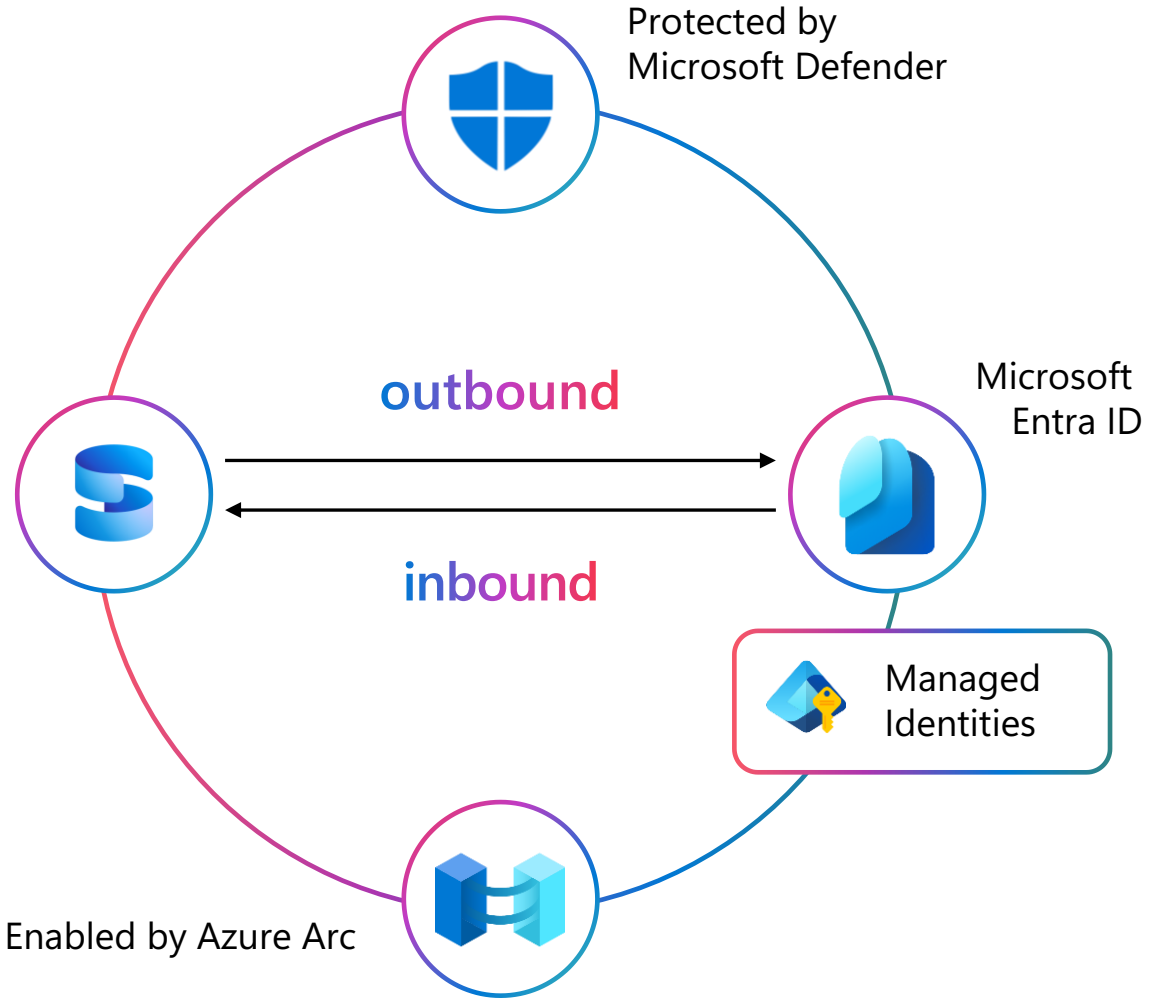
Provide the latest security capabilities for your data

Challenge

- **Complex and vulnerable** credential management
- **Difficulty** in maintaining consistent access control

Solution

- Enable passwordless inbound and outbound authentication via **Microsoft Entra managed identities**
- Use **Microsoft Defender** to continuously detect vulnerabilities and threats



