SQL database in Microsoft Fabric

Series Scenario – Conference session application

You need:

- to store and serve data for the conference webpage.
- to be able to run analysis over the data.
- an application that allows attendees to easily search for and find sessions of interest to them.
- to follow modern best practices for application lifecycle.
- to be able to monitor and troubleshoot database and query performance.

Course Overview and agenda

Episode 1: Introduction and Overview; Getting started

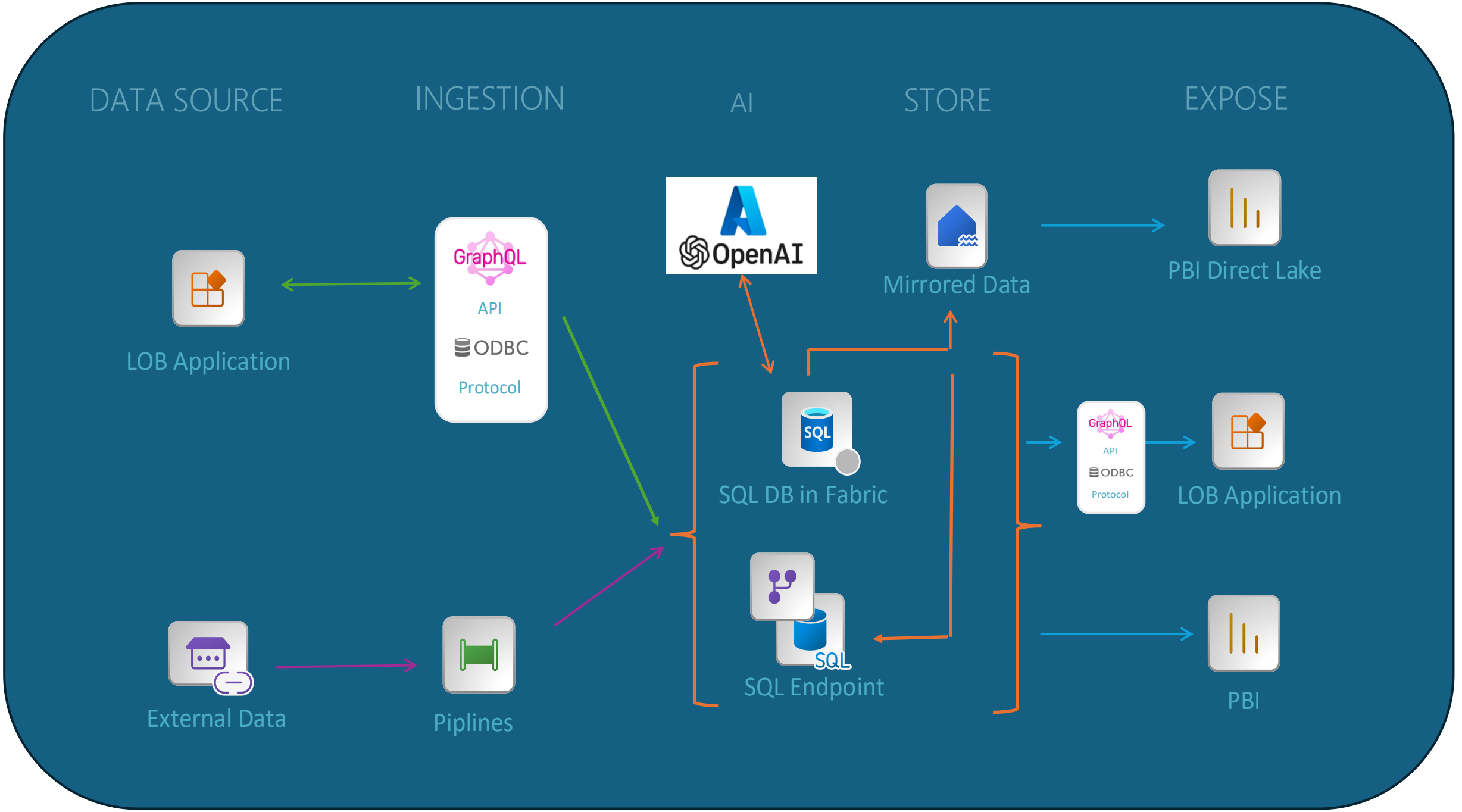
Episode 2: Dataflows, Notebooks, Reports

Episode 3: GenAI and vector databases

Episode 4: GraphQL and application development

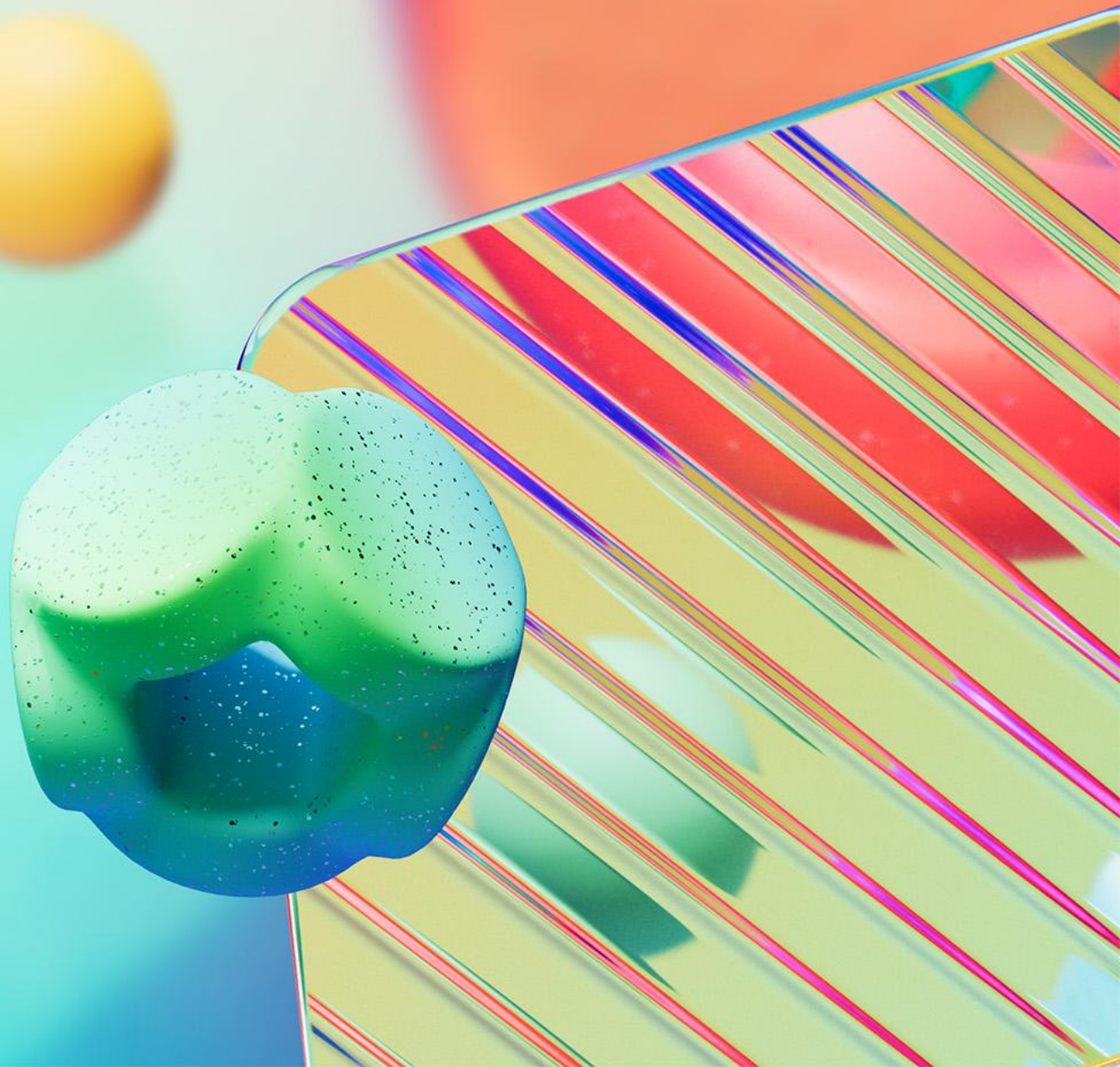
Episode 5: Application lifecycle management

Episode 6: Performance Dashboard, Recap


DATA SOURCE
INGESTION
AI
STORE
EXPOSE
LOB Application
GraphQL
API
ODBC
Protocol
OpenAI
Mirrored Data
PBI Direct Lake
SQL
SQL DB in Fabric
GraphQL
API
ODBC
Protocol
LOB Application
SQL
SQL Endpoint
External Data
Piplines
PBI

Episode1: Introduction to SQL database in Fabric

Introducing
SQL database in Fabric



1 B

new apps will be built in the next 5 years

87%

of leaders believe AI will give their organization a competitive edge

Source: https://www.idc.com/getdoc.jsp?containerId=US51953724

Source: Building a high-performance data and AI organization, MIT Technology Review, April 2021

Microsoft

Microsoft SQL – ground to cloud to Fabric

The next generation AI database platform

Intelligent ground

Intelligent cloud

Intelligent Fabric

Develop once deploy anywhere

SQL Server

SQL on Linux, containers, k8s

SQL Server enabled by Azure Arc

Azure Arc-enabled SQL managed instance

SQL Server on Azure VM

Azure SQL managed instance

Azure SQL database

Fabric SQL database NEW

T-SQL

Developers

Engine

Tools

Copilots

AI

Fabric

Microsoft Fabric

Data Factory

Real-Time Intelligence

Databases

Analytics

Industry Solutions

Power BI

Partner solutions

Copilot in Fabric

OneLake

Microsoft Purview

SQL database in Microsoft Fabric

Build AI applications faster and more efficiently on a software-as-a-service database

71%

faster task completion

63%

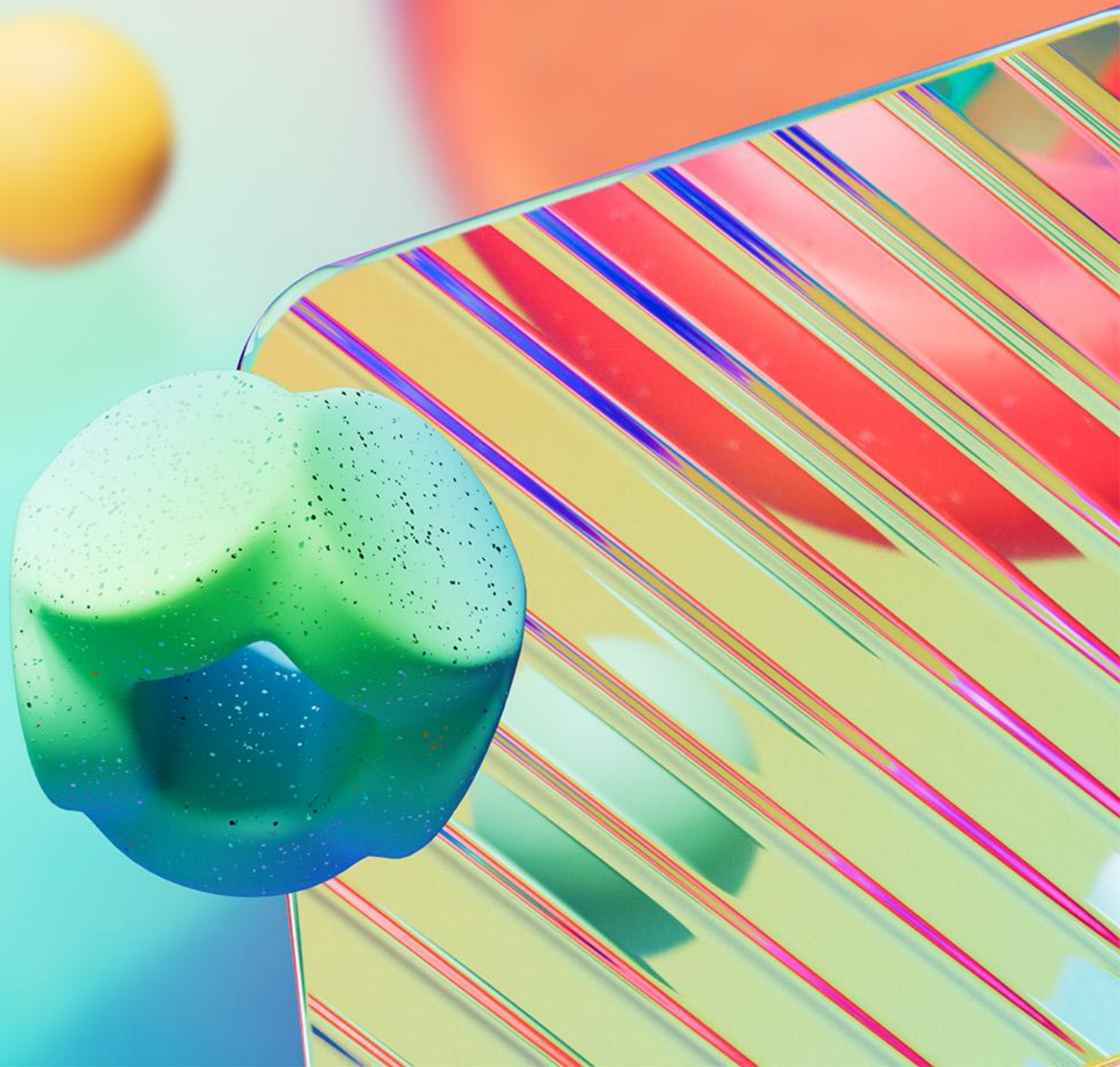
more accurate task completion

83%

more confidence in completing tasks

SOURCE: Based upon n=210 user studies conducted with technical practitioners by Microsoft Corporation in October 2024 that measured time to complete four common tasks associated with AI application development on a SQL database in Microsoft Fabric and on Azure SQL Database. Actual results may vary based upon individual performance and sentiment.

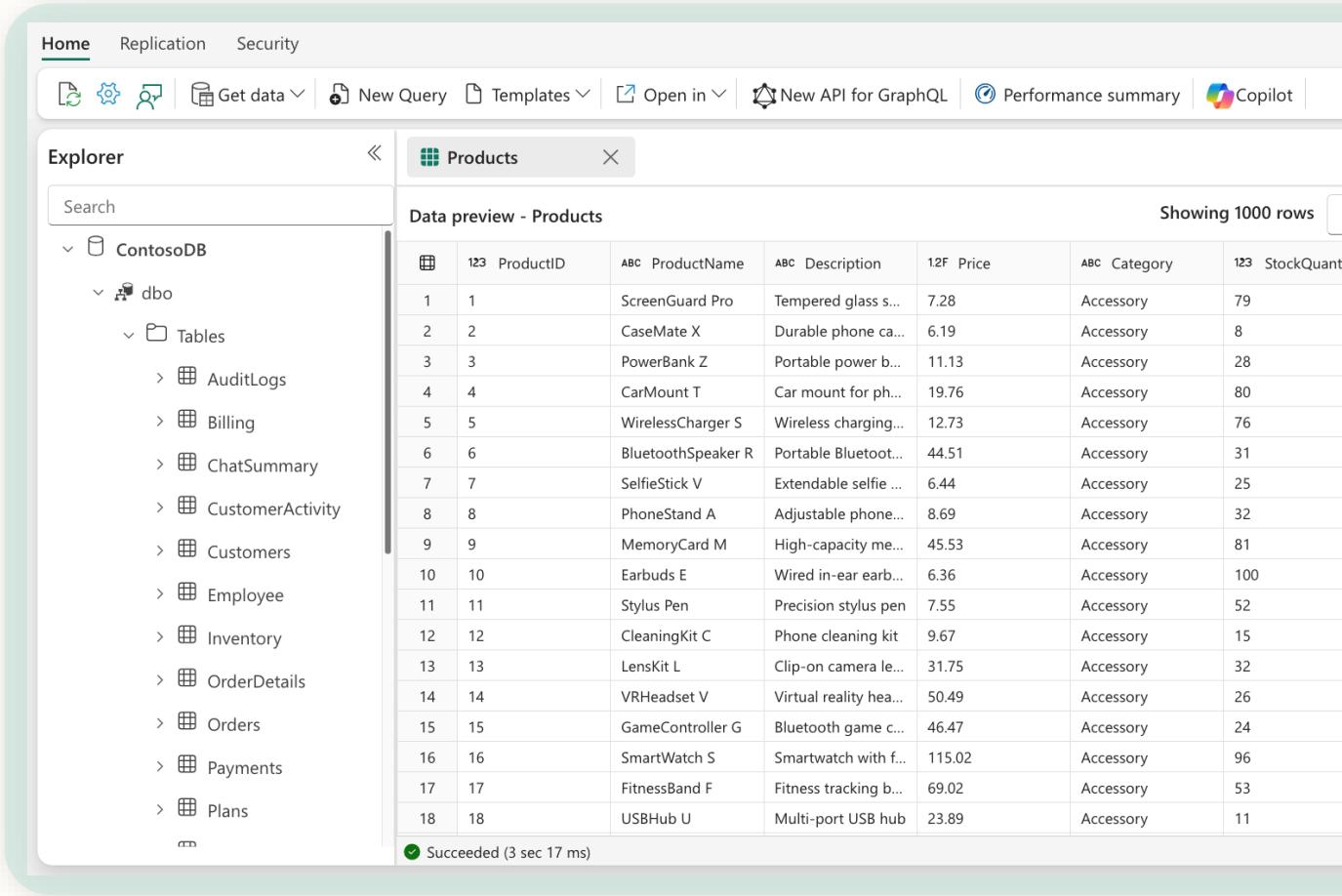
Simple



Focus on building your app

A simple, integrated developer experience

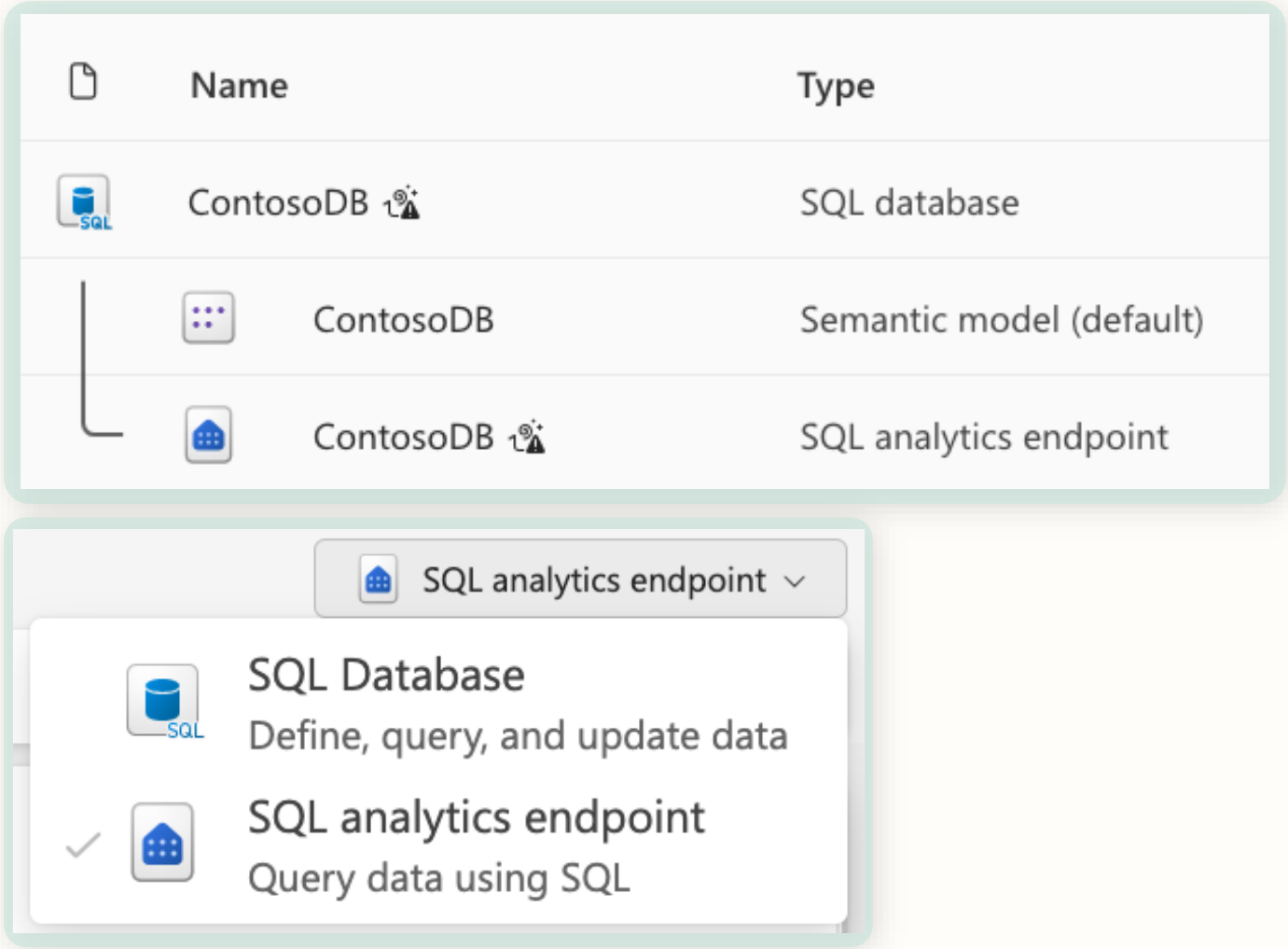
- Easy provisioning
- AI assistance
- Integrations from the editor
- T-SQL support



Replication to OneLake

Near real-time replication to OneLake by default, seamless integrations with the rest of Fabric

- Unified operational and analytics
- Data replicated to open-source Delta
- Shortcuts to query the data without copying it



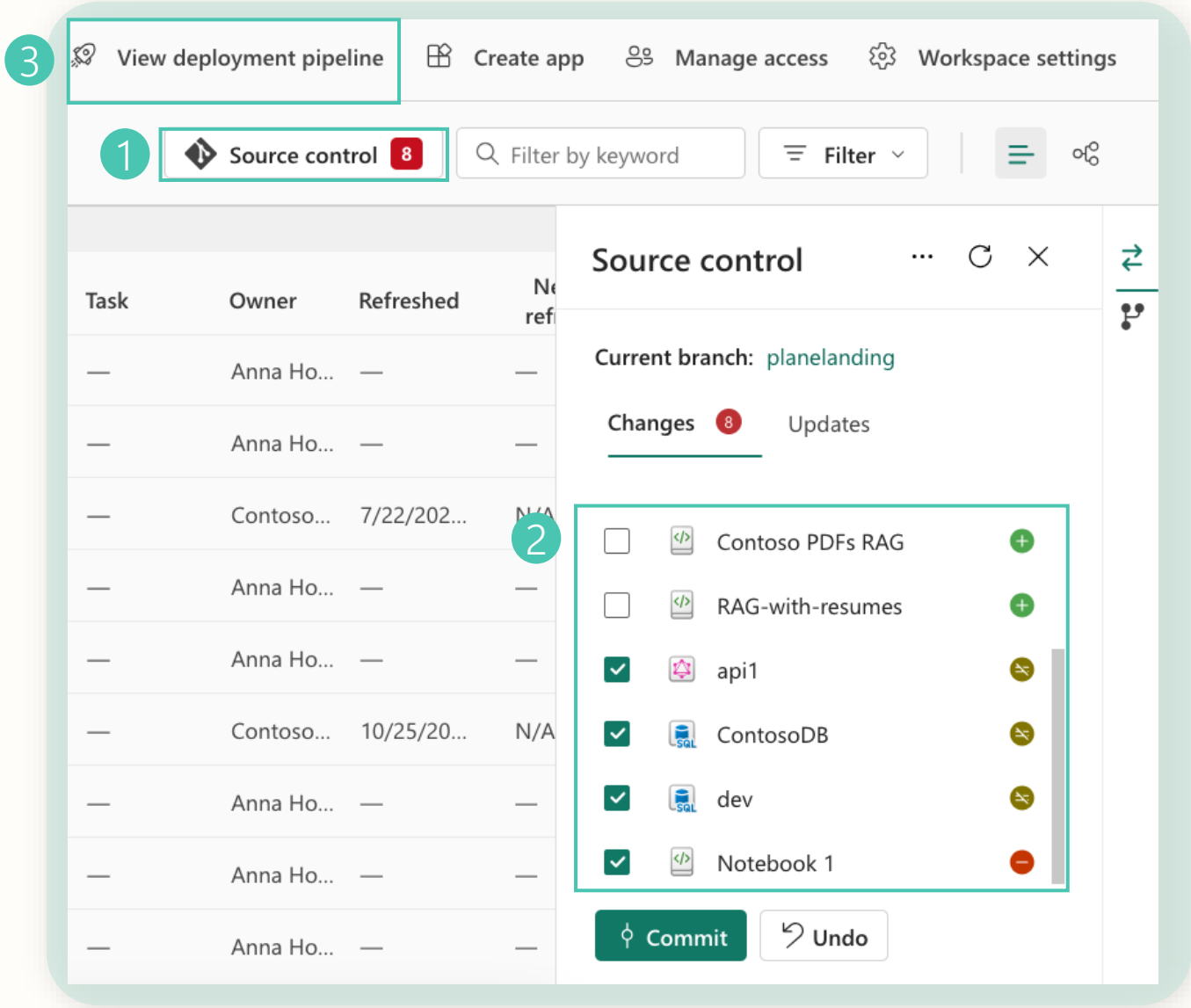
Application lifecycle management

Every database under source control

Source control integration in the Fabric web interface (GitHub and Azure DevOps)

Database code editing in developer tooling

SqlPackage command line tool



Microsoft Fabric capacity model

Microsoft Fabric is a unified product for all your data and analytics workloads. Rather than provisioning and managing separate compute for each workload, with Microsoft Fabric, your bill is determined by two variables: the amount of compute you provision and the amount of storage you use.

COMPUTE

A shared pool of capacity that powers all capabilities in Microsoft Fabric.

Pay-as-you-go and 1-year Reservation.

STORAGE

A single place to store all data.

Pay-as-you-go ($ per GB/month).

SQL database in Fabric is a **game-changer**

Hitachi Solutions

"The ability to automatically replicate data for near-real-time analytics while maintaining a simple and intuitive management experience is a **game-changer**.

This integration not only enhances our ability to derive insights quickly but also streamlines our data operations, reducing overhead and boosting productivity … SQLDB in Fabric just works!

Ian Santillan
Data Architect

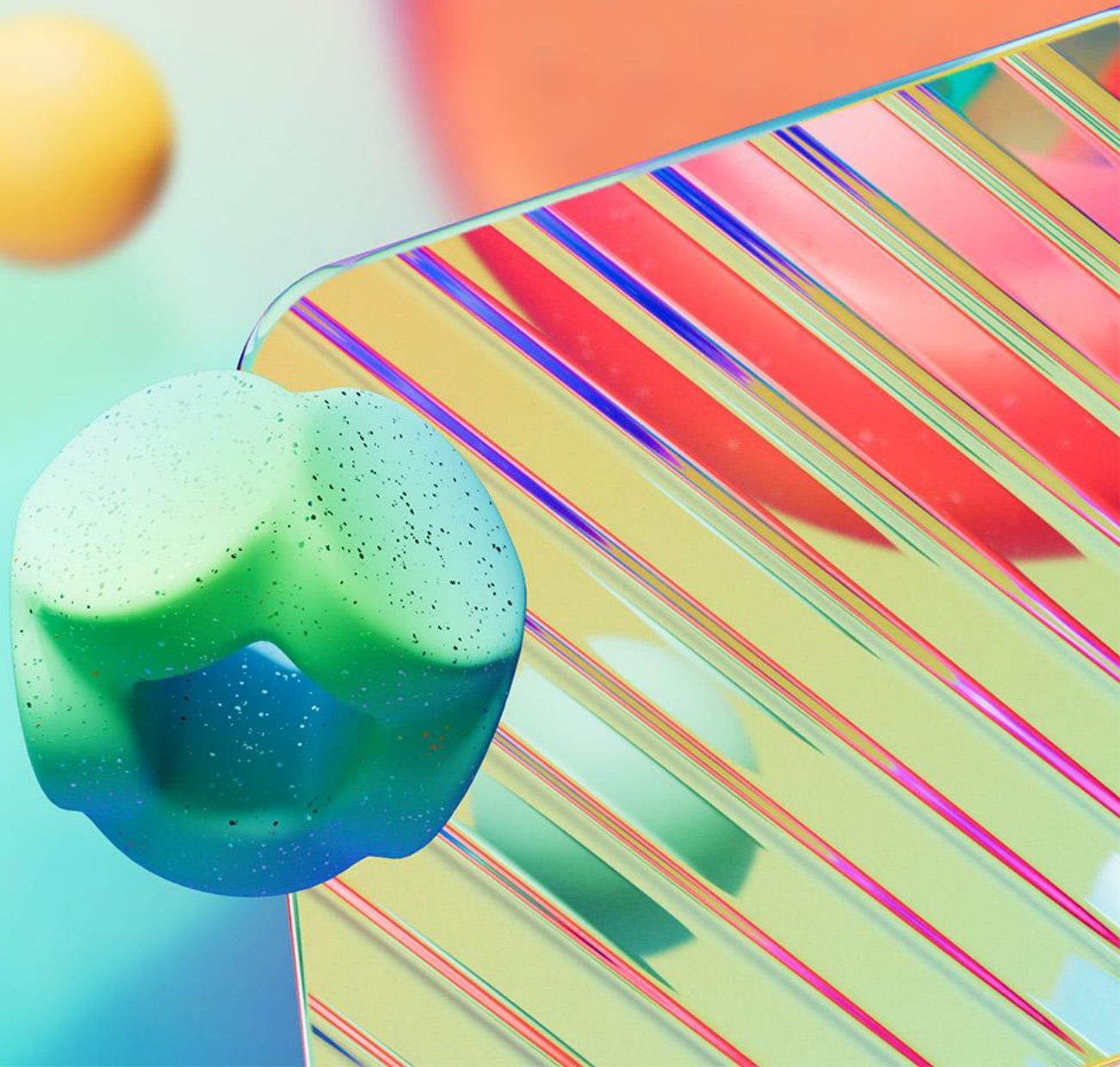
Save the Children

"I'm excited about the unification of transactional and analytical data within Fabric SQL DB. This has been a **game-changer** for us, allowing us to manage large-scale Finance Management System (FMS) data without the complexity of traditional ETL processes.

The new capabilities have reduced rework of our processes and provided faster, more reliable insights, helping us be more responsive and impactful in our mission to improve children's lives globally."

Tariq Bhatti
Data Warehouse and BI Architect

Autonomous and secure



Autonomous capabilities manage your workloads

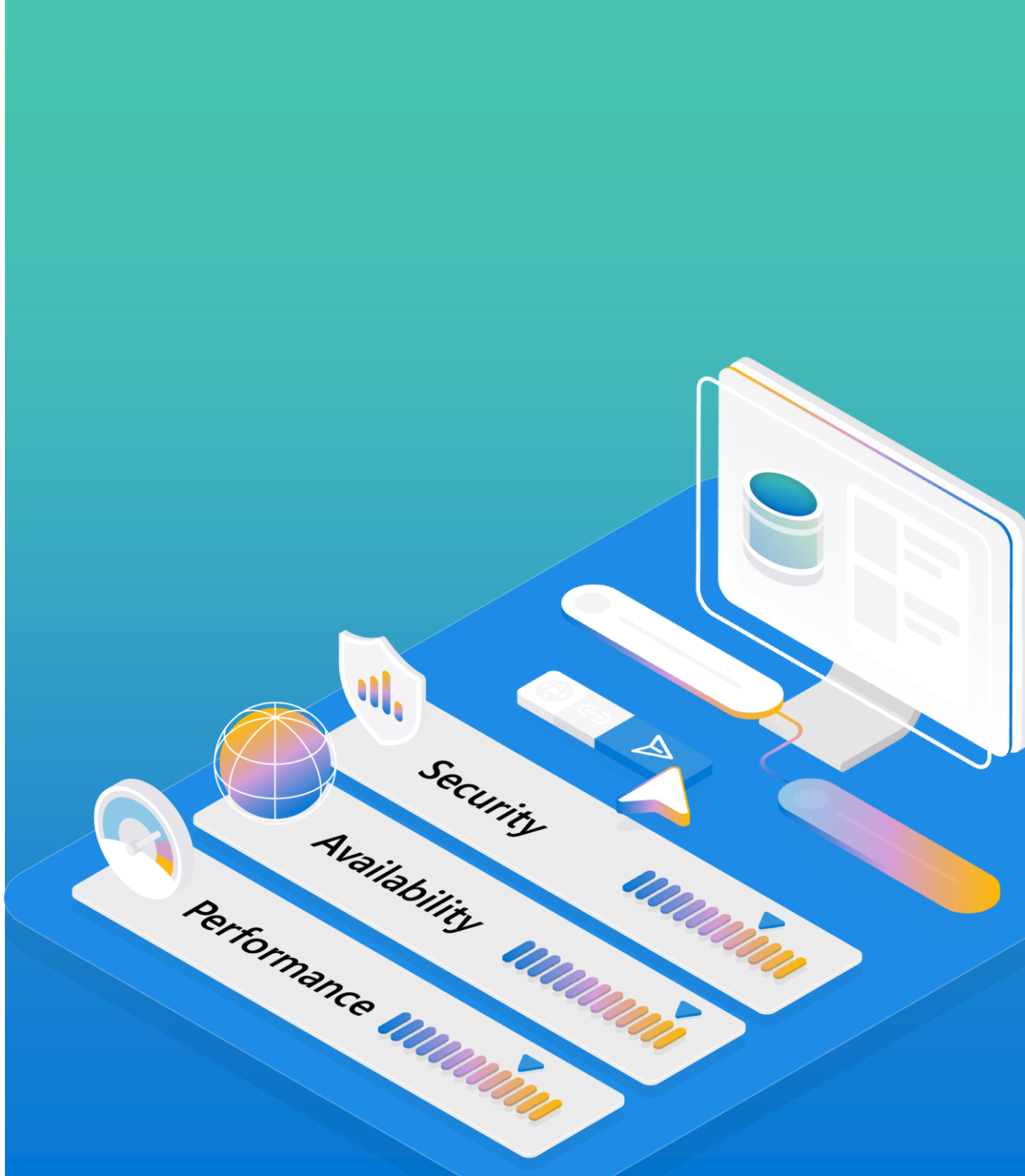
Challenge

Making the right choices and managing databases is complex.

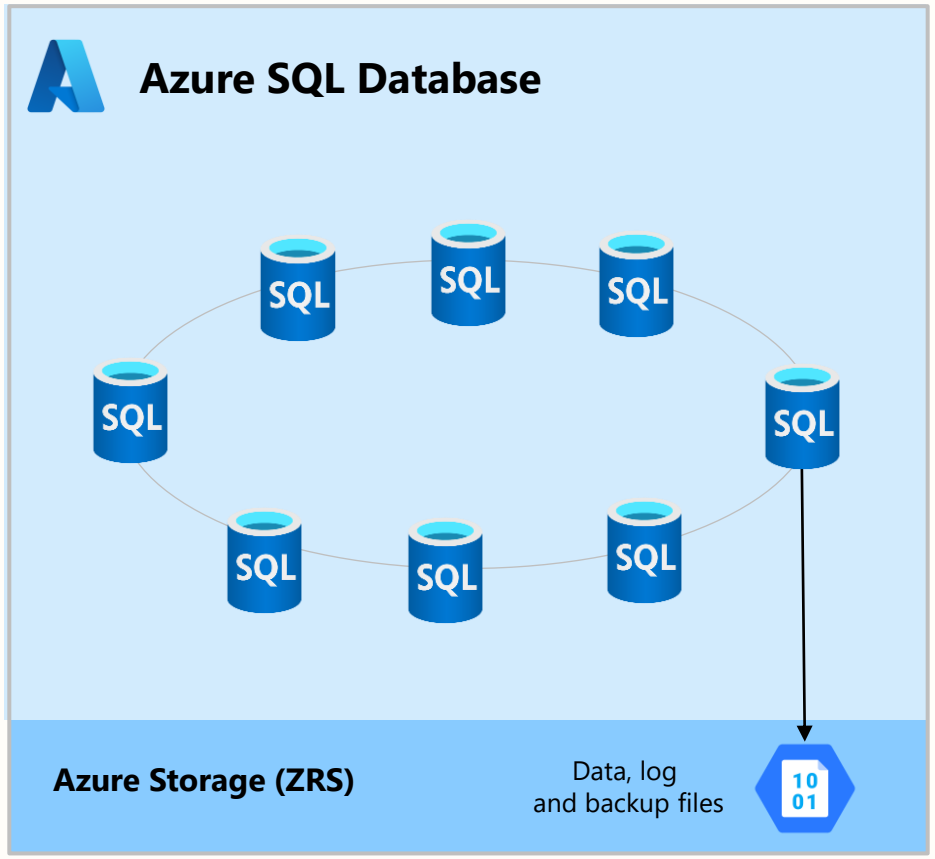
Solution

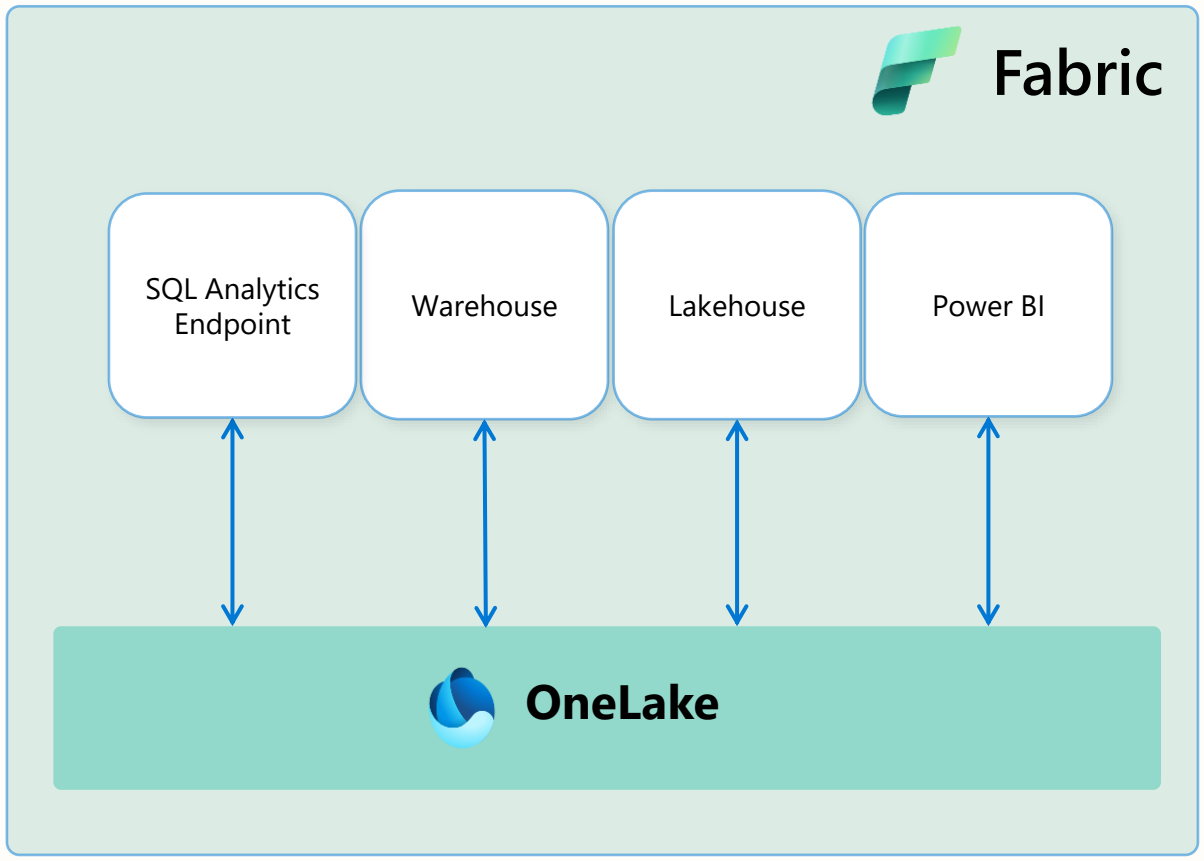
SQL database in Fabric enables you to get the best security, availability, and performance configurations

- Secure by default
- Auto-managed HADR
- Auto-scaling and auto-optimized

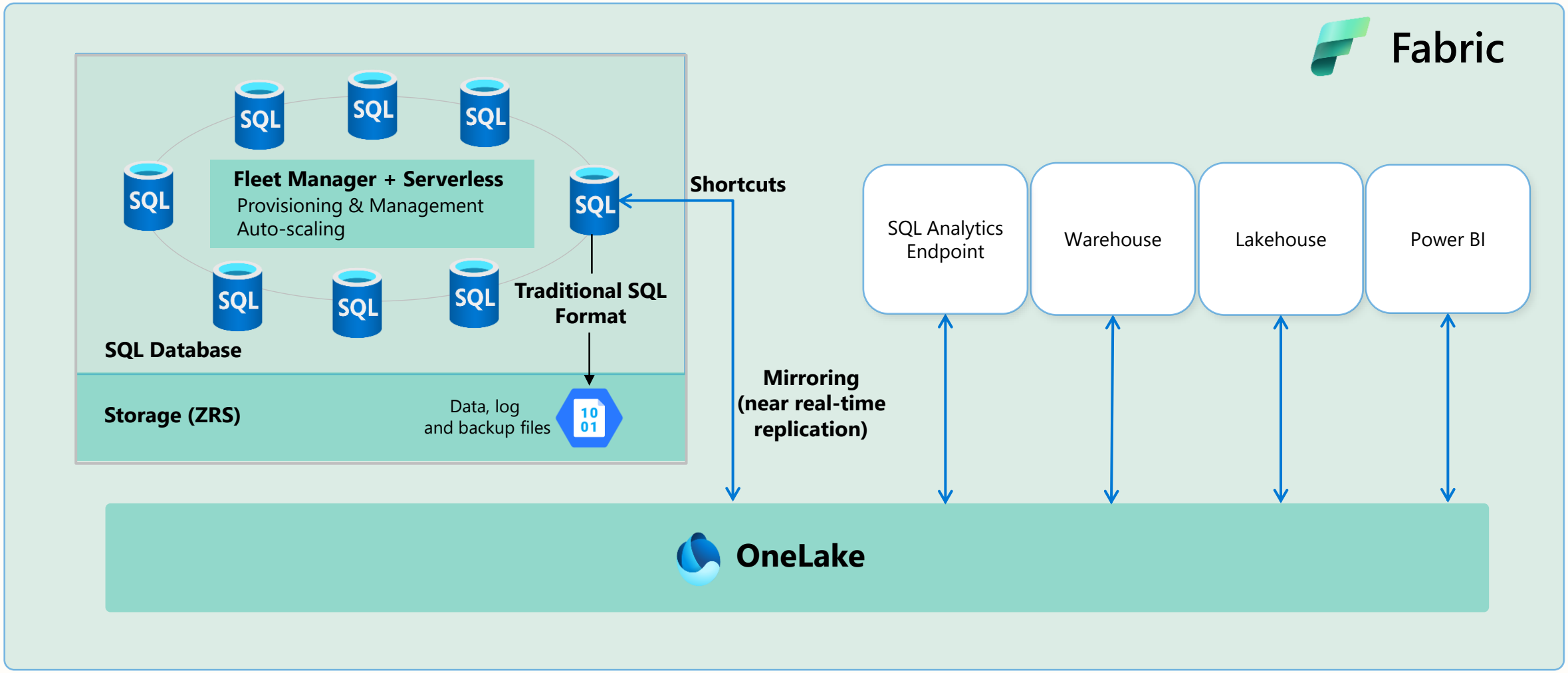


Architecture



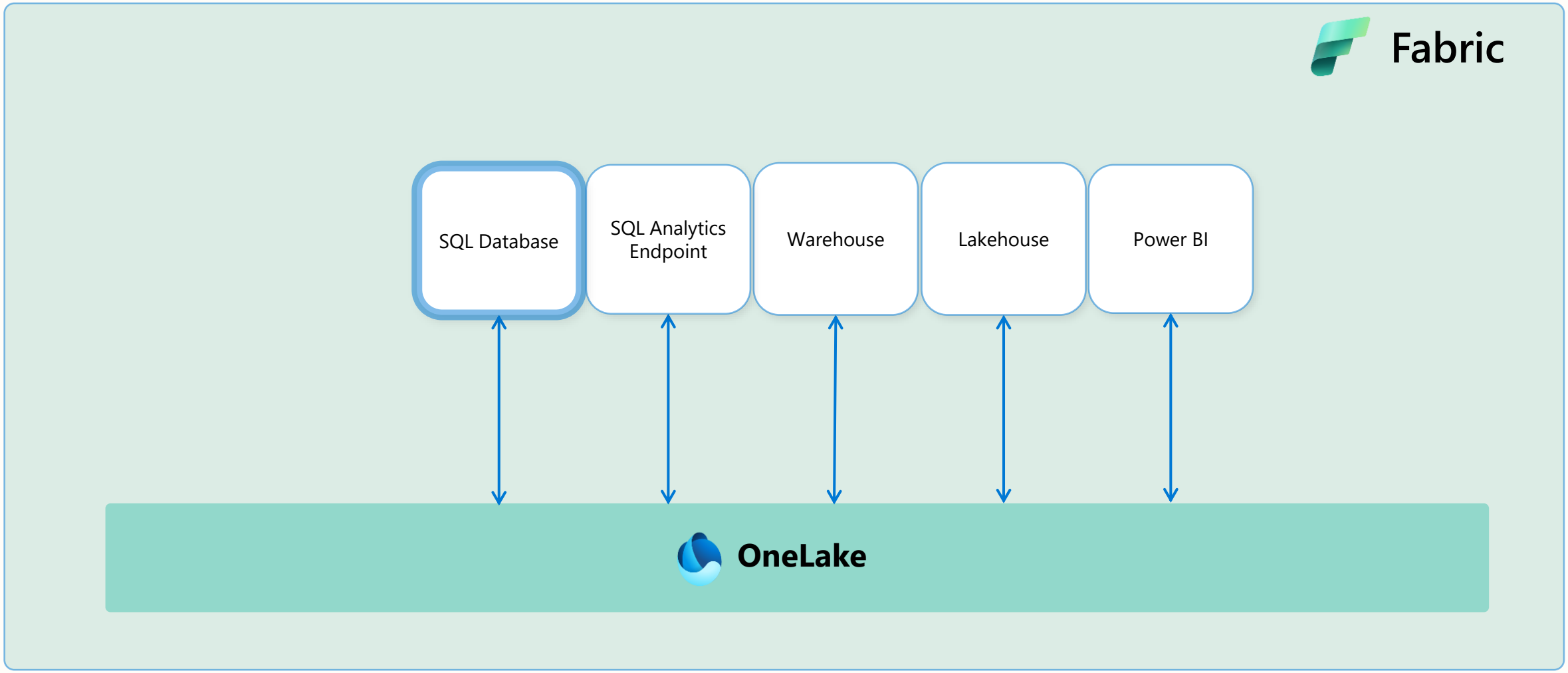


Architecture



The power of Fabric with no compromises on your SQL operational database

Architecture



The power of Fabric with no compromises on your SQL operational database

Secure and governed by default

Authentication

Microsoft Entra authentication *only*

- Central identity management
- Password-less authentication

Authorization

Workspace roles and item permissions for easy management

Proven SQL native features for granular access control

Network security

Private link-ready

All data encrypted in transit - TLS 1.2

Data encryption

All data encrypted at rest

Customer Managed Key support*

Auditing*

Enabled by default and customizable

Central governance

Microsoft Purview sensitivity labels

Centrally-managed protection policies

*Coming in 2025 H1

Autonomous

- Auto-scaling compute and storage
- Auto-HA with Zone Redundancy
- Secured and governed by default
- Auto-replicated to OneLake (no ETL)
- Auto-indexing
- Latest Intelligent Query Processing enhancements
- Auto-backups, point-in-time restore available
- Auto-patching

SQL database in Fabric improves your data estate

"Fabric SQL Databases help us improve our data estate in 3 ways:

1. Simplification

App Devs can leverage databases natively out of Fabric. This allows us to take advantage of data mirroring automatically to OneLake out of the box, making less work for developers to better innovate on behalf of our clients.

2. Minimizing Data Duplication

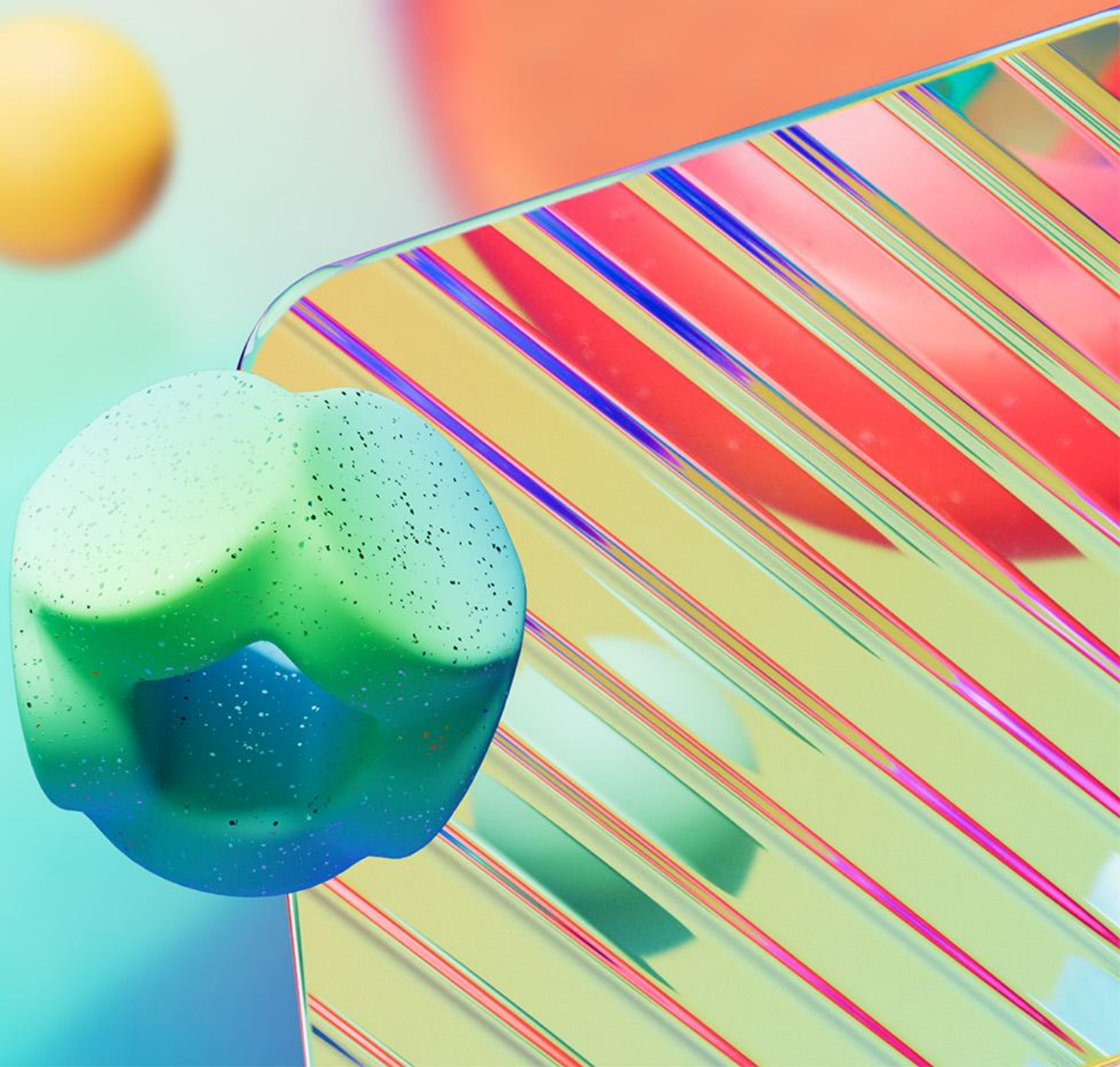
Aon is in the business of better decisions and by having Fabric control the data loads between Transactional and Analytic workloads, it minimizes any unnecessary data duplication that may happen to support both App Dev and Analytical scenarios.

3. Improving Performance

Fabric SQL Databases offer a hands-off approach to monitoring and scaling with how it consumes against virtual compute in the Fabric Capacity. The maintenance time to look at and maintain these simplifies allowing Aon to quickly adjust to market conditions and leverage leading tech."

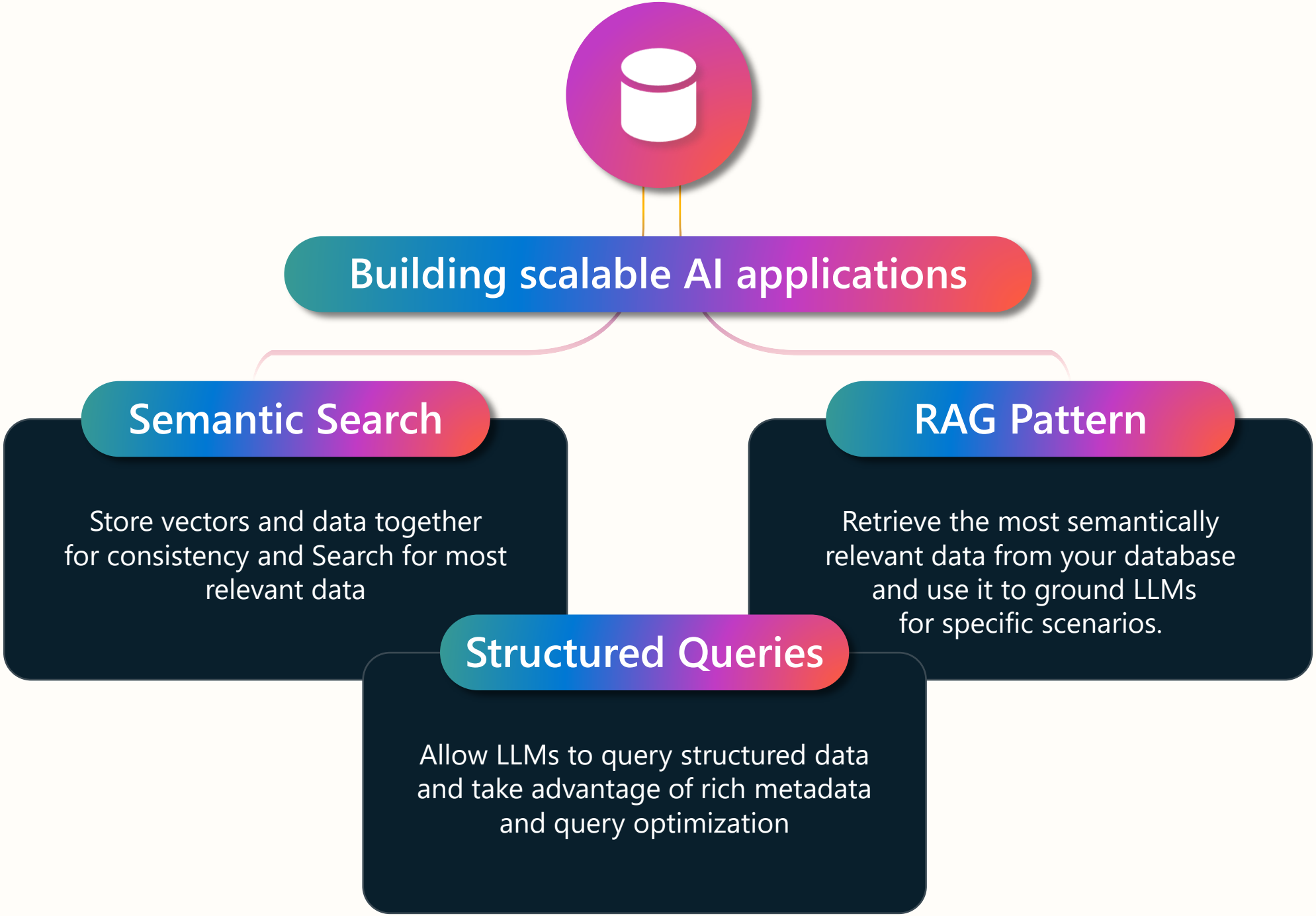
Boby Azarbod
Data Practice Lead and Data Architect at Aon

Optimized for AI



Build AI apps with SQL database in Fabric

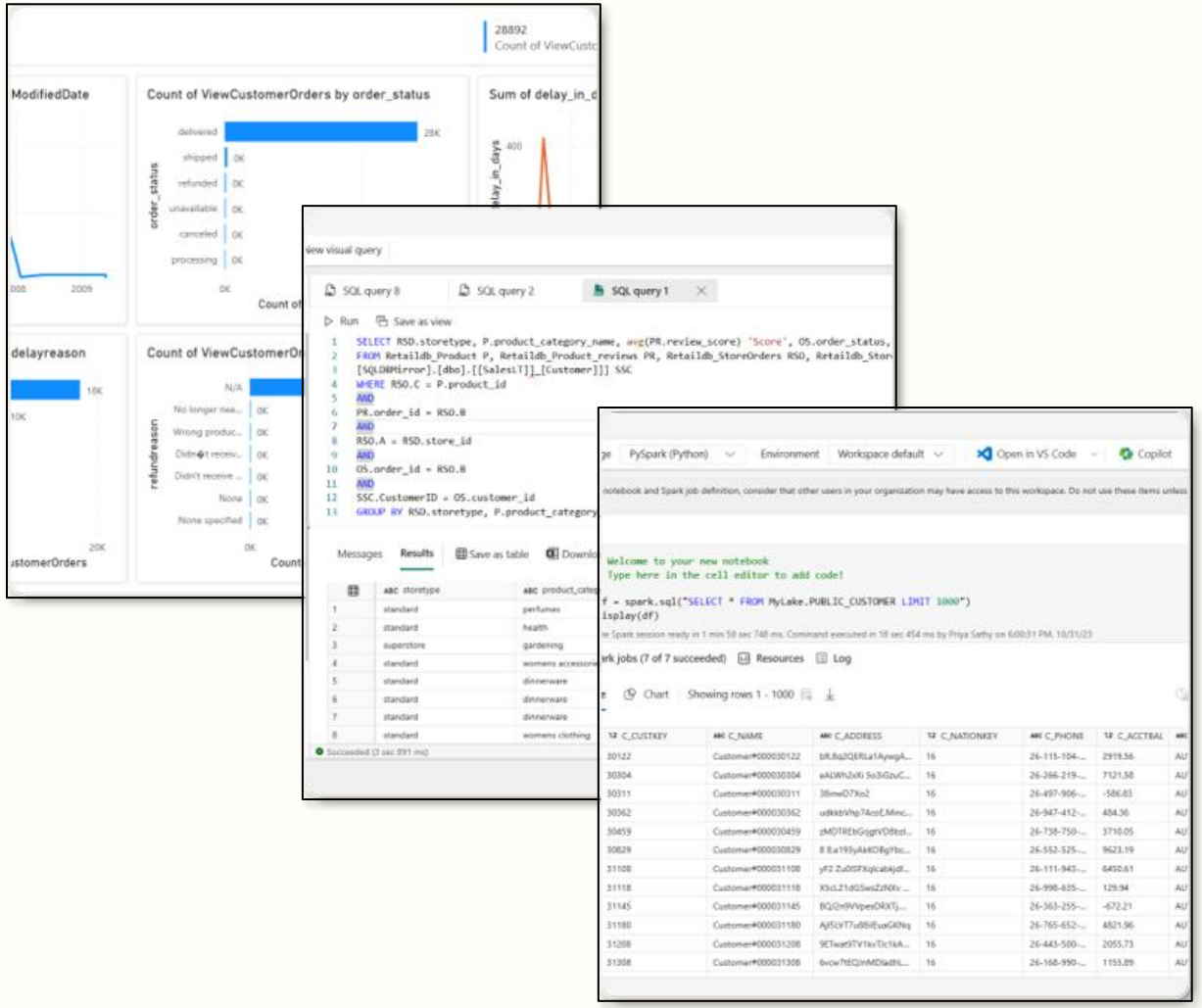
- Vector and RAG support
- Call models with REST support
- Integration with Azure AI services
- Integration with popular frameworks, like LangChain and Semantic Kernel


Building scalable AI applications
Semantic Search
Store vectors and data together for consistency and Search for most relevant data
RAG Pattern
Retrieve the most semantically relevant data from your database and use it to ground LLMs for specific scenarios.
Structured Queries
Allow LLMs to query structured data and take advantage of rich metadata and query optimization

Replication to OneLake: insights unlocked

Near real-time replication to Delta makes for seamless integration with Fabric

- Power BI Direct Lake mode
- Cross-database querying with multi-cloud shortcuts
- Data Science experiences with notebooks
- Integration with AI skills (coming soon)
- Data activator and Real-Time Intelligence



Anna Hoffman
anna.hoffman@microsoft.com

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PARTNER VIDEO

SQL database in Fabric customers

Prerequisites Check

Prerequisites

- **PowerBI Account**: *Power BI Sign in*. You will need a PowerBI account with existing Fabric capacity.
- **Enable SQL database in Your Fabric Tenant Settings**: *Instructions to enable SQL database in Microsoft Fabric*.
- **Microsoft Azure Account**: This workshop uses the *Microsoft Azure* platform to host the Azure OpenAI model we will use.
- **VS Code**: Install *Visual Studio Code* and the SQL Database Projects extension.
- **.NET 8 SDK**: Install the *.NET 8 SDK*.
- **Node.js**: Install *Node.js*.
- **git source control repository**: You will need access to an empty git repository in Azure DevOps or GitHub
  - **Azure DevOps**: *Azure DevOps* using same work account as Microsoft Fabric
  - **GitHub**: *GitHub* requires enabling GitHub integration in Microsoft Fabric settings

Create Workspace

Create Database

Create Initial Objects

End Episode 1

Introduction & Overview

Create workspace, database, and initial objects