



Microsoft Fabric Community Conference

Workshop:
**Build AI-Ready Apps with SQL database
in Microsoft Fabric (Hands-on)**



Workshop: Build AI-Ready Apps with SQL Database in Microsoft Fabric



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Agenda

01

Introduction

02

Workshop Overview

03

SQL database in Fabric Overview

04

Hands on Lab

05

Conclusion & Resources

Module 0

Pre-requisites



<https://aka.ms/FabConSQLDB>



FabCon Vienna 2025 Workshop: Build powerful AI-apps with SQL database in Fabric

Module 1: Getting started with SQL database in Fabric

Module 2: Working with data in SQL database in Fabric

Module 3: Utilizing Copilot capabilities for SQL database in Fabric

Module 4: Introduction to building GraphQL API

Module 5: RAG implementation with Azure OpenAI

Module 6: PowerBI reporting using semantic model

Module 7: Sentiment analysis with PowerBI and Translytical Taskflows

Module 8: ALM – Github Source Control Production Workloads

Module 9: Security – Access management

Module 10: Monitor your SQL database



Get to know each other

How many of you have used Azure SQL DB, MI or VM?

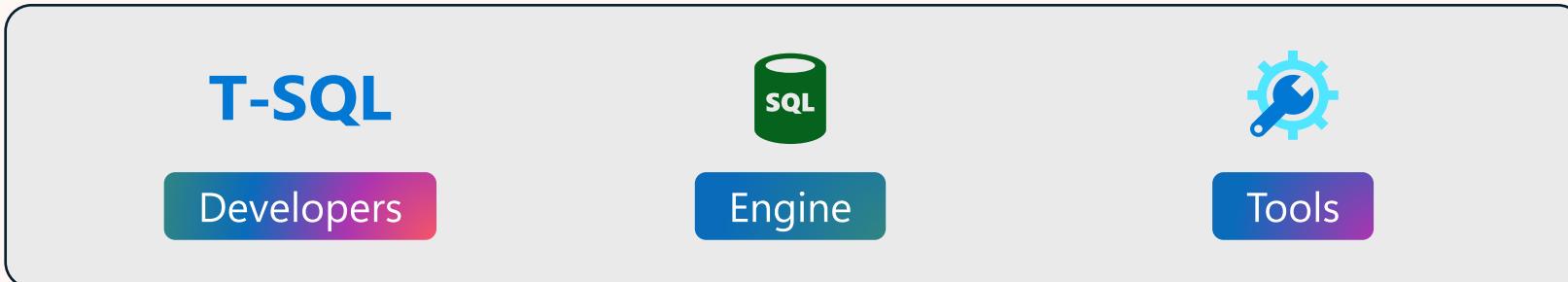
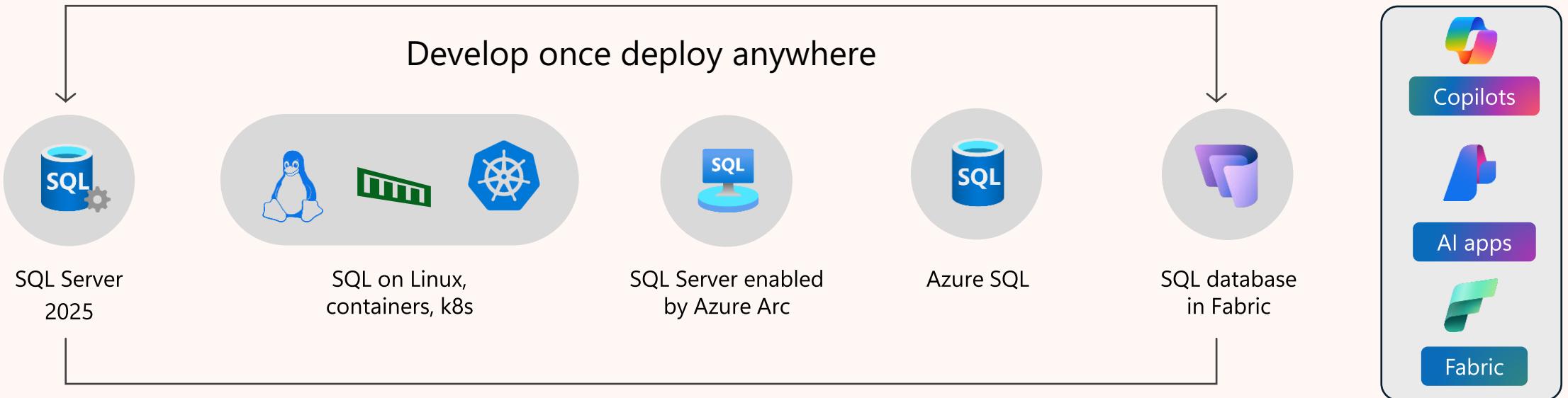
What about Microsoft Fabric (platform in general)?

What about SQL database in Fabric?



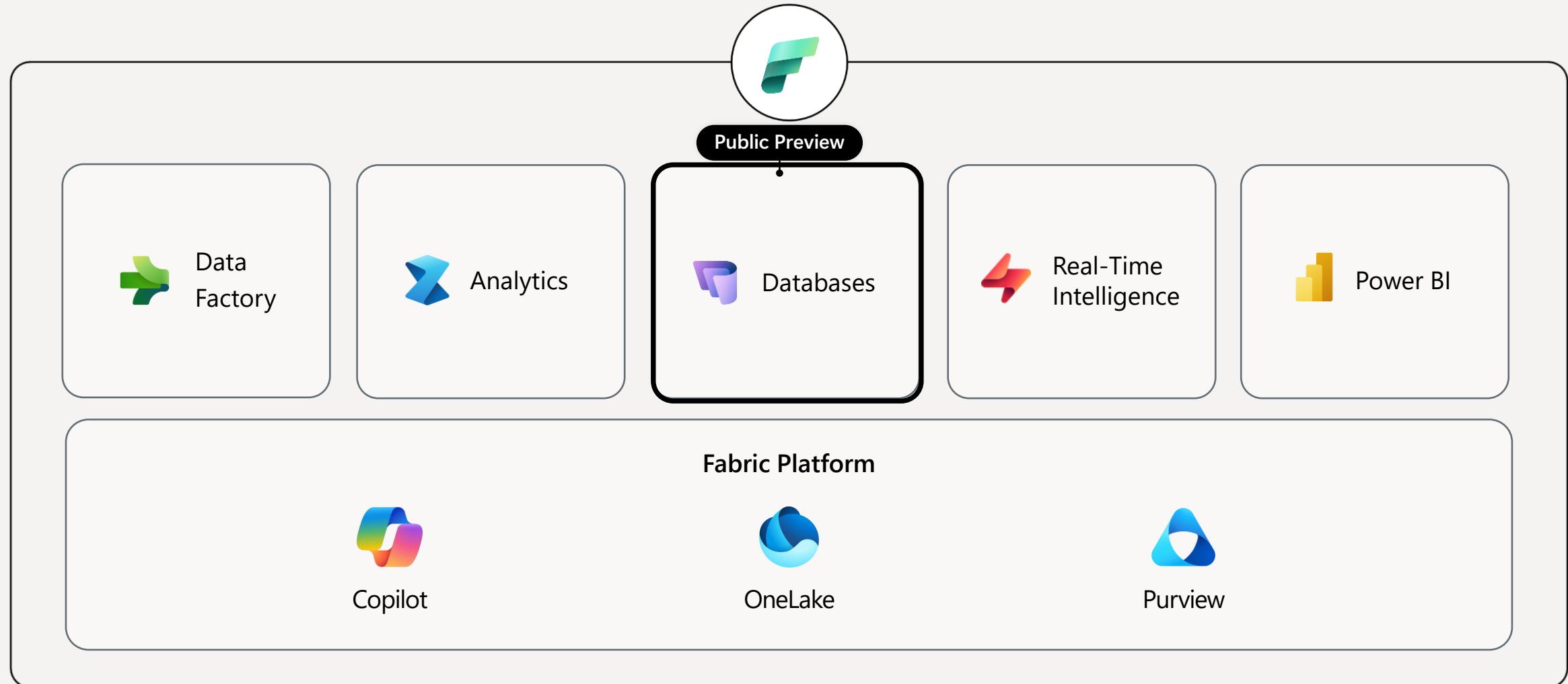
Microsoft SQL – ground to cloud to fabric

The next generation enterprise ready AI database



Microsoft Fabric

The unified data platform for AI transformation





Fabric Databases

Accelerate AI application innovation with a unified data platform



Simplified



Autonomous

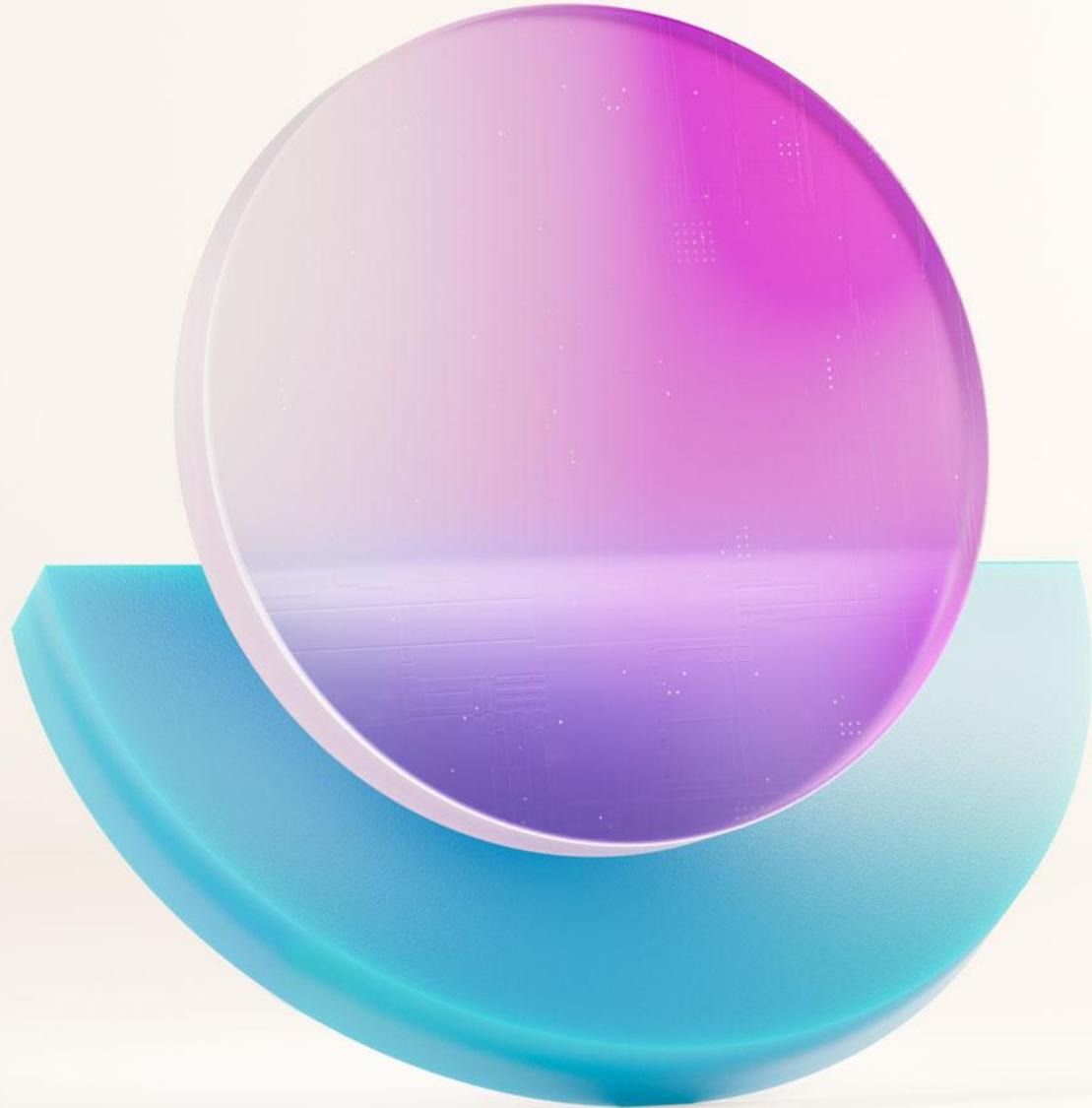


Optimized for AI

Built upon the familiar SQL Server/Azure SQL Database engine, in Microsoft Fabric



Microsoft Fabric
Community Conference



Simplified

Focus on building your app



Easy provisioning



AI assistance



Integrations from the editor



T-SQL support

The screenshot shows the Microsoft Fabric Data Explorer interface. At the top, there's a navigation bar with links for Home, Replication, Security, Get data, New Query, Templates, Open in, New API for GraphQL, Performance summary, and Copilot. Below the navigation bar is the Explorer sidebar, which lists databases (ContosoDB) and tables (dbo, AuditLogs, Billing, ChatSummary, CustomerActivity, Customers, Employee, Inventory, OrderDetails, Orders, Payments, Plans). The main area is titled "Data preview - Products" and displays a table with 185 rows of product data. The columns are: ProductID, ProductName, Description, Price, Category, StockQuantity, and CreatedDate. The table includes rows for various products like ScreenGuard Pro, CaseMate X, PowerBank Z, CarMount T, WirelessCharger S, BluetoothSpeaker R, SelfieStick V, PhoneStand A, MemoryCard M, Earbuds E, Stylus Pen, CleaningKit C, LensKit L, VRHeadset V, GameController G, SmartWatch S, FitnessBand F, and USBHub U. The interface also shows a status message at the bottom: "Succeeded (3 sec 17 ms)" and "Columns: 7 Rows: 185".

ProductID	ProductName	Description	Price	Category	StockQuantity	CreatedDate
1	ScreenGuard Pro	Tempered glass screen protection film	7.28	Accessory	79	2024-10-11T13:30:00Z
2	CaseMate X	Durable phone case with integrated kickstand	6.19	Accessory	8	2024-10-11T13:30:00Z
3	PowerBank Z	Portable power bank with fast charging	11.13	Accessory	28	2024-10-11T13:30:00Z
4	CarMount T	Car mount for phones and tablets	19.76	Accessory	80	2024-10-11T13:30:00Z
5	WirelessCharger S	Wireless charging pad for smartphones	12.73	Accessory	76	2024-10-11T13:30:00Z
6	BluetoothSpeaker R	Portable Bluetooth speaker with long battery life	44.51	Accessory	31	2024-10-11T13:30:00Z
7	SelfieStick V	Extendable selfie stick for vlogging	6.44	Accessory	25	2024-10-11T13:30:00Z
8	PhoneStand A	Adjustable phone stand for hands-free viewing	8.69	Accessory	32	2024-10-11T13:30:00Z
9	MemoryCard M	High-capacity memory card for cameras	45.53	Accessory	81	2024-10-11T13:30:00Z
10	Earbuds E	Wired in-ear earbuds with clear sound	6.36	Accessory	100	2024-10-11T13:30:00Z
11	Stylus Pen	Precision stylus pen for tablets	7.55	Accessory	52	2024-10-11T13:30:00Z
12	CleaningKit C	Phone cleaning kit with microfiber cloths	9.67	Accessory	15	2024-10-11T13:30:00Z
13	LensKit L	Clip-on camera lens for travel photography	31.75	Accessory	32	2024-10-11T13:30:00Z
14	VRHeadset V	Virtual reality headset for immersive gaming	50.49	Accessory	26	2024-10-11T13:30:00Z
15	GameController G	Bluetooth game controller for consoles	46.47	Accessory	24	2024-10-11T13:30:00Z
16	SmartWatch S	Smartwatch with fitness tracking	115.02	Accessory	96	2024-10-11T13:30:00Z
17	FitnessBand F	Fitness tracking band for activity monitoring	69.02	Accessory	53	2024-10-11T13:30:00Z
18	USBHub U	Multi-port USB hub for connectivity	23.89	Accessory	11	2024-10-11T13:30:00Z

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

The screenshot shows the Microsoft Fabric web interface with the following elements:

- Header:** View deployment pipeline, Create app, Manage access, Workspace settings.
- Top navigation:** Source control (8), Filter by keyword, Filter, More.
- Table:** A list of tasks with columns: Task, Owner, Refreshed, and New ref. Several rows are listed, mostly with Anna Ho... as the owner.
- Source control sidebar:** Current branch: planelanding, Changes (8), Updates.
- Changes list:** A list of database items with checkboxes:
 - Contoso PDFs RAG (checked, green)
 - RAG-with-resumes (unchecked, grey)
 - api1 (checked, green)
 - ContosoDB (checked, green)
 - dev (checked, green)
 - Notebook 1 (checked, green)
- Buttons:** Commit, Undo.

Replication to OneLake

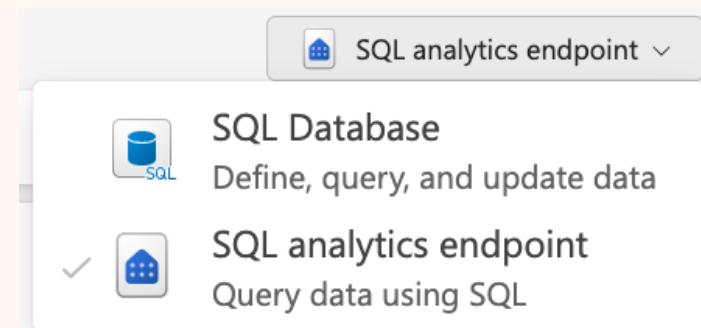
Near real-time replication to OneLake by default, seamless integrations with the rest of Fabric

Data stored in SQL database and replicated to open-source Delta format

Delta format copy in OneLake queryable via SQL analytics endpoint

Unified operational and analytics

Name	Type
ContosoDB	SQL database
ContosoDB	Semantic model (default)
ContosoDB	SQL analytics endpoint



SQL database in Fabric capacity model

Microsoft Fabric is a unified product for all your data workloads. Rather than provisioning and managing separate compute for each workload, the capacity is shared between all the workloads. 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.

Costs can be managed by pausing and resuming capacity

Purchased as a Pay-as-you-go resource (can apply Azure reservation)

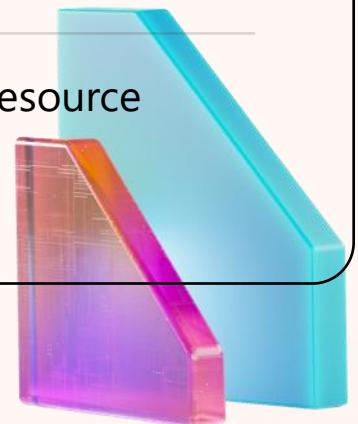


Storage

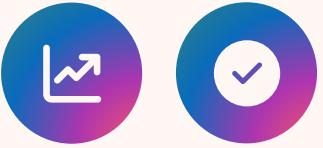
A single place to store all data.

It is tied to a capacity and continues to accrue when capacity is paused

Purchased as Pay-as-you-go resource (no Azure reservation)



Autonomous



Auto-High Availability with Zone Redundancy

Auto-scaling compute and storage

Auto-replicated to OneLake (no ETL)

Auto-indexing

Latest Intelligent Query Processing enhancements

Auto-backups, point-in-time restore available

Auto-patching



Secure and governed by default

Authentication

Microsoft Entra authentication **only**

- Central identity management

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 and in transit

Customer Managed Key support

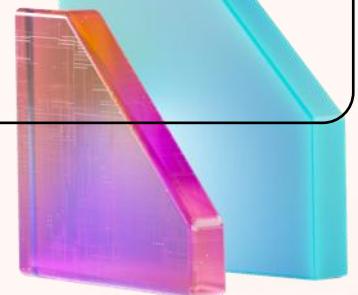
*Auditing

Enabled by default and customizable

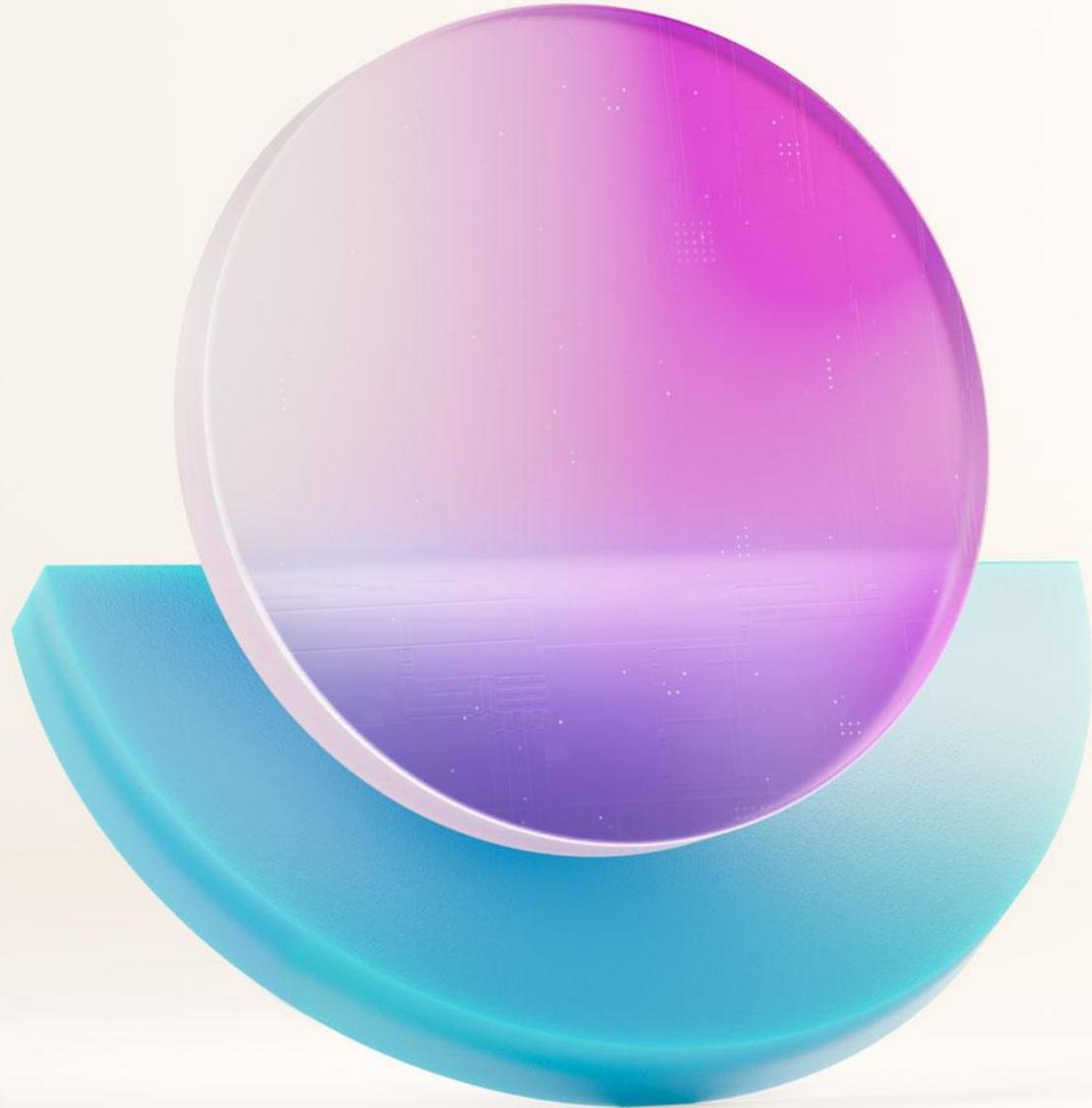
Central governance

Microsoft Purview sensitivity labels

Centrally-managed protection policies



Microsoft Fabric
Community Conference



Optimized for AI

Build new AI apps with SQL database in Fabric



Vector and RAG support



Call models with REST support



Integration with Azure AI services and Azure AI Foundry



Integration with popular frameworks, like LangChain and Semantic Kernel



Fabric simplifies AI projects

SQL database has seamless integration with Fabric so you can unlock insights and actions

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

The collage consists of four rounded rectangular windows:

- Power BI Direct Lake mode:** A screenshot of a Power BI dashboard showing various charts and data visualizations, including a line chart for 'ModifiedDate' and a bar chart for 'Count of ViewCustomerOrders by order_status'.
- Cross-database querying with multi-cloud shortcuts:** A screenshot of a SQL query editor titled 'new visual query' showing a complex multi-database query across multiple databases and tables.
- Data Science experiences with notebooks:** A screenshot of a Jupyter Notebook interface titled 'PySpark (Python)' showing a code cell with a spark SQL command and its execution results.
- Data activator and Real-Time Intelligence:** A screenshot of a data preview window showing a table of customer data with columns like C_CUSTKEY, C_NAME, and C_ACCTBAL, along with a 3D bar chart visualization at the bottom.

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.



Use cases and scenarios

Citizen no-code developer

Event-driven apps

LOB Power apps with SQL in Fabric

Metadata driven framework

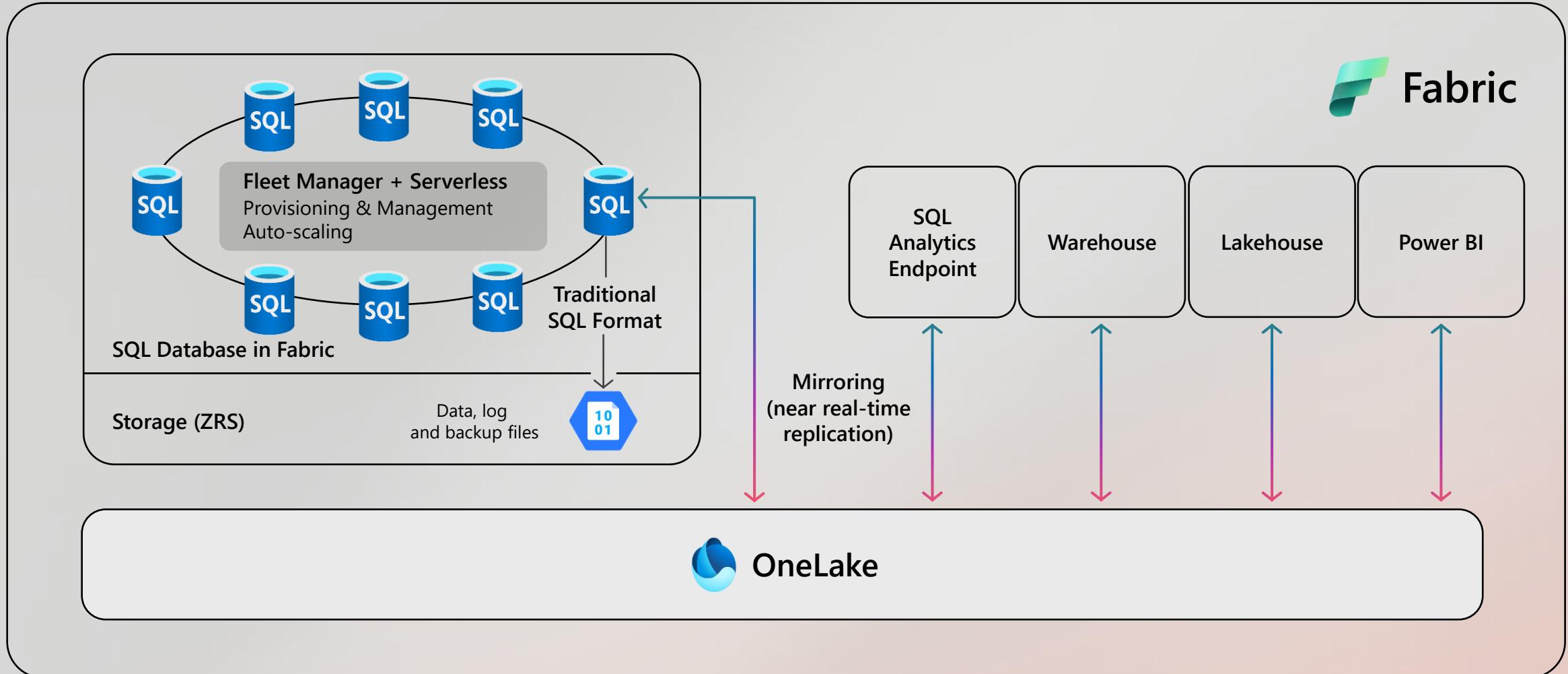
Reverse ETL

Operational data store (ODS)

Power BI writebacks

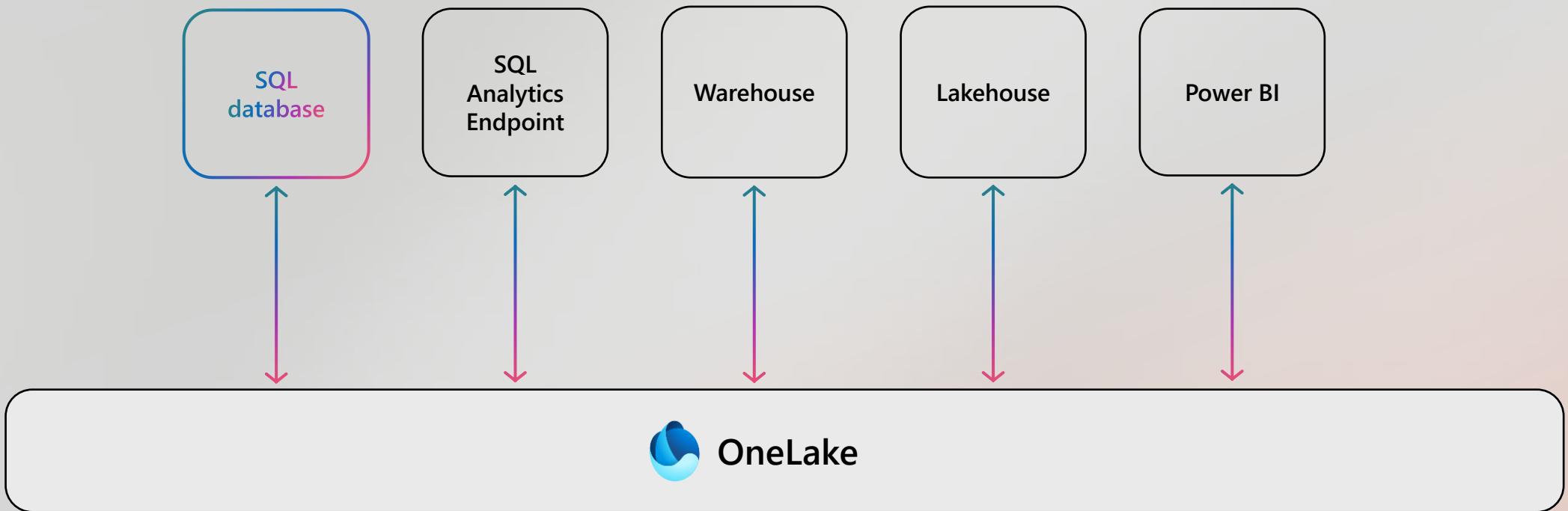
Reference data store

Architecture



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

Architecture

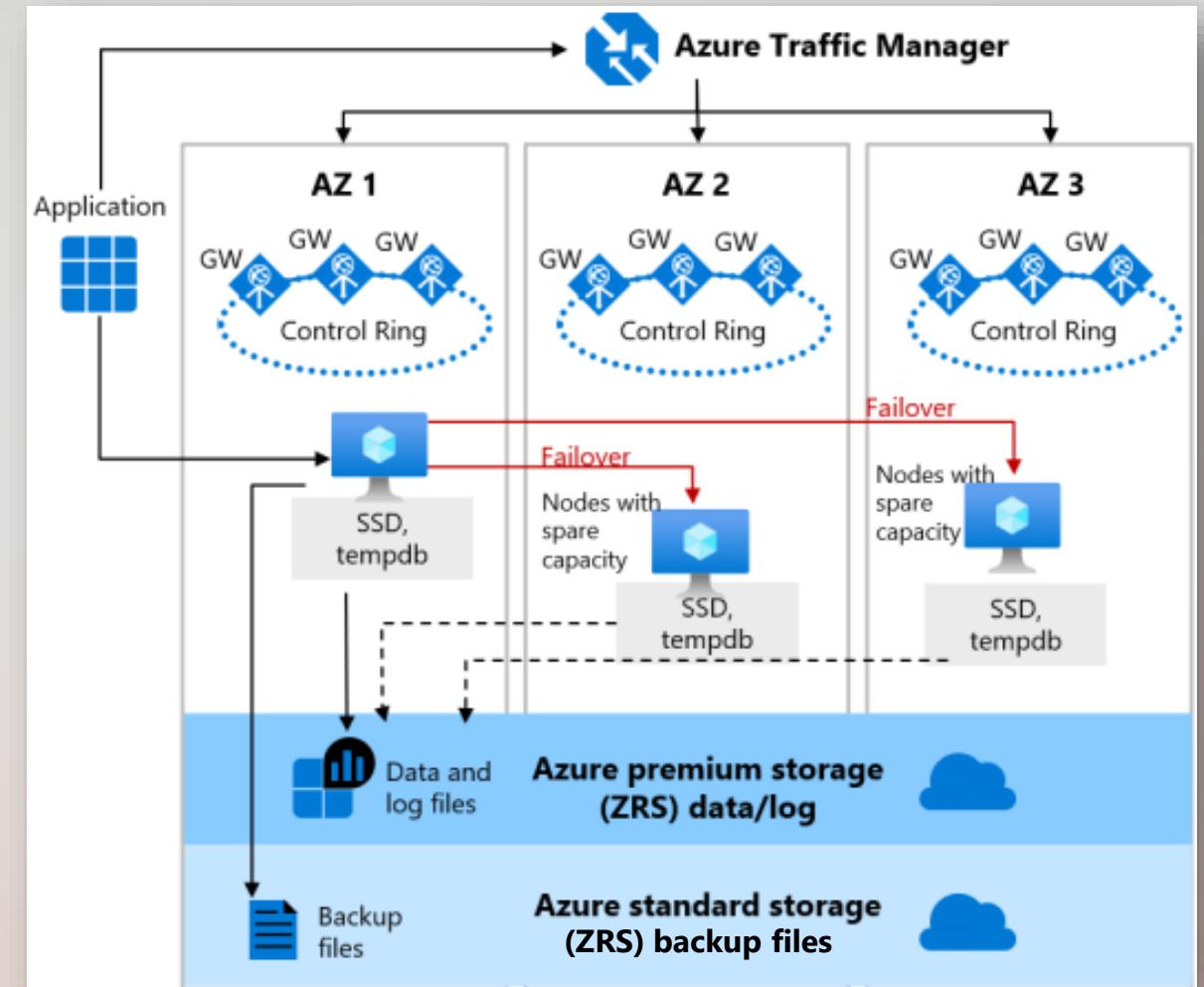


The power of Fabric with no compromises on your SQL operational database

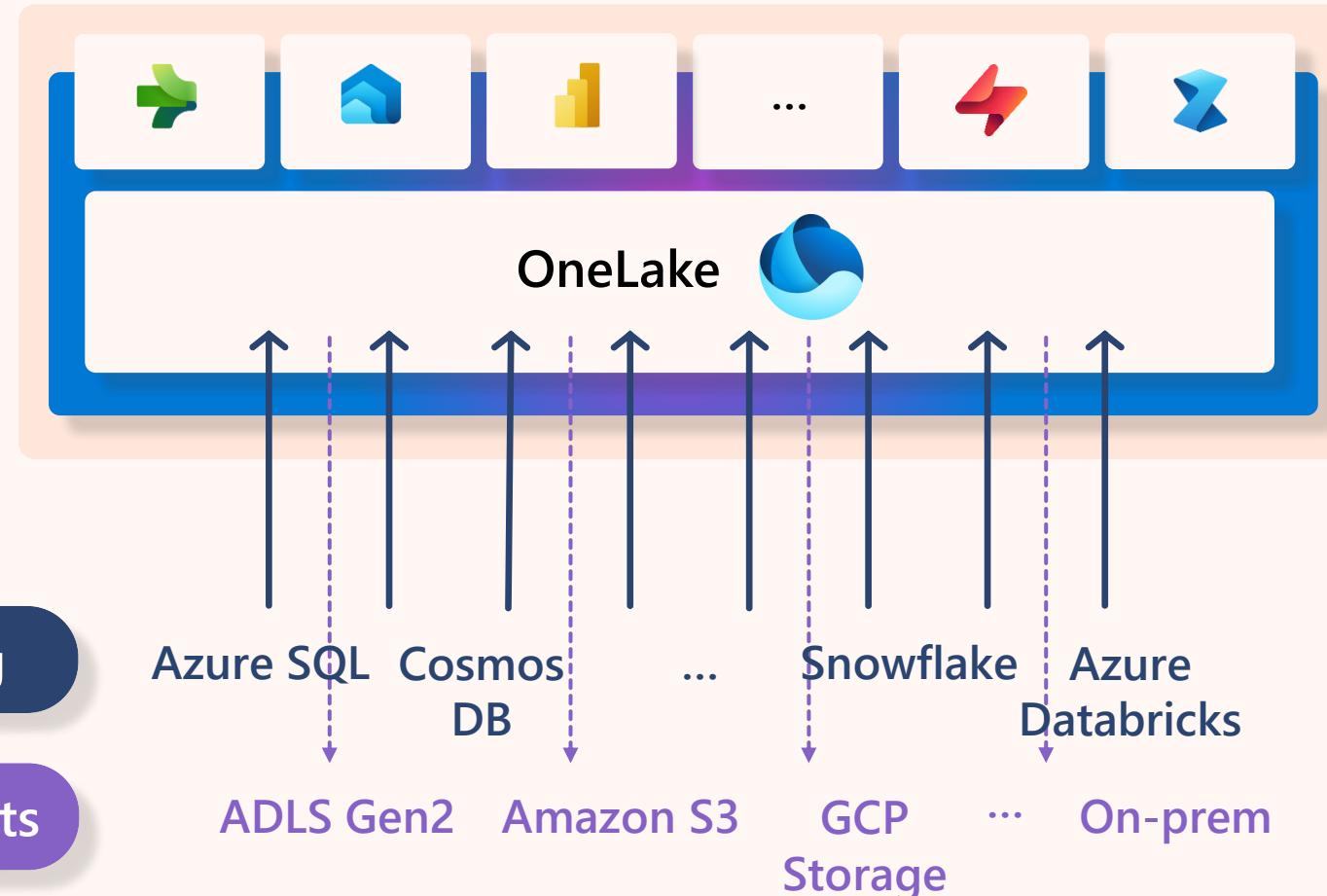
SQL database in Microsoft Fabric



- Built-in high availability (zone redundancy).
- Stateless compute
- Failover decisions based on SQL and Azure Service Fabric
- Low recovery time
- Connectivity redirection built-in
- Remote storage provides data and backup files redundancy across data centers



Fabric Mirroring



Fabric Mirroring | Why?

Mixed workload challenges

Running **both OLTP and analytics** workloads on top of the same database is challenging.

Two workload types need different indexes, data organization, perf optimizations.

Existing solutions & workarounds

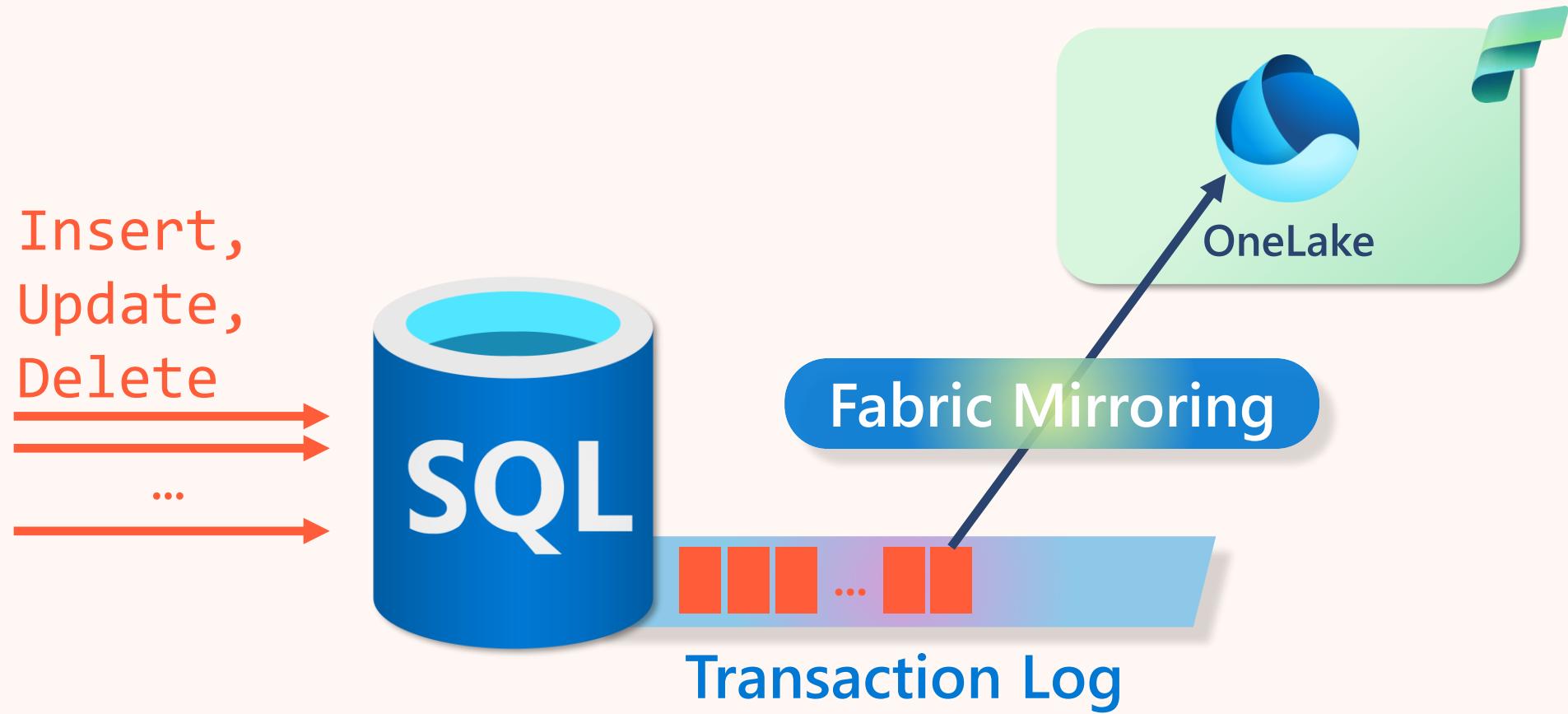
- ETL
- Change Data Capture
- Change Tracking
- Transactional Replication
- Availability Groups
- Failover Groups

Data integration

For various reasons and use cases, data from different sources and systems needs to be in the same report, warehouse or system.

Fabric and mirroring are **designed for data integration**.

Fabric Mirroring



Lab scenario, problem statement

Adventure Outdoors experiencing lower sales due to customer service issues and unable to find the right products to serve customer needs.

Chief Revenue and Customer officers would like to improve customer experience, support and increase sales by leveraging gen AI capabilities, real-time operational data analysis, and quickly respond to customer requests

The innovation, customer experience and IT team are in charge to make this change

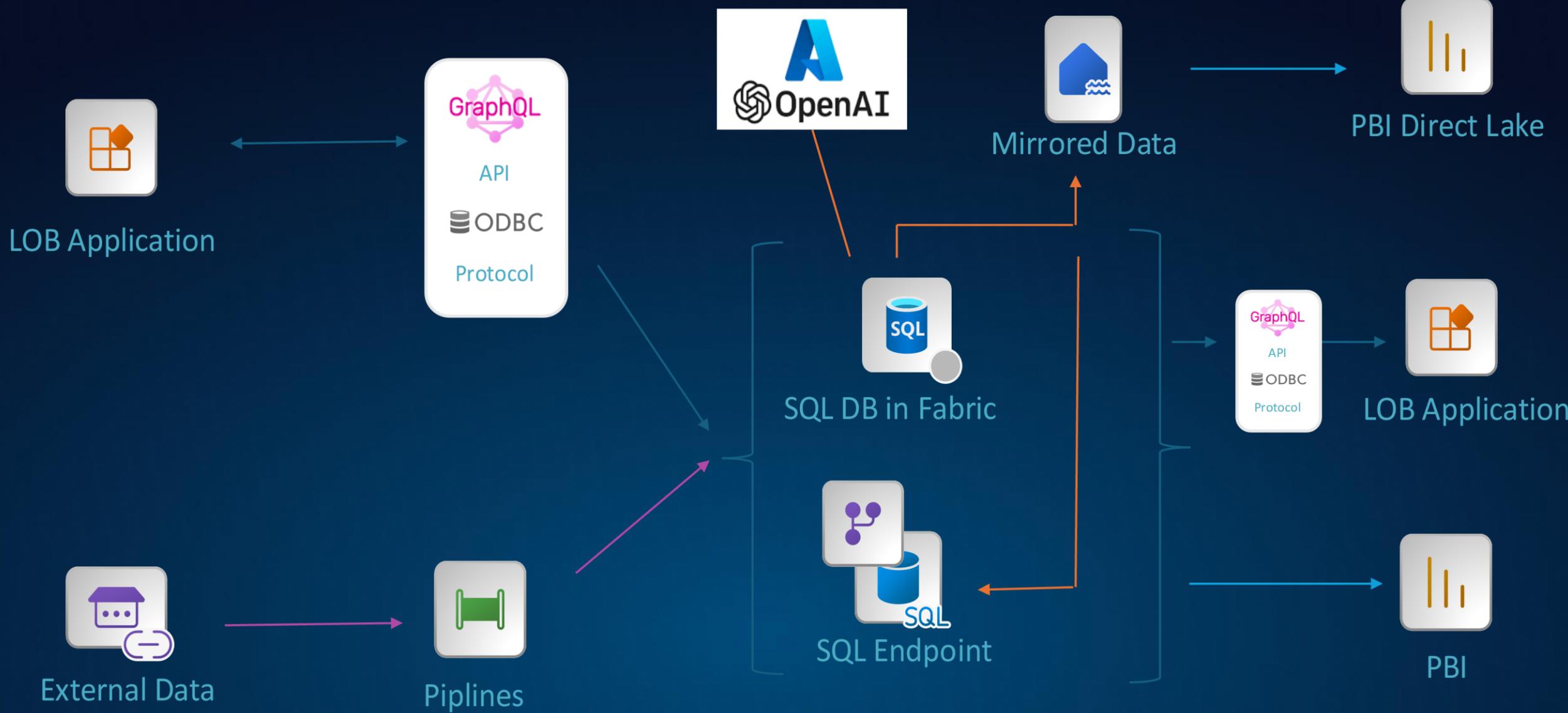
DATA SOURCE

INGESTION

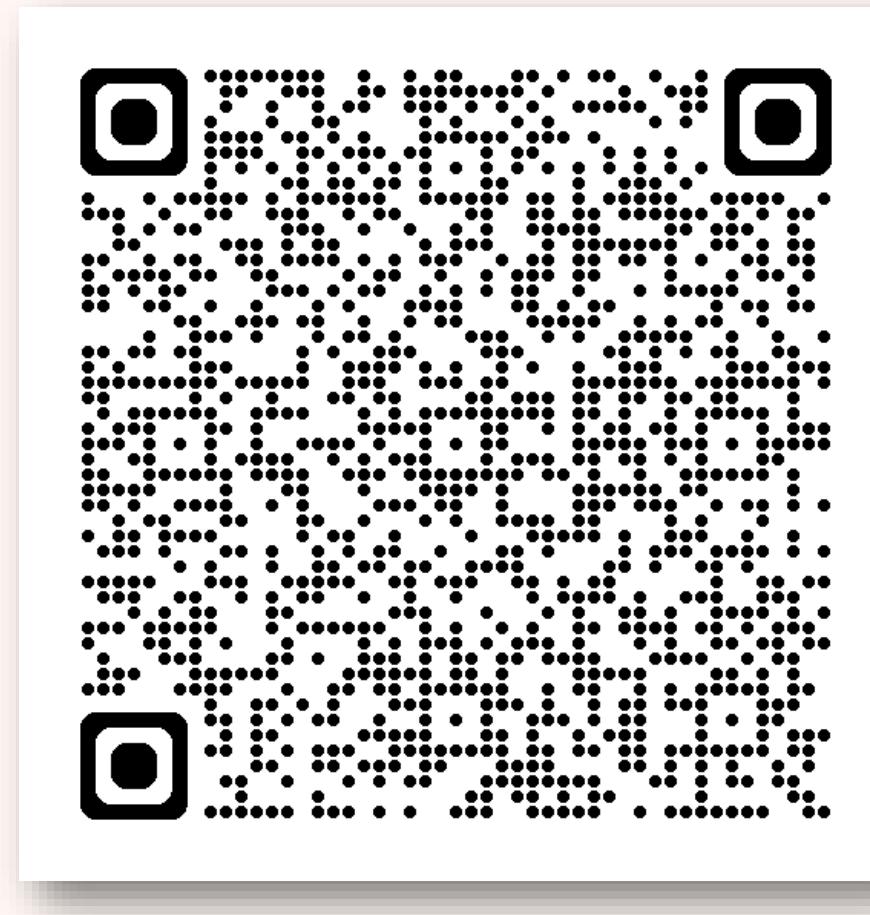
AI

STORE

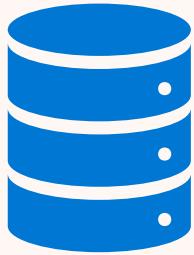
EXPOSE



<https://aka.ms/FabConSQLDB>



Modules 1 & 2: Intro to SQL database in Fabric



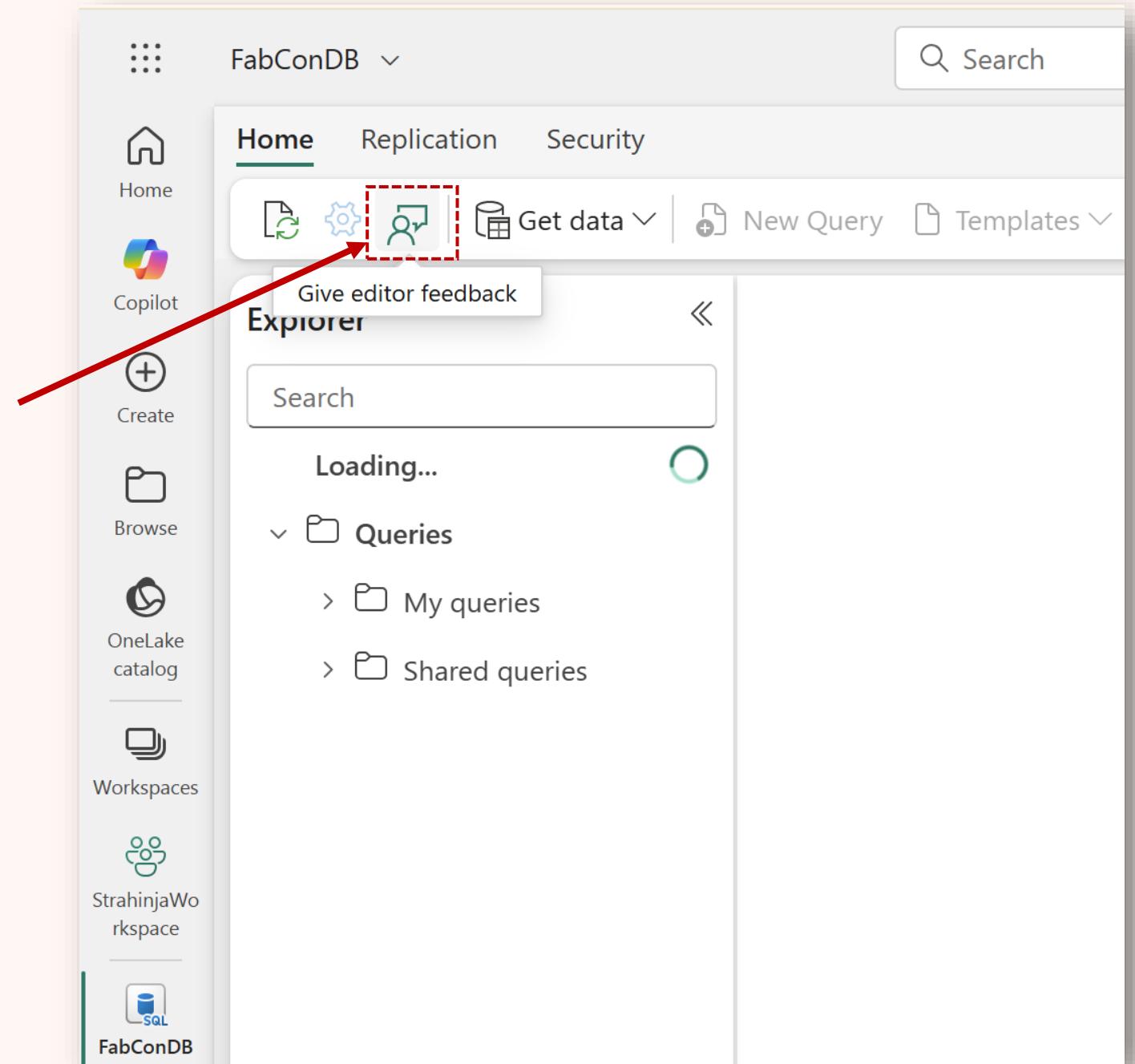
Learning Goal

Getting familiar with and comfortable operating SQL database in Microsoft Fabric

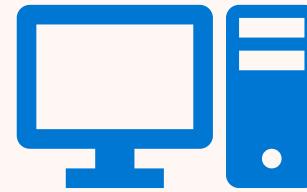
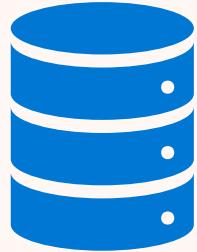
What will you do?

- Learn the basics of SQL database in Fabric
- Load sample data, query and examine data
- View auto-replicated data
- Query SQL analytics endpoint

Feedback button



Module 3: Use Copilot with SQL database



Learning Goal

Learn how to leverage Copilot to enhance your query - writing experience and gaining data insights within the query editor.

Learn how to use built-in AI capability to understand and maintain an existing queries or create new queries.

What will you do?

Use Copilot **Inline Code completion** to write SQL code faster and easier

Use Copilot **Quick Action** to fix your query error

Use Copilot **Chat Pane** to generate and execute SQL code from natural language

Copilot and Azure OpenAI Service

- Users can use Copilot and other features powered by Azure OpenAI

Enabled for the entire organization

When this setting is enabled, users can access the features powered by Azure OpenAI, including Copilot. This setting can be managed at both the tenant and the capacity levels. [Learn More](#)

For customers in the EU Data Boundary, this setting adheres to Microsoft Fabric's EU Data Boundary commitments. [Learn More](#)

By enabling this setting, you agree to the [Preview Terms](#).



Enabled

⚠️ Note: Copilot in Fabric is now generally available, starting with the Microsoft Power BI experience. The Copilot in Fabric experiences for Data Factory, Data Engineering, Data Science, Data Warehouse, and Real-Time Intelligence are in preview.

⚠️ Note: If Azure OpenAI is not available in your geographic region, your data may need to be processed outside your capacity's geographic region, compliance boundary, or national cloud instance. To allow data to be processed outside your capacity's geographic region, turn on the related setting, "Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance".

Apply to:

The entire organization

Specific security groups

Except specific security groups

Delegate setting to other admins

Select the admins who can view and change this setting, including any security group selections you've made.

Capacity admins can enable/disable

Apply

Cancel

If you use your own Tenant

- Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance

Enabled for the entire organization

This setting is only applicable for customers who want to use Copilot and AI features in Fabric powered by Azure OpenAI, and whose capacity's geographic region is outside of EU Data Boundary and US. [Learn More](#)

When this setting is enabled, data sent to Azure OpenAI can be processed outside your capacity's geographic boundary or national cloud boundary. This setting can be managed at both the tenant and the capacity levels. [Learn More](#)

By enabling this setting, you agree to the [Preview Terms](#).



Enabled

⚠️ Note: Even if this setting is on, you will also need to turn on the related setting "Users can use a preview of Copilot and other features powered by Azure OpenAI" for these features to work.

Apply to:

The entire organization

Specific security groups

Except specific security groups

Delegate setting to other admins

Select the admins who can view and change this setting, including any security group selections you've made.

Capacity admins can enable/disable

Apply

Cancel

Give Feedback on Copilot's Response

The screenshot shows the Microsoft Fabric Copilot interface. On the left, there is a card titled "7. Other Data Types" with sections for "Additional Information" and "References". A red box highlights the "Like" button and thumbs-up/thumbs-down icons. On the right, a "Submit feedback to Microsoft" modal is open, prompting the user to "What did you like?" with a text area and a note about privacy. The modal has "Submit" and "Cancel" buttons.

Copilot Preview

7. Other Data Types

- cursor
- geography
- geometry

Additional Information

- SQL Server provides a set of system data types that define all the types of data that can be used.
- You can also define your own data types in Transact-SQL or the Microsoft .NET Framework.

For more specific information on data types in Microsoft Fabric, you can refer to the official documentation.

References

- [Data types \(Transact-SQL\)](#)

Is this response helpful?

Ask me anything about this database, or tell me how I can help.

0 / 500

Submit feedback to Microsoft

What did you like?

Give as much detail as you can, but do not include any private or sensitive information.

When you select Submit, your feedback will be used to improve Microsoft products and services. IT admins for your organization will be able to view and manage your feedback data.

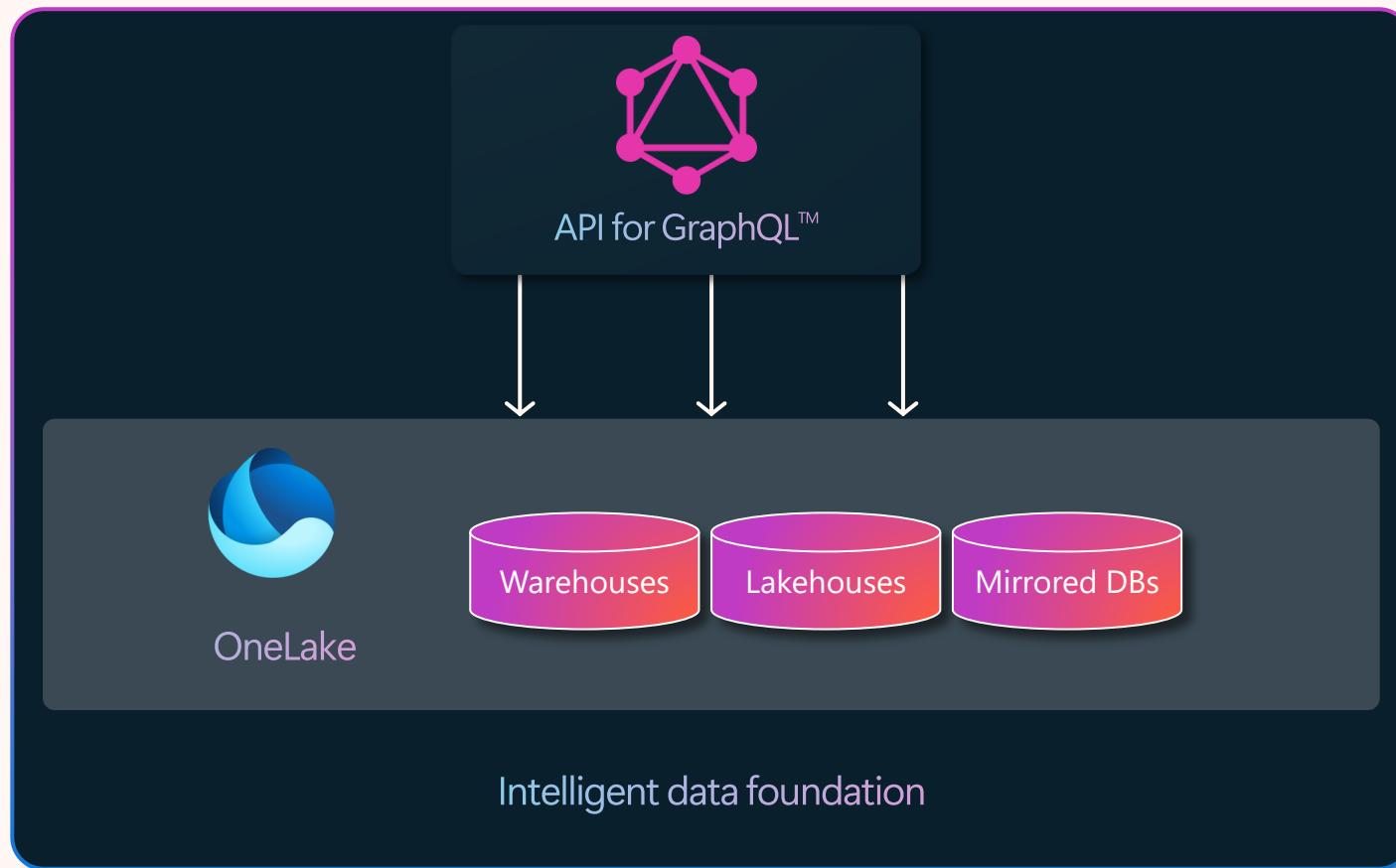
Privacy Statement

Submit Cancel

+ New

API for GraphQL in Fabric

“The API for Accessing Fabric Data”



Consistent semantic layer API schema
abstracts database complexity

Single intelligent endpoint for all data

Flexible response structure for fine-
grained data retrieval

Simple, fast SaaS-ified experience

Fabric native: security, governance,
capacity consumption

API for GraphQL in Microsoft Fabric

- GraphQL is a query language for APIs and a runtime for executing those queries using a type system you define.
- At its core, it's about asking for exactly the data you need.

Benefits:

- Get exactly the data you need in a single request
- The client shapes the response, not the server.
- Bridges the gap between complex backends (SQL, microservices, warehouses) and flexible frontends.



GraphQL Basics



Schema



Types/
Fields



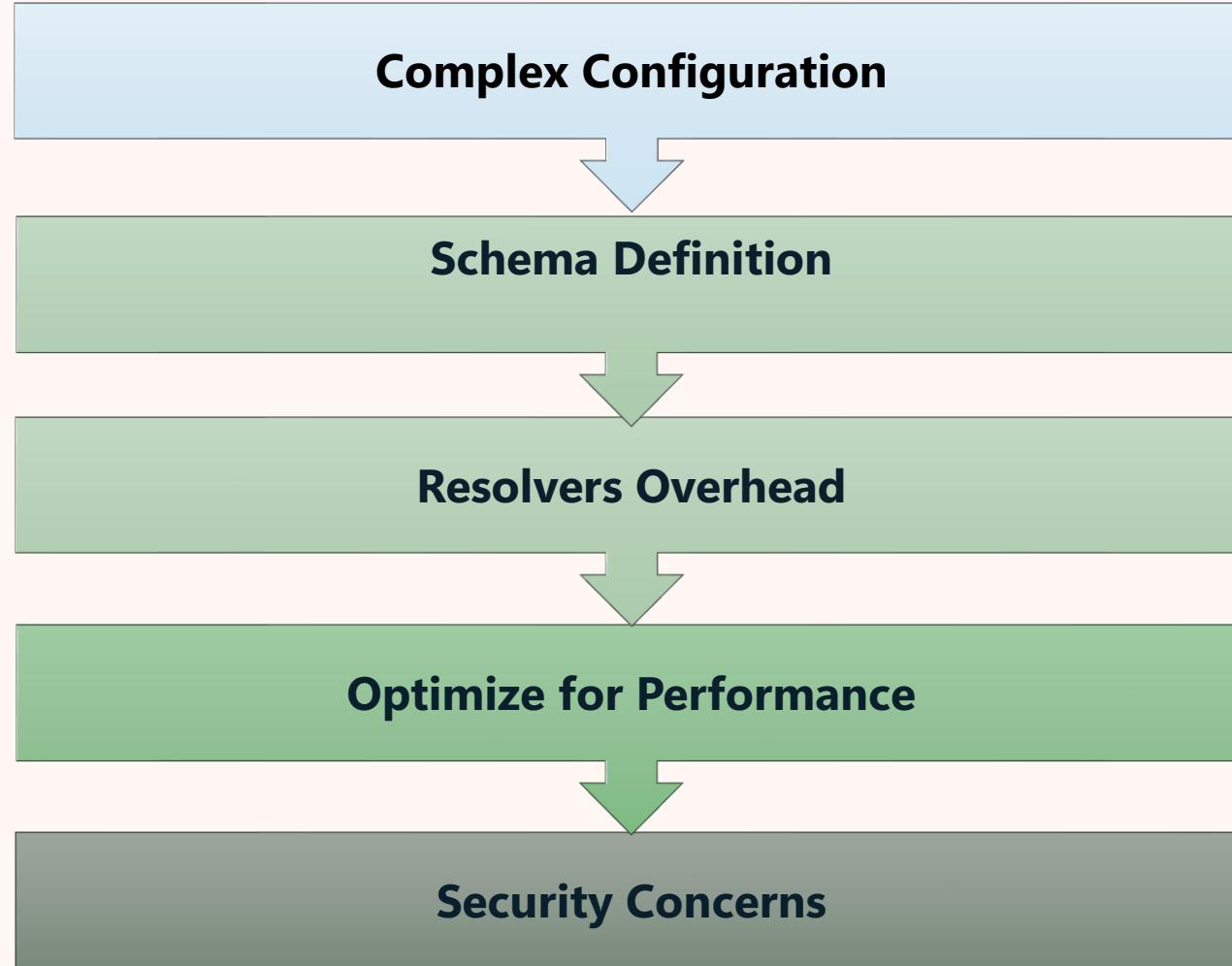
Queries,
Mutations



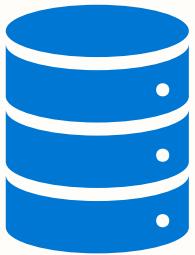
Relationships



Typical Setup of a GraphQL Server



Module 4: Exploring GraphQL



Learning Goal

Understand the basics of GraphQL API and how to connect it with the SQL DB in Fabric.

What will you do?

Create a GraphQL API.
Expose your data through GraphQL API Endpoint to your web application

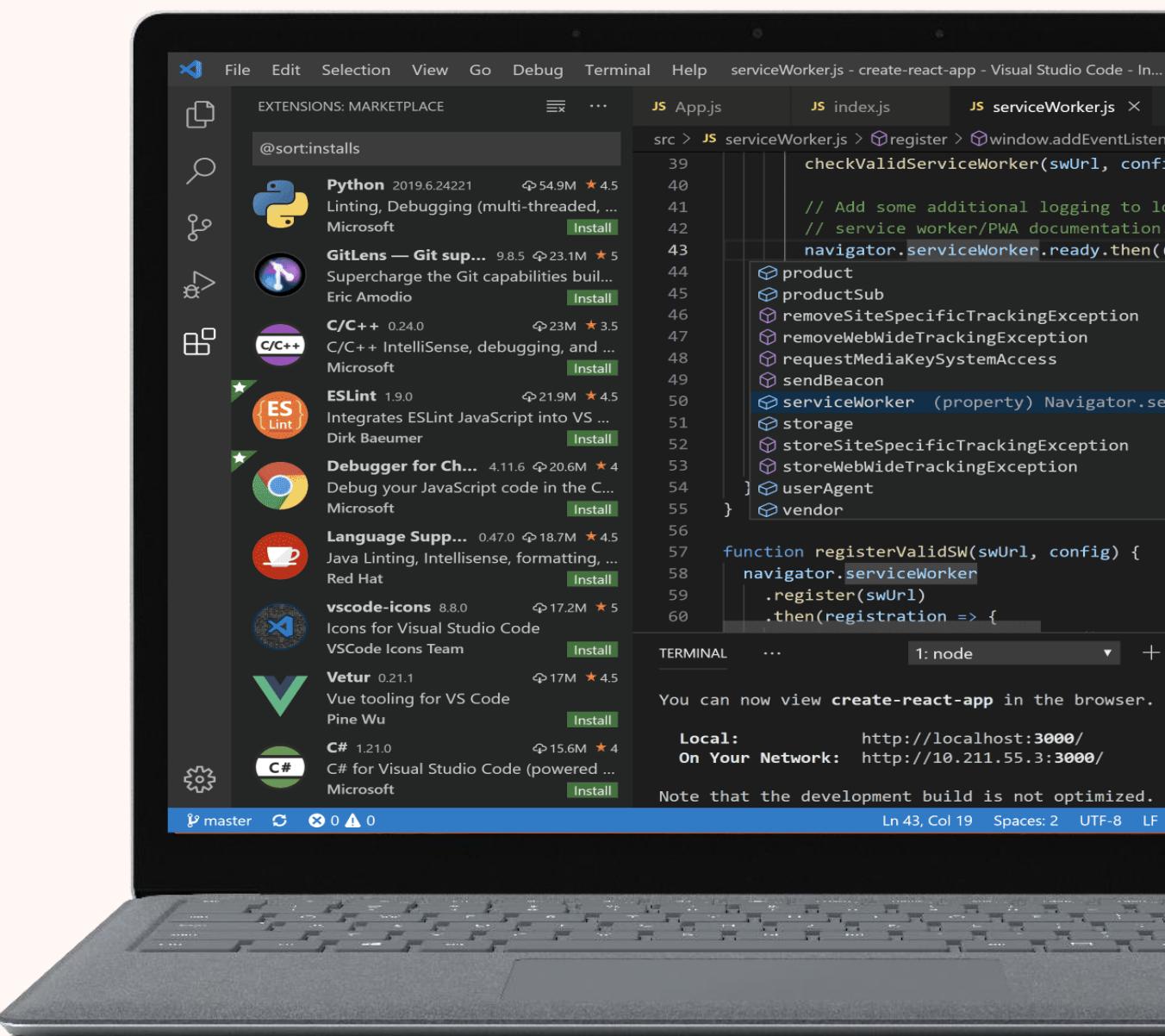
COFFEE BREAK (10:30 – 11:00)

Visual Studio Code

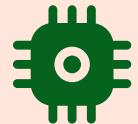
Loved by developers across communities
Most popular development environment - [2025 StackOverflow Survey](#)

Developed in an open ecosystem:

- 32,000+ extensions, community-built
- Daily insider releases
- [Public roadmap](#), [issues](#), and backlog



MSSQL extension for VS Code



Multi-platform



Local + Cloud
Dev Ready



Modern
UI



Built-in
Tools

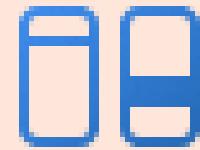


Dev-first
experience



Copilot
Integration

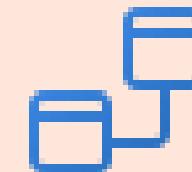
Schema Management



Compare
schemas



Visual
designer



Manage
relationships



Code generation



One-click
updates



No T-SQL
required

GitHub Copilot integration



Schema aware
interactions



Inline & chat
suggestions



Agent mode
tools



Code generation



Natural language
prompts

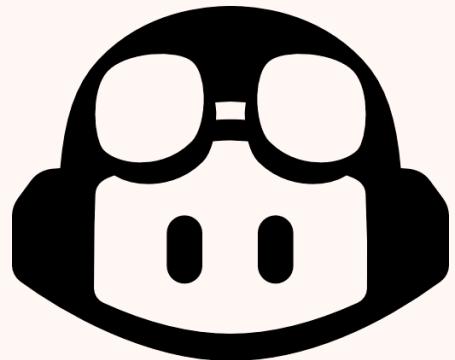


Private & permission-
aware

“

Imagine having an AI-powered co-developer right inside your MSSQL extension for Visual Studio Code, one that not only deeply understands SQL and best practices for data-driven development, but also helps you build full-stack applications from the ground up.

”



+



Simple Browser X

← → ⌂ http://localhost:3000

08 11 12 13

14 15 16 17

Conference Sessions

Discover upcoming sessions and speakers at our conference

7

Total Sessions

5

Scheduled

2

TBA

5

Tracks



Keynote: Shipping AI Safely

Ada Lovelace

Monday, October 20

3:00 AM–3:45 AM

Auditorium A

• AI & Data



Modern Data Workflows in Fabric

Grace Hopper

To Be Announced



Building Scalable ML Pipelines

Alan Turing

Monday, October 20

4:15 AM–5:00 AM

Conference Room B

• Engineering



Data Visualization Best Practices

Katherine Johnson

Monday, October 20

8:00 AM–8:45 AM

Workshop Room C

• Analytics



Building Scalable APIs with GraphQL

Katherine Johnson

Monday, October 20

2:00 AM–2:45 AM

Conference Room B

• Development



The Future of Cloud Computing

Margaret Hamilton

Tuesday, October 21

10:30 AM–11:15 AM

Tech Hub

• Infrastructure



Machine Learning Ethics Workshop

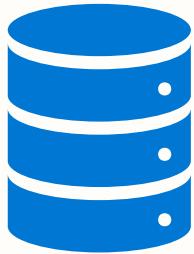
Hedy Lamarr

To Be Announced

Please reopen the preview.

Focus Lock

Module 5: RAG Implementation with Azure OpenAI



Learning Goal

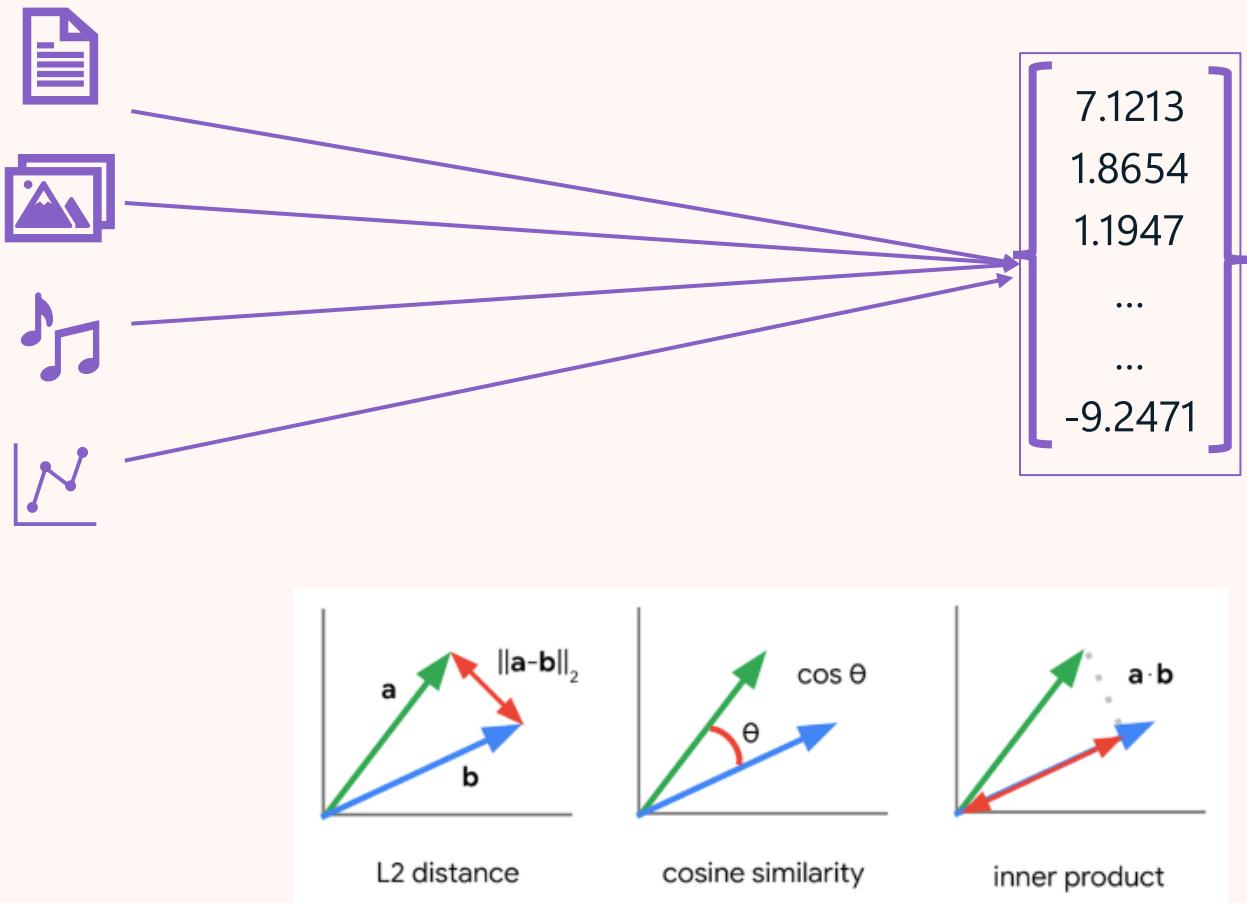
Gain knowledge on Large Language Models (LLM's)
Implement a Retrieval-Augmented Generation (RAG)
system
Integration with Azure Open AI services



What will you do?

AI-Powered Recommendations with Vector
Search
AI-Powered Natural Language result
processing

Vectors (embeddings)



Vector representations (**embeddings**)

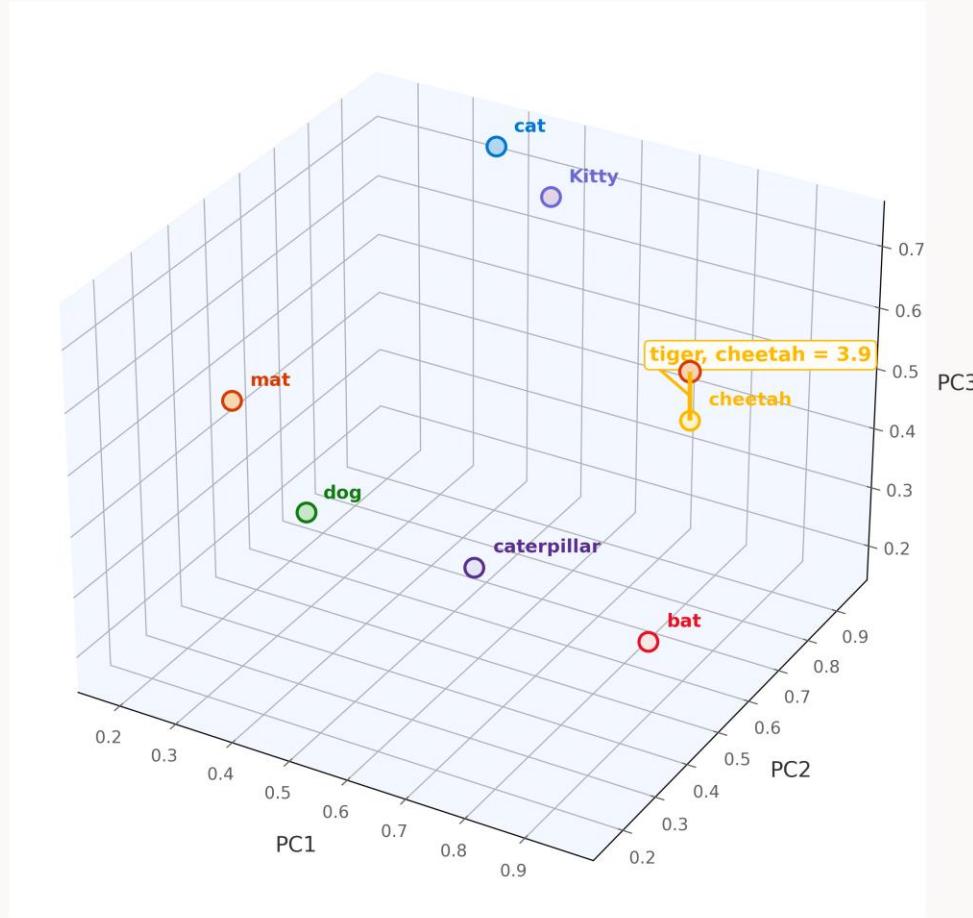
- Pre-trained AI Embedding Models that encode item -> vector embedding
- Similar items map to close vectors
- Sentences, images, graphs, etc.

Vector search

- Find K closest vectors given a “query” vector (embedding comparison: L2 distance, Inner Product, COS similarity)
- Search exhaustively (**KNN**) or through approximations (**ANN**)

Vector Search

Cosine Angle: tiger vs closest word (compact label)

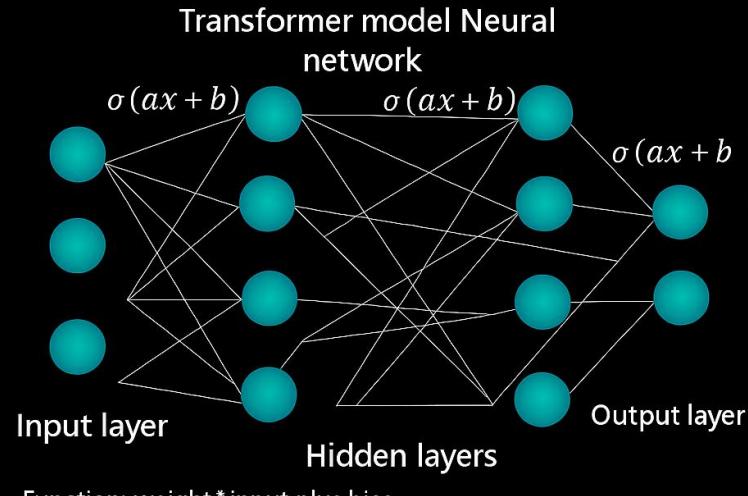


- Cosine similarity is the cosine of the angle between two vectors.
- Smaller angle → higher similarity (e.g., "tiger" and "cheetah").
- Nearby words like "cat" and "dog" share similar contexts.
- Distant words like "mat" or "bat" have lower similarity.

Large Language Models(LLMs)

- Large Language Models (LLMs) are AI systems,
- Based on transformer architectures
- Trained on vast amounts of text data to understand and generate human-like text
- Typically, multiple billions of parameters in size, making them five to ten times larger than small language models (SLMs)

How large ar they?



BERT Large – 2018
345 M

GPT2 – 2019
1,5B

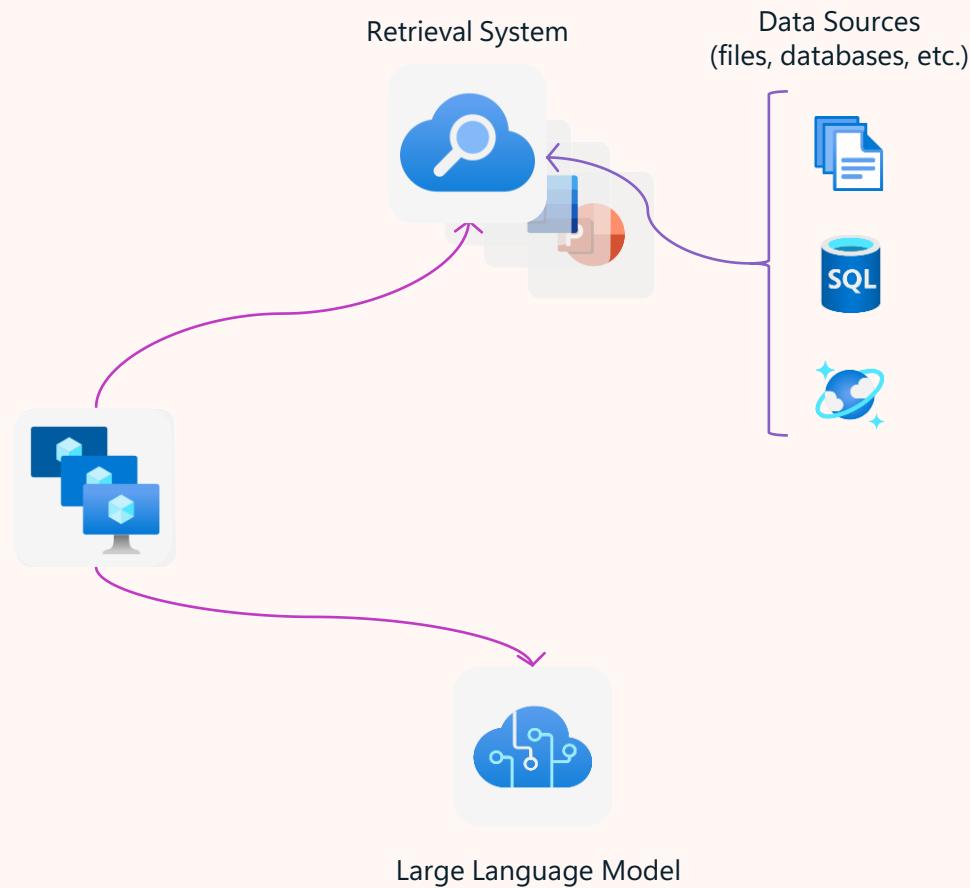
GPT3 – 2020
175B

Turing Megatron NLG
2021
530B

GPT-4,5 - 2024
-1,8T

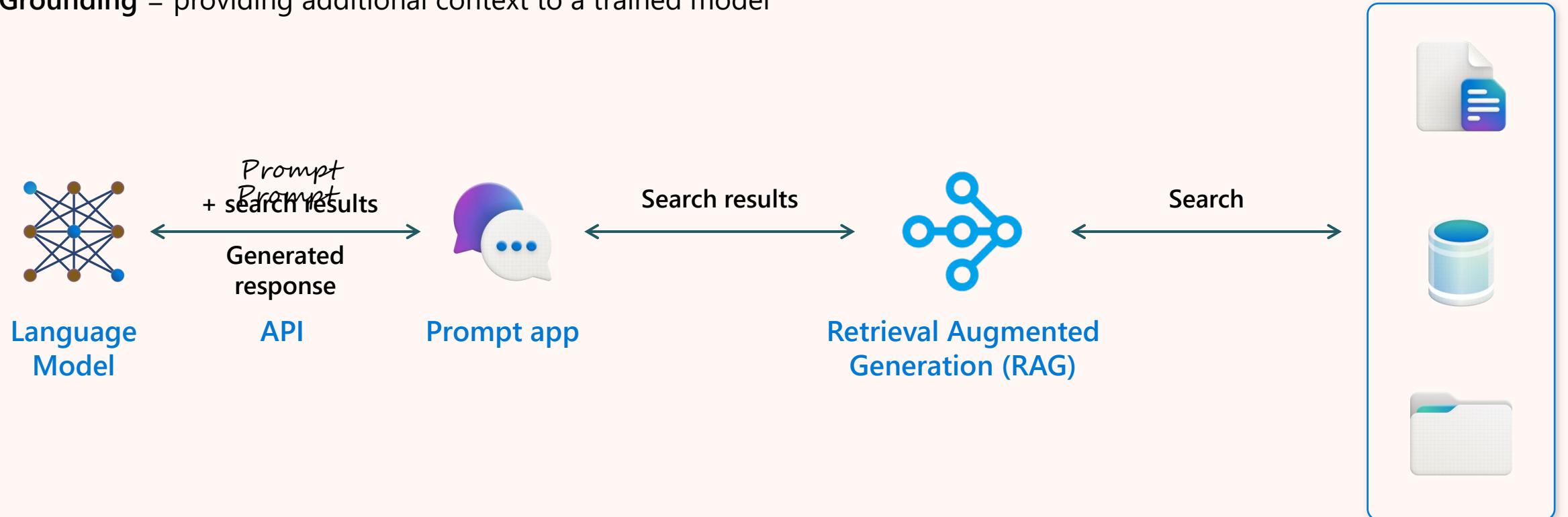
RAG – Retrieval Augmented Generation

RAG - intelligently retrieves a subset of data from data stores to provide specific, contextual knowledge to the large language model to support how it answers a user's prompt



Let's get grounded on prompts

Grounding = providing additional context to a trained model



Prompt Engineering

Better prompt = better responses

T-SQL Enhancements

Use **sp_invoke_external_rest_endpoint**

Allows calls to any HTTP REST endpoint

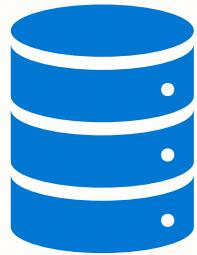
Use it to invoke the model (GPT 4.1)

Vector_distance

Calculates the distance between two vectors using a specified distance metric.

- cosine - Cosine distance
- euclidean - Euclidean distance
- dot - (Negative) Dot product

Module 6: Using PowerBI to visualize data



Learning Goal

How to leverage Power BI and SQL database in Fabric

Build a new report with CoPilot

What will you do?

User Power BI web version to connect with SQL database

Use SQL database in Fabric's analytics endpoint and PowerBI semantic models

Create Power BI report and visualize data

LUNCH BREAK (12:45 – 14:00)

Translytical task flows

Bridging the gap between data and decisions

The screenshot shows a Power BI report interface. At the top, there are four summary cards: 'Revenue Won' (\$4,018,430), 'Revenue in Pipeline' (\$3,023,244), 'Revenue Lost' (\$118,129), and 'Opportunities Closed' (86%). Below these are three filter panels: 'RISK' (Low risk, Medium risk, High risk), 'CLOSING-(DAYS)' (60, 70, 80, 90), and 'QUANTITY' (1, 2, 3, 4, 5). The main content area displays a table of opportunities with columns: OPPID, Submitted, QTY, REVENUE, DISCOUNT, STATUS, RISK, and DAYS. The table lists 15 opportunities from 2023, all marked as 'Open' and 'High risk'. A total of 126 opportunities have a total revenue of \$2,377,242 and 0% discount. To the right of the report is a dark blue callout box containing a 'Translytical task flows' task flow titled 'APPLY DISCOUNT TO OPPORTUNITIES'.

Translytical task flows

APPLY DISCOUNT TO OPPORTUNITIES

Step 1
Filter the characteristics of the opportunities from the filter section to which you want to apply a new discount.

Step 2
Enter the new assigned discount.

Numbers only (0-50)

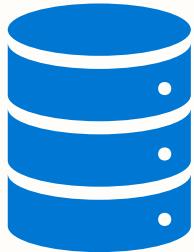
Submit discount

Public Preview

Translytical task flows marks a major evolution in Power BI reports, enabling automated action and data writeback directly within the report—streamlining decision-making and operational follow-through.

Powered by Fabric User data functions, this new capability allows users to automate tasks such as updating records, dynamic notifications, and even triggering workflows across other systems.

Module 7: Semantic Analysis with Power BI Translytical taskflow



Learning Goal

How to leverage Power BI and SQL database in Fabric

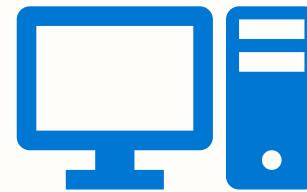
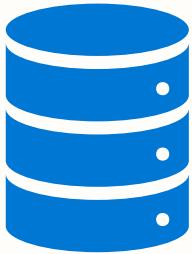
Writeback data from Power BI into SQL database in Fabric

What will you do?

User Power BI Desktop and configure settings

Create Power BI report, SQL objects and writeback inneractions

Module 8: Application Lifecycle management



Learning Goal

How to setup source control integration with Fabric workspace

How

What will you do?

Connect Fabric workspace to GitHub

Deploy schema changes in SQL database in fabric to git repo

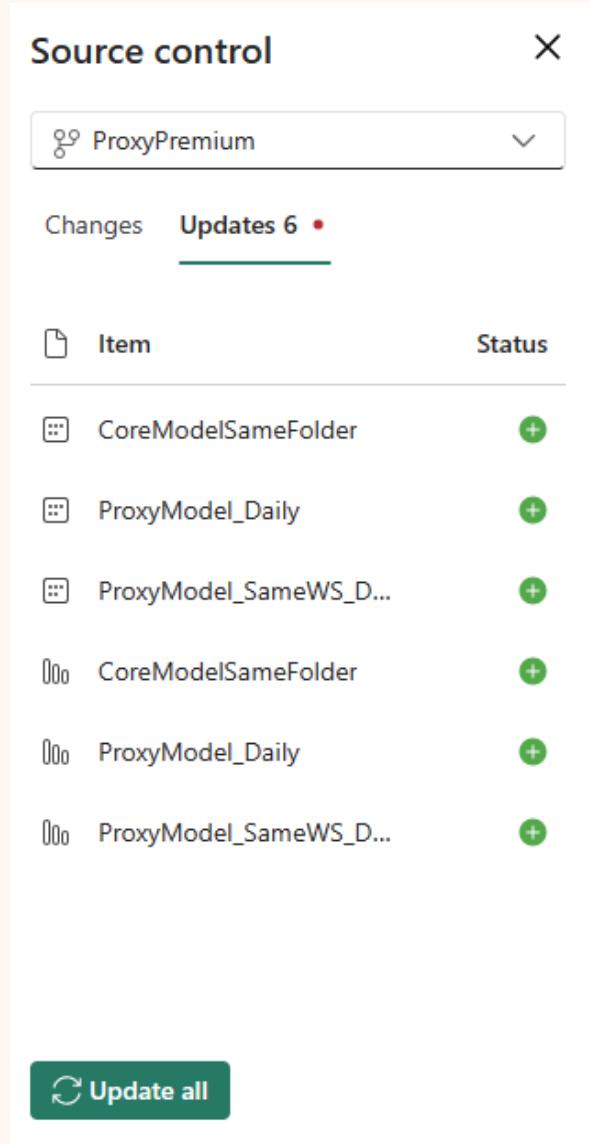
Source control X

ProxyPremium

Changes Updates 6 •

Item	Status
CoreModelSameFolder	+
ProxyModel_Daily	+
ProxyModel_SameWS_D...	+
CoreModelSameFolder	+
ProxyModel_Daily	+
ProxyModel_SameWS_D...	+

↻ Update all

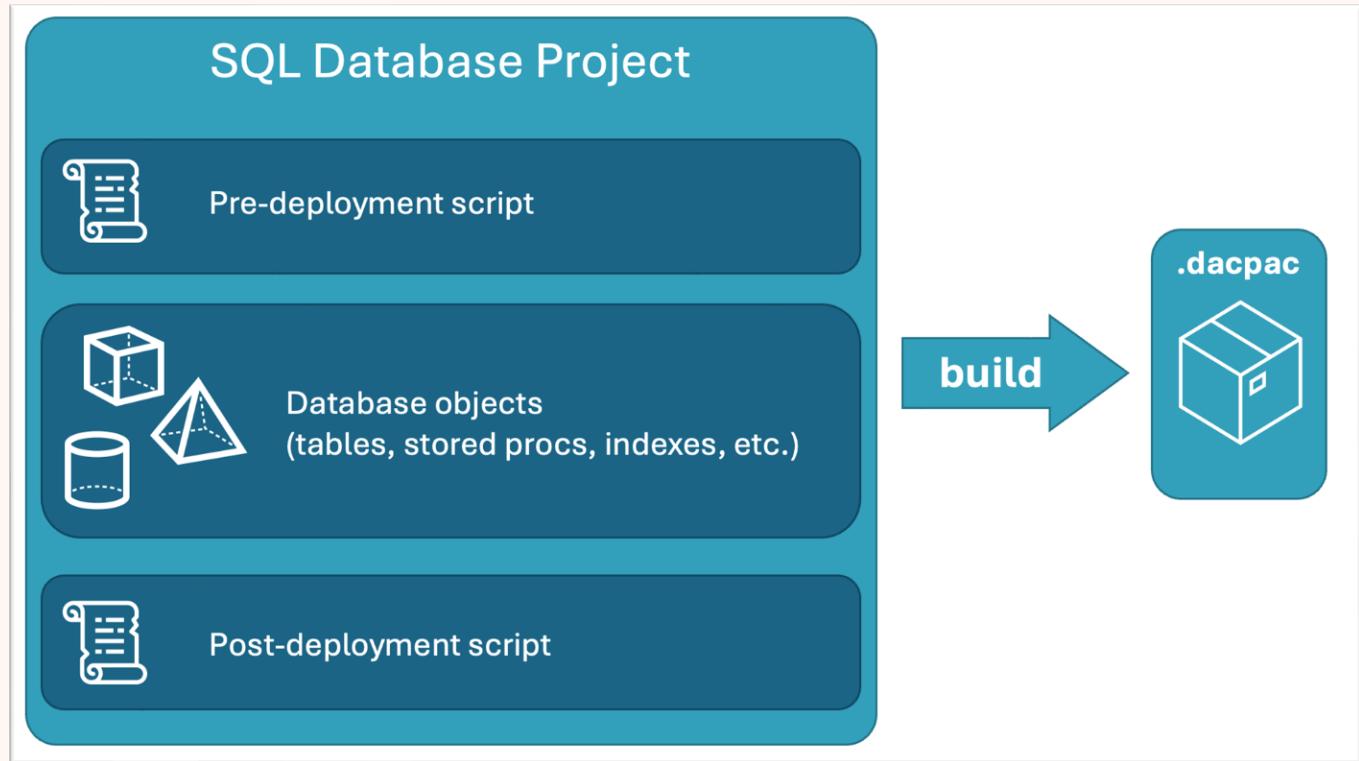


Lifecycle management in Microsoft Fabric

- Per-workspace source control integration (1 branch per workspace)
- Commit objects to source control
- Update objects from source control

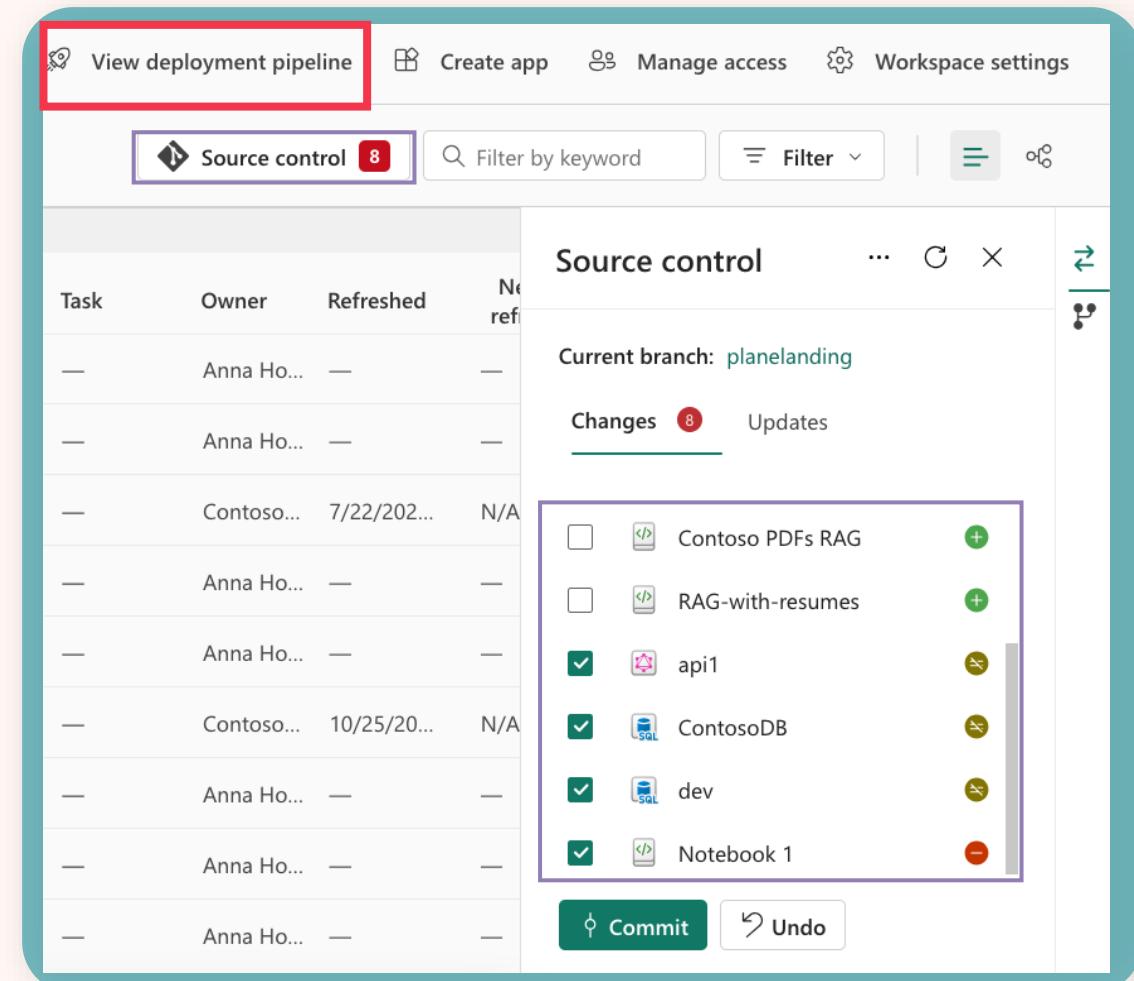
What's in the database code?

- SQL database project
- 1 file for each object
- Definitions as CREATE T-SQL statements
- Build process validates database model
- Portable and reusable artifact of database state



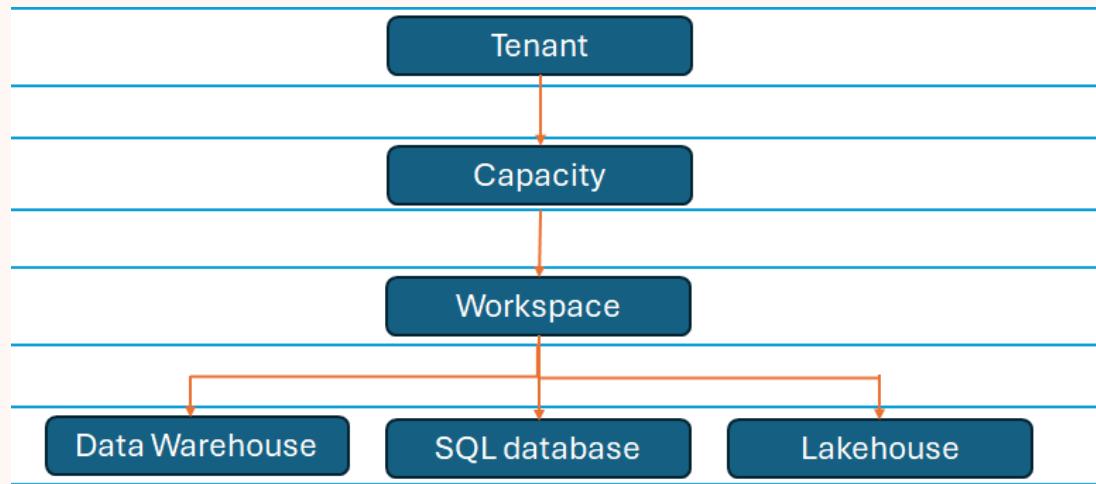
Deployment pipeline and source control

- Commit changes directly to source control from within Fabric
- Source control integration with both GitHub and Azure DevOps
- Deploy changes to your database using deployment pipelines and a multi-workspace environment



COFFEE BREAK (15:15 – 15:45)

Security Overview at the Fabric level

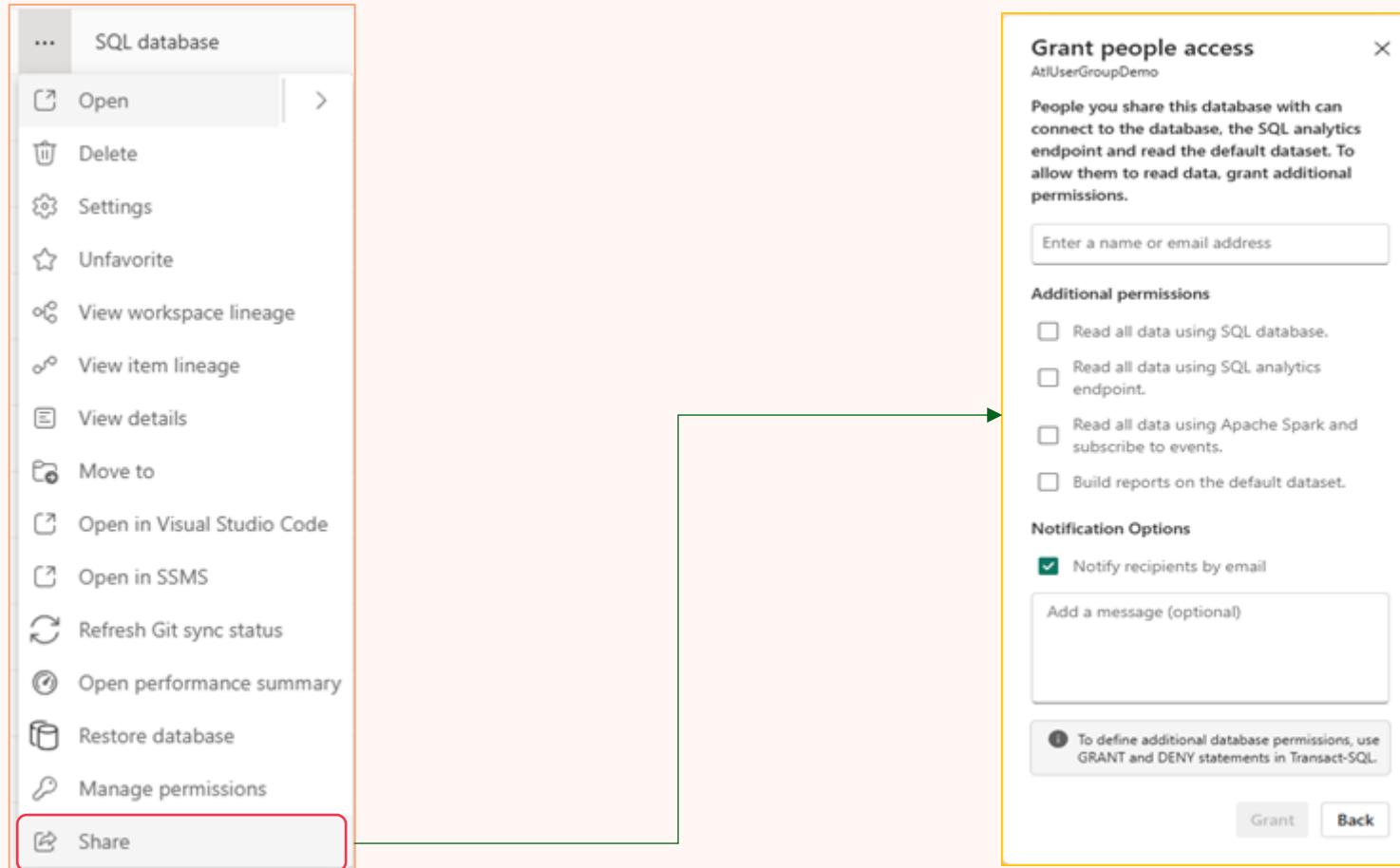


Workspace Roles

- Admin
- Member
- Contributor
- Viewer



SQL database item level Access



SQL database Access

The screenshot illustrates the process of managing SQL security roles in a database named 'AtlUserGroupDemo'. It shows three main windows:

- Main Window:** Shows the 'Security' tab selected in the ribbon. A red box highlights the 'Manage SQL security' button in the toolbar.
- Manage SQL security Dialog:** A modal window titled 'Manage SQL security' for the 'AtlUserGroupDemo' database. It displays a list of roles:

Role name	Role type
db_owner	Built-in
db_datareader	Built-in
db_datawriter	Built-in
db_ddladmin	Built-in
TestRole	Custom

A green box highlights the '+ New role' button, and a red box highlights the 'Manage access' button in the toolbar.
- New role Dialog:** A modal window titled 'New role' for creating a new schema permission role. It has fields for 'Role name *' (set to 'NewRole') and 'Included schemas *'. Under 'Included schemas', the 'Schema' checkbox is checked, and the 'SalesLT' schema is selected with its 'Select' permission checked. Other schemas like 'dbo' have all permissions unchecked. Buttons at the bottom include 'Save' and 'Cancel'.

Arrows indicate the flow from the main window to the 'Manage SQL security' dialog, and from there to the 'New role' dialog.



SQL database Permissions using UI

The screenshot illustrates the process of managing database permissions using the Microsoft Fabric UI. It shows two overlapping windows:

- Left Window (Foreground):** A "Manage access" dialog for the "db_datawriter" role. It lists "Idris Motiwala" and has an "Add" button highlighted with a red box.
- Right Window (Background):** A larger "Manage access" window showing the "People, groups or apps in this role" section. It lists "Idris Motiwala" with an email of "imotiwala@microsoft.com". A green arrow points from the "Add" button in the foreground window to the "Search" input field in the background window.

Manage access
Add or remove users for db_datawriter.
Add people, groups or apps
Add Clear

Manage access
Add or remove users for db_datawriter.
Add people, groups or apps
Add Clear

People, groups or apps in this role

Remove Search

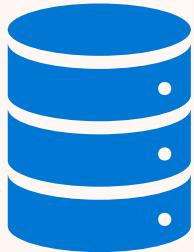
Name ↑ Email

IM Idris Motiwala imotiwala@microsoft.com

Certain users, groups, or applications currently lack the necessary permissions to connect to the database. Please share the database with these entities to enable their connection.

Share database Save Cancel

Module 9: Security – Access management



Learning Goal

How to secure your SQL database via Fabric workspace roles.

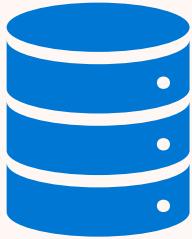
How to secure your SQL from within the SQL database using a UI/T-SQL

What will you do?

Assign users to workspace roles.

Assign users permissions using SQL database UI as well as using T-SQL.

Module 10: Managing Production Workload



Learning Goal

Understand Performance dashboard capability to monitor SQL database.

Learn how to successfully apply dev-ops

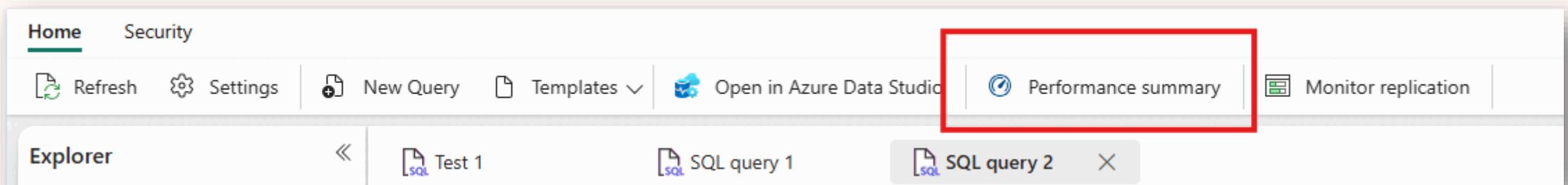
What will you do?

Use Performance Dashboard to analyze metrics, identify performance bottlenecks, and diagnose.

Integrate with Git repositories for version control of database objects and schema.

Automate deployment for streamlined operations.

Performance Dashboard



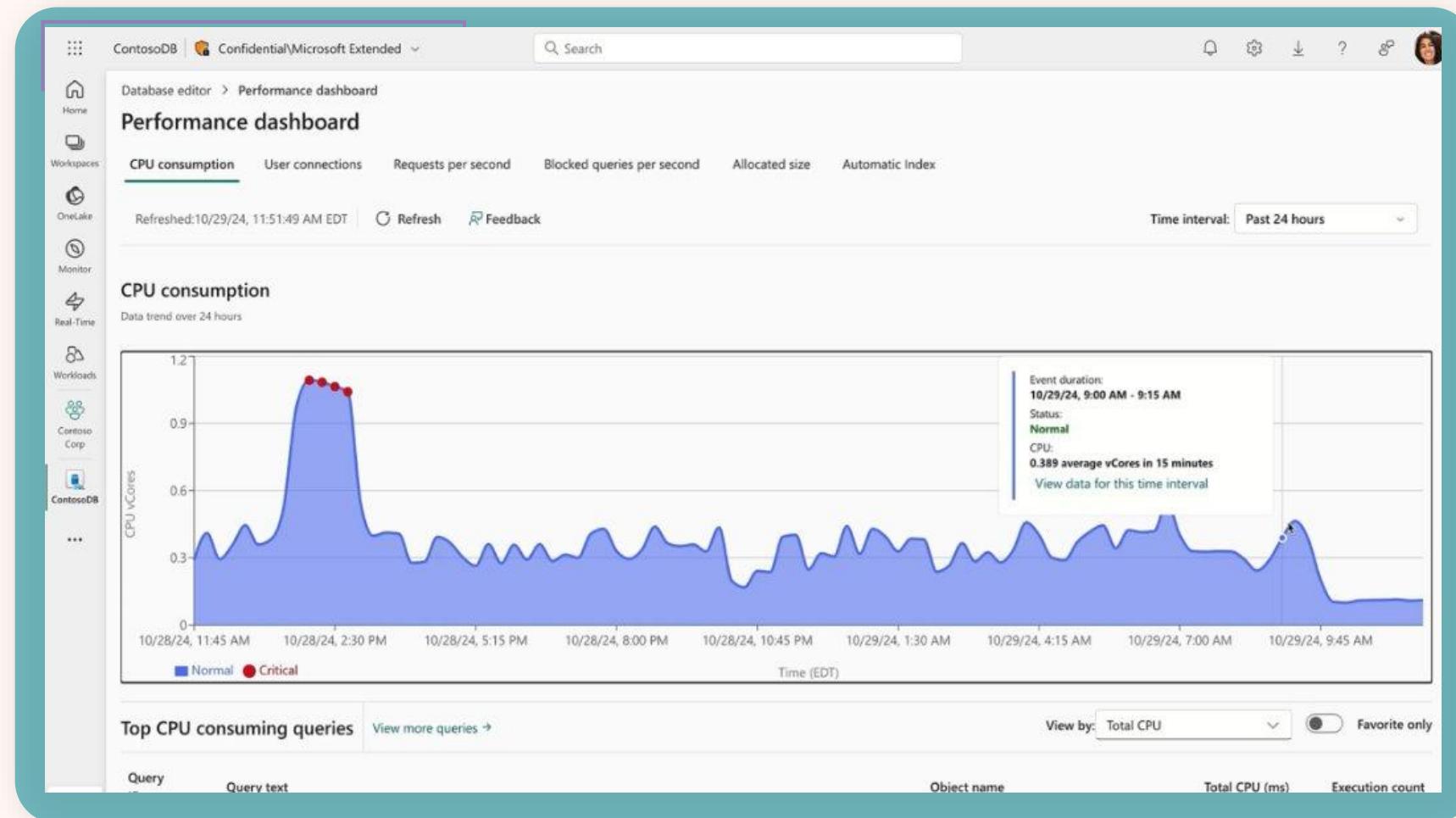
- The Performance Dashboard provides a user-friendly visual interface that helps pinpoint and resolve performance bottleneck
- Integrated seamlessly within the Fabric SQL query editor

Alerts

Tab	Threshold	Criteria
CPU consumption	80% of the allotted value	If the monitor finds the CPU above the threshold for more than five minutes. The monitor checks at a frequency of one minute.
Allocated Size	80% of the allotted size	If the monitor finds the size above the threshold for more than five minutes. The monitor checks at a frequency of one minute.
Blocked Queries	One Blocked Query	If there is at least one blocked query which has been blocked for more than one minute. The monitor is expected to check this every three minutes.

Built-in reporting areas/tabs of the Performance Dashboard

1. CPU consumption
2. Memory Consumption
3. User connections
4. Request per second
5. Blocked queries per second
6. Allocated size
7. Automatic indexes



Performance dashboard - Alerts

trial\Microsoft Extended

Search

Trial:
21 days left

SQL database

Home Replication Security

Get data New Query Templates Open in New API for GraphQL Performance summary Copilot

Your Fabric SQL database performance is critical and needs your attention. Show Details

Explorer Address

Data preview - Address

Showing 1000 rows

Search

demodb

dbo

Tables

BuildVersion

ErrorLog

Views

Stored Proced...

Functions

Shortcuts

SalesLT

Address

Customer

Address

	123	AddressID	ABC	AddressL...	ABC	AddressL...	ABC	City	ABC	StateProv...	ABC	CountryR...	ABC	PostalCode	ABC	rowguid	ABC	Modified.
17	454	3255 Front St...	NULL	Toronto	Ontario	Canada	M4B 1V6	ef4dc57d-8b8...	2007-08-01T0...									
18	455	2550 Signet D...	NULL	Weston	Ontario	Canada	M9V 4W3	43d582cf-e95...	2006-08-01T0...									
19	456	6777 Kingsway	NULL	Burnaby	British Colum...	Canada	V5H 3Z7	2f3b383e-08a...	2006-08-01T0...									
20	457	5250-505 Bur...	NULL	Vancouver	British Colum...	Canada	V7L 4J4	93f02c61-783...	2006-07-01T0...									
21	458	600 Slater Str...	NULL	Ottawa	Ontario	Canada	K4B 1S2	49f4ee42-e20...	2005-07-01T0...									
22	459	25575 The Qu...	NULL	Etobicoke	Ontario	Canada	M9W 3P3	616235ea-dc...	2005-08-01T0...									
23	460	2521 McPhers...	NULL	Markham	Ontario	Canada	L3S 3K2	7d6f03ac-5d5...	2007-08-01T0...									
24	461	2560 Bay Street	NULL	Toronto	Ontario	Canada	M4B 1V7	726819a8-1b...	2006-08-01T0...									
25	462	630 Universit...	NULL	Toronto	Ontario	Canada	M4B 1V7	27d5bdad-64...	2005-08-01T0...									
26	463	992 St Clair A...	NULL	Toronto	Ontario	Canada	M4B 1V7	d6ed51fa-6d...	2005-09-01T0...									
27	464	99, Rue Saint-...	NULL	Pnot-Rouge	Quebec	Canada	J1E 2T7	c4a1ee36-814...	2005-07-01T0...									
28	465	25245 Rue Sh...	NULL	Montreal	Quebec	Canada	H1Y 2H5	10ee8c14-27...	2007-07-01T0...									
29	466	655-4th Ave S...	NULL	Calgary	Alberta	Canada	T2P 2G8	09c5f0ba-712...	2005-08-01T0...									
30	467	25900-700-9t...	NULL	Calgary	Alberta	Canada	T2P 2G8	13560188-ce...	2005-11-01T0...									
31	468	Po Box 83270	NULL	Vancouver	British Colum...	Canada	V7L 4J4	c00a5dff-b13...	2007-08-01T0...									
32	469	400-25155 W...	NULL	Vancouver	British Colum...	Canada	V7L 4J4	b81768f9-3b0...	2007-09-01T0...									

Succeeded (6 sec 828 ms)

Columns: 9 Rows: 450



Home



Create



Browse



OneLake



Apps



Metrics



Workspaces



Fabric_Demo_Subasak



demodb

...

Database editor > Performance dashboard

Performance dashboard

[CPU consumption](#)[User connections](#)[Requests per second](#)[Blocked queries per second](#)[Allocated size](#)[Automatic Index](#)

Refreshed: 12/19/24, 6:57:03 PM GMT+5:30

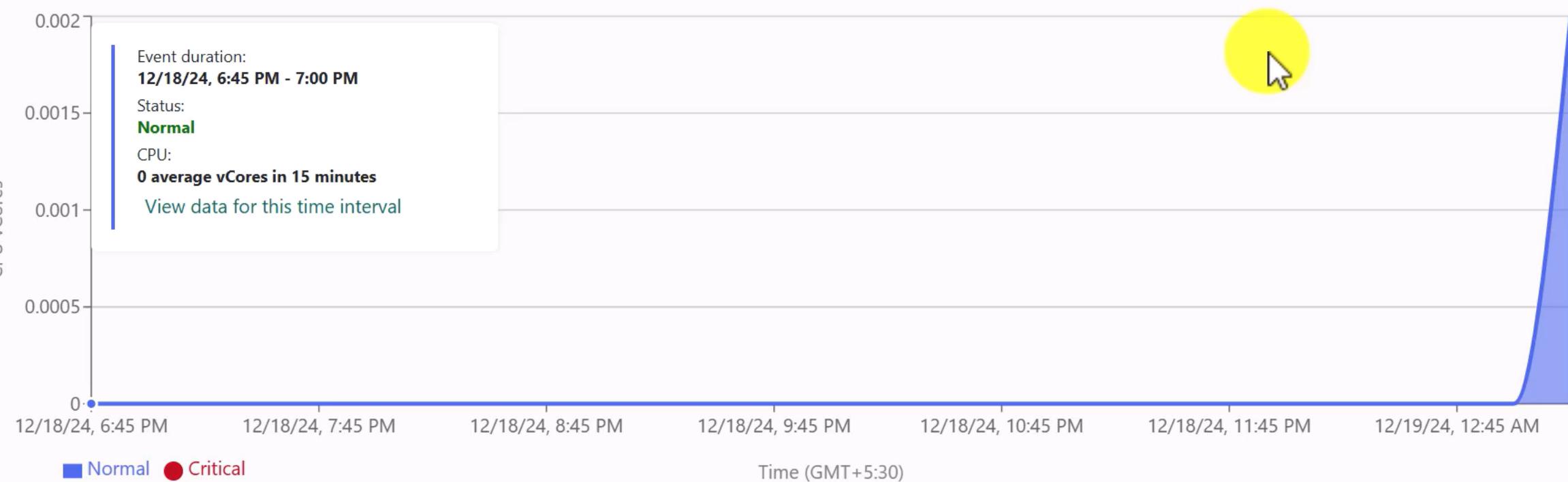
Refresh

Feedback

Time interval: Past 24 hours

CPU consumption

Data trend over 24 hours



Power BI

Home

Create

Browse

OneLake

Apps

Metrics

Workspaces

Fabric_Demo_Subasak

demodb

...

Power BI

Database editor > Performance dashboard

Performance dashboard

CPU consumption

User connections

Requests per second

Blocked queries per second

Allocated size

Automatic Index

Refreshed: 12/19/24, 7:09:32 PM GMT+5:30