Mission-critical engine

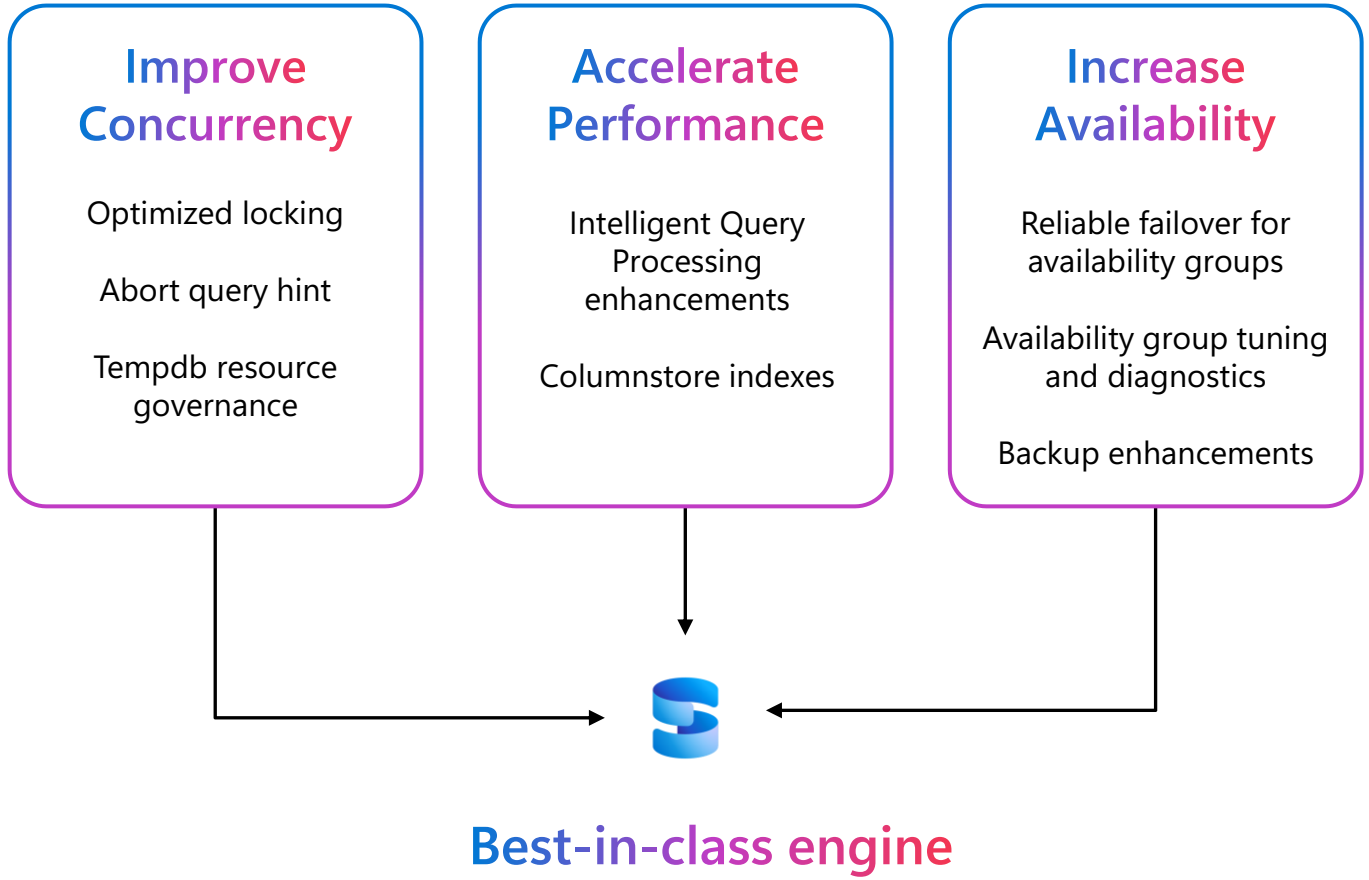
Performance and availability for modern databases

Challenge

- Excessive locking **degrades** application **responsiveness**
- Poorly optimized queries increase the **risk of timeouts**

Solution

- Increase **application concurrency and uptime** through optimized locking
- Leverage query insights to continuously **improve performance** and **application responsiveness**
- Ensure **high availability** with fast, automated failover on health issues



SQL Server 2025 delivers greater performance and value with AMD EPYC

New world record performance

TPC-H 10TB

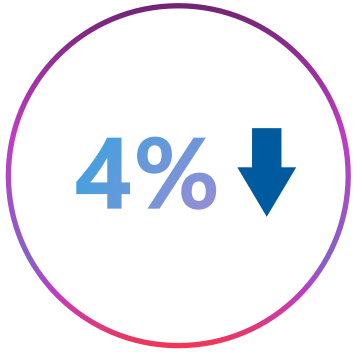
Queries per hour per core

Faster than the previous world record

Industry leading price-performance

TPC-H 3TB

$ cost per thousand queries per hour



Lower price-performance than the previous record

All claims are valid as of November 18, 2025, and based on non-clustered 10TB TPC-H publications. The benchmark is based on AMD EPYC and HPE ProLiant DL385 Gen11 (https://www.tpc.org/3410).

All claims are valid as of November 18, 2025, and based on non-clustered 3TB TPC-H publications. The benchmark is based on AMD EPYC and HPE ProLiant DL385 Gen11 (32-core: https://www.tpc.org/3408; 64-core: https://www.tpc.org/3409).

Built-in AI

Enable more intelligent semantic search in AI applications using your data

Accelerate development by integrating with leading AI frameworks

Embed AI model definitions into T-SQL to enable integration with any model

AI built-in

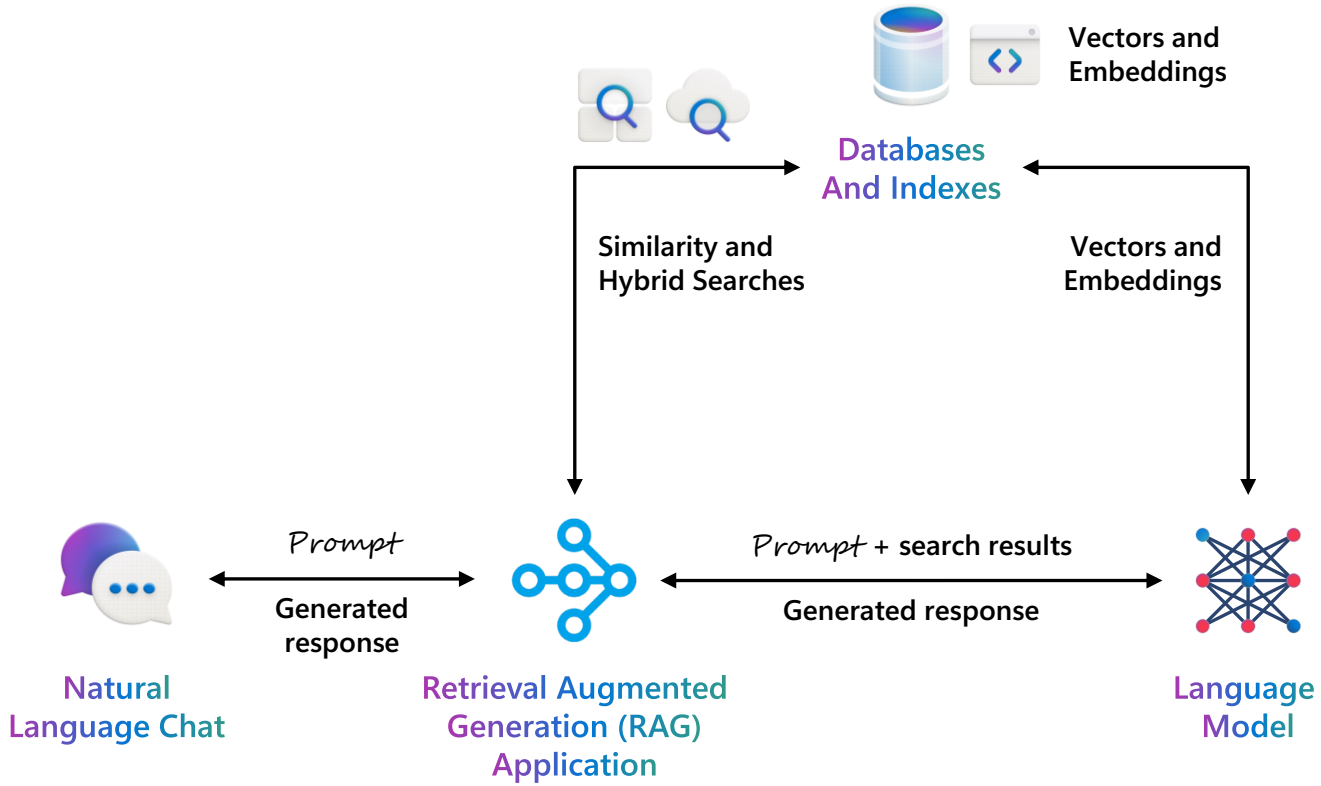
Build RAG patterns with the security and performance of SQL Server

Challenge

- Separating semantic and relational data leads to **higher latency** and **degrades user experience**
- Code-based integration **limits AI model testing**, delaying time-to-market

Solution

- Enable seamless integration with any AI model using a **consistent, declarative approach**
- **New vector type** and **functions** unify semantic and relational data to reduce operations complexity
- Speed up semantic queries with **Disk Approximate Nearest Neighbor (DiskANN) search**



Made for developers

Enrich relational data with other modern data sources using native JSON support and built-in REST APIs

Build real-time, event-driven modern apps with change event streaming

SQL Server is the only database that delivers consistent AI capabilities across on-premises and the Microsoft Cloud

Made for developers

Develop modern data applications

Challenge

- Inefficient JSON handling complicates **data integration** and delays **application delivery**
- Change Data Capture (CDC) I/O overhead limits **real-time application performance**

Solution

- Native **JSON data type** enables more efficient storage and manipulation of JSON data
- **External REST endpoint** allows for the native invocation of any REST endpoints
- **Change event streaming** enables real-time data integration by streaming data changes

Developer features in SQL Server 2025

JSON

JSON type, index and T-SQL functions

Change event streaming

Consume log change events

REST API

Connect your data to any REST interface

T-SQL

Regular Expression and more

External services

Azure Event Hubs

Kafka

Azure AI Foundry

Azure Functions

Cloud agility through Azure

Real-time, zero-ETL data replication with Fabric mirroring

Azure Arc extends cloud manageability and scalability to SQL Server running anywhere

Flexible cloud billing through Azure Arc shifts CAPEX to OPEX

"Fabric mirroring for SQL Server 2025 helps MSC to build the bridge to bring our operational data into Microsoft Fabric."

—Javier Villegas, IT Director of DBA and BI Services, Mediterranean Shipping Company

Integrated with Microsoft Fabric

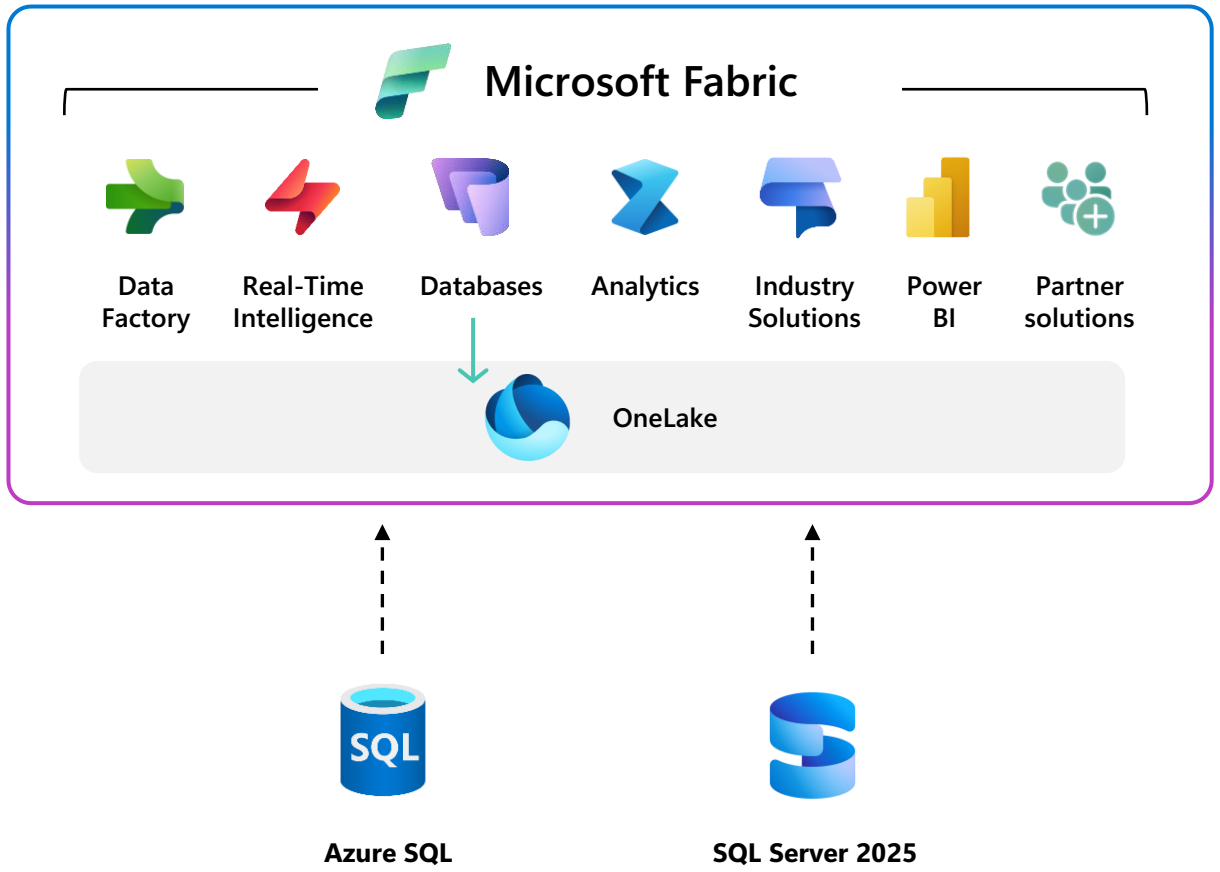
Integrate your operational data with a unified data platform

Challenge

- **Complex ETL/ELT** process for data replication
- Lengthy **data refresh cycle** for data transfer and analytics
- **Significant costs** incurred from transferring data

Solution

- **Mirroring** replicates databases to Fabric with zero ETL, offloading analytical workloads from operational databases
- Data is replicated into **OneLake** and kept up-to-date in near real-time
- Compute replication is included with your Fabric capacity **for no cost**



Hybrid by design

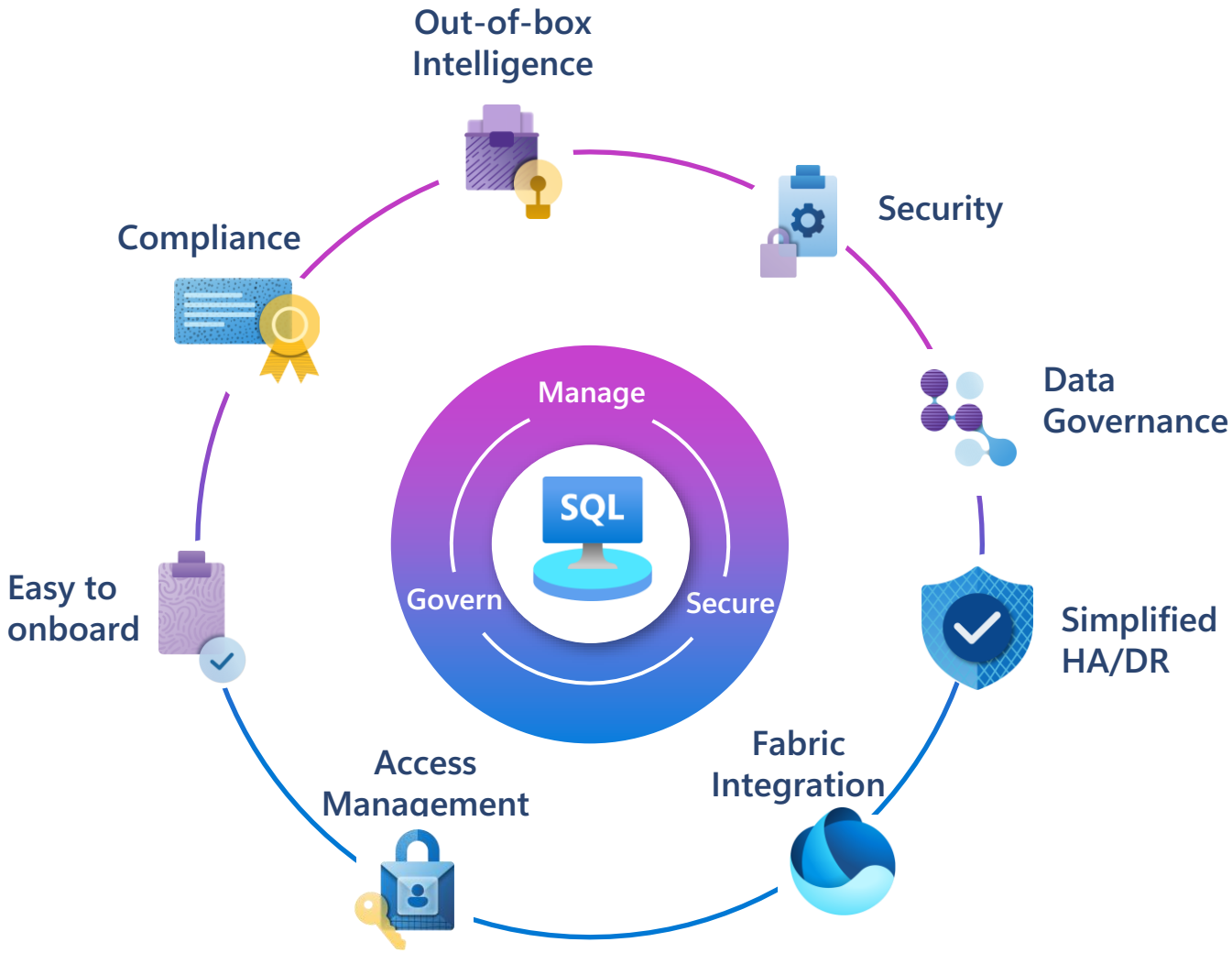
Azure Arc extends Azure to SQL Server anywhere

Challenge

- Managing SQL Server across environments is **operationally complex**
- **Lack** of unified threat **protection**
- Patching and compliance **slow down operations** and **reduce uptime**

Solution

- **Centrally manage** all SQL Server instances via the Azure Portal
- Leverage **Microsoft Defender** for vulnerability assessments and threat detection
- Gain **visibility** into SQL Server versions, configurations and performance



SQL Server 2025 editions

The AI-ready enterprise database from ground to cloud

Express

Free, entry-level database for small AI, web and mobile apps

Feature highlights

- 50 GB maximum relational databases size **NEW**
- Up to 4 cores of CPU
- Up to 1410 MBs of memory
- Built-in vector search and semantic search **NEW**
- Native JSON type support **NEW**
- External REST endpoint invocation **NEW**
- Change event streaming **NEW**
- Microsoft Entra ID authentication **NEW**
- Mirroring in Fabric **NEW**

Standard

Full featured database with extensive scale for mid-tier applications

Feature highlights

+ Express features

- Up to 32 cores of CPU **NEW**
- Up to 256 GB of memory **NEW**
- Optimized locking **NEW**
- Resource Governor **NEW**
- Backup Compression Algorithm ZSTD **NEW**
- Basic Availability Groups
- Azure SQL Managed Instance link
- Buffer Pool Parallel Scan
- Backups to S3-compatible object storage
- 524 PB maximum relational databases size

Enterprise

Highest performance and scaling for business-critical workloads

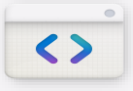
Feature highlights

+ Express and Standard features

- Highest core count supported
- Highest memory supported
- Built-in Intelligent Query Processing
- Online and Resumable Index Operations
- Availability Groups: including distributed and contained
- Query Store for readable secondaries
- Persisted Statistics for Secondary Replicas (Query store)

Developer

Free to use for dev/test in non-production environments



Standard Developer **NEW**

Enterprise Developer

SQL Server Management Studio 22

Tooling for your team to build AI apps, faster

New features

Always Encrypted Assessment

Migration Assistant

Git and TFS

GitHub Copilot (Preview)

aka.ms/ssms22

SQL Server 2025 expands access to Power BI Report Server for rich, interactive reporting

	SQL Server Reporting Service	Power BI Report Server
Report Authoring in RDL	Y	Y
Row-Level Security	Y	Y
Paginated Reports	Y	Y
PBIX Reports	N	Y
Data Modeling	N	Y
Visual Interactivity	N	Y
Custom Visuals	N	Y

Power BI Report Server delivers rich, customized paginated and **interactive reports**

New! Any customer with a paid SQL Server 2025 license will now have access to Power BI Report Server

Migrate from SQL Server Reporting Services to Power BI Report Server in straightforward steps

Learn more here

SQL Server 2025

The AI-ready enterprise database from ground to cloud

Best-in-class security and performance

The most secure database over the last decade*, with best-in-class performance

Authentication through **Microsoft Entra Managed Service Identity**

Improved app concurrency via **Optimized Locking**

Accelerated performance via **Batch Mode** and faster query processing

Increased uptime via **Reliable Failover** enhancement

AI built-in

Accelerate AI apps using extensible tools with built-in vector capabilities

Enhanced intelligence via **Hybrid vector and full-text search**

Flexible **interfaces for AI models**, deployed locally or on clouds

Simplified workflows with **integrated vector embedding**

Support for **Langchain, Semantic Kernel** and **Entity Framework Core**

Made for developers

Streamline developer workflow to build modern data applications

Efficiently process **JSON** data with **native type, index** and **functions**

Extensibility by connecting data to any **REST interface**

Efficient querying of diverse datasets using **Regular Expression (RegEx)**

Build real-time event-driven apps with **Change Event Streaming**

Cloud agility through Azure

Enable frictionless analytics and cloud agility through Fabric and Azure Arc

Real-time data replication with **Fabric database mirroring**

Centralized management, security and automation using **Azure Arc**

Disaster recovery and read scale-out to **Azure SQL**

Simplified licensing using Azure Arc **Pay-As-You-Go**

* As of July 2025, according to the National Institute of Standards and Technology (NIST) National Vulnerability Database (vulnerability incident counts 2016–2025: SQL Server 62; MySQL 1193; Oracle 198; IBM 197; PostgreSQL 195; SAP 78).

Top 5 Reasons to Upgrade to SQL Server 2025 Today

#1 Most secure database over the last decade[1]

SQL Server 2025 continues its legacy of top-notch security by incorporating modern identity and encryption practices

40+ Enhancements made to the database engine[2]

SQL Server 2025 delivers over 50 database engine enhancements—many driven by customer feedback.

#1 New feature requested: AI built-in

Preview customers ranked SQL Server 2025's built-in AI—especially semantic search and in-engine model management—as the top new feature.

#1 Most significant release for SQL developers in the last decade

SQL Server 2025 significantly reduces code complexity and improves developer productivity.

2x More downloads than SQL Server 2022[3]

SQL Server 2022 set a high bar for adoption—SQL Server 2025 raises it even higher.

1) As of July 2025, according to the National Institute of Standards and Technology (NIST) National Vulnerability Database (vulnerability incident counts 2016–2025: SQL Server 62; MySQL 1193; Oracle 198; IBM 197; PostgreSQL 195; SAP 78).
2) What's new in SQL Server 2025
3) Sathy, Priya, "Accelerating SQL Server 2025 momentum: Announcing the first release candidate," Microsoft.com, 2025

Call to Action

Download it today:
aka.ms/getsqlserver2025

Check out our blog
aka.ms/sqlserver2025

Read the docs:
aka.ms/sqlserver2025docs

Microsoft

Thank you

SQL Server 2025

The AI-ready enterprise database from ground to cloud

Preview

Hero Use Case & Capability

Best-in-class security and performance

The most secure database over the last decade*, with best-in-class performance

Enable credential-free, inbound and outbound authentication

Microsoft Entra ID
Managed Identity

AI built-in

Accelerate AI using your own data across any model with familiar T-SQL language

Perform intelligent semantic search along full text search

Model management isolated from SQL engine

Made for developers

Streamline developer workflow to build modern data applications

Develop real-time, event-driven agentic applications

Change Event Streaming

Cloud agility through Azure

Enable frictionless analytics and cloud agility through Fabric and Azure Arc

Build scalable analytics by centralizing data

Mirroring in Fabric

Connected with Arc | **Assisted by Copilots** | **Benchmark leader** | **Optimized for latest hardware** | **Built for all platforms**

* According to the National Institute of Standards and Technology Comprehensive Vulnerability Database, as of November 2024

Feature Glossary

Capabilities	Description
Native vector support/embedding*	This new capability allows SQL Server to generate and natively store vector embeddings, enabling customers to run generative AI models using their own data.
DiskANN index	A vector search technology using disk storage to efficiently find similar data points in large datasets.
Extensible model management	Flexible AI model management within the engine using Representational State Transfer (REST) interfaces allows you to use AI models from ground to cloud.
Semantic search*	Semantic search is a search technology that goes beyond traditional keyword-based search by understanding the meaning and context of the search query.
AI language frameworks	The new release enhances developers' ability to create various AI applications through seamless integration with popular AI frameworks like LangChain, Semantic Kernel, and Entity Framework Core.
GraphQL / Data API Builder (REST)*	External REST Endpoint Invocation lets you call REST/GraphQL endpoints from other Azure services from right in the SQL Database.
Native JSON support*	The new native JSON data type that stores JSON documents in a native binary format. The JSON type provides a high-fidelity storage of JSON documents optimized for easy querying and manipulation.
Microsoft Entra ID Managed Identity*	Support for Microsoft Entra managed identities improves credential management, reduces potential vulnerabilities, and provides compliance and auditing capabilities. SQL Server 2025 introduces outbound authentication support for MSI (Managed Service Identity) for SQL Server enabled by Azure Arc.
Regular Expression support*	Regular expressions (regex) A regular expression, or regex, is a sequence of characters that defines a search pattern for text. Query SQL Server with regex to find, replace, or validate text data.
Optional Parameter Plan Optimization (OPPO)	Designed to enable SQL Server to choose the optimal execution plan based on customer-provided runtime parameter values and to significantly reduce bad parameter sniffing problems that can exist in workloads.
Persisted statistics on secondary replicas	To prevent the loss of statistics during a restart or failover, thereby avoiding potential performance degradation.
Columnstore improvements*	Support for ordered nonclustered columnstore indexes; Online index rebuild for ordered columnstore indexes; Improved database and file shrink operations
Optimized Locking*	Reduces lock memory consumption and minimizes blocking for concurrent transactions through Transaction ID (TID) Locking and Lock After Qualification (LAQ). This capability enables customers to increase uptime and enhance concurrency and scale for SQL Server applications.
Change event streaming	brings real-time application integration with event driven architectures, command query responsibility segregation, and real-time intelligence.
Fabric Mirroring	A fully managed, resilient process that simplifies SQL Server data replication to Microsoft OneLake in near real-time.
Copilot in SSMS*	The Copilot experience streamlines SQL development by offering real-time suggestions, code completions, and best practice recommendations.

* Included in CTP 1.0; other features will be released in Public Preview or GA timeframe

Security, SQL, and AI

- You control *all access* with SQL security
- You control *which* AI models to use
- AI models ground *and/or* cloud *isolated* from SQL
- Use RLS, TDE, and Dynamic Data Masking
- Track *everything* with SQL Server Auditing
- Ledger for chat history and feedback

Enhancing the industry proven engine (selected)

Security

- Security cache improvements
- OAEP support for encryption
- PBKDF password hashing
- Authentication using system-assigned managed identity
- Backup to URL with managed identity
- Managed identity support for EKM
- Entra logins with nonunique display names
- Custom password policy on Linux
- TDS 8.0/TLS 1.3 support for tools

Performance

- Optimized Locking
- Tempdb space resource governance
- ADR in tempdb
- Persisted stats for readable secondaries
- Change tracking cleanup
- Columnstore index maintenance
- CE feedback for expressions
- Optional parameter plans optimization
- DOP feedback on by default
- Optimized Halloween protection
- Query store for readable secondaries
- ABORT_QUERY_EXECUTION query hint
- Optimized sp_executesql
- Batch mode optimizations
- Remove In-Memory OLTP from a database
- tmpfs support for tempdb in Linux

HADR

- Fast failover for persistent AG Health
- Async page request dispatching
- Improved health diagnostics
- Communication control flow tuning
- Switching to resolving state
- Remove listener IP address
- NONE for routing
- AG group commit waiting tuning
- Contained AG support for DAG
- DAG sync improvements
- Backups on secondary replicas
- ZSTD Backup compression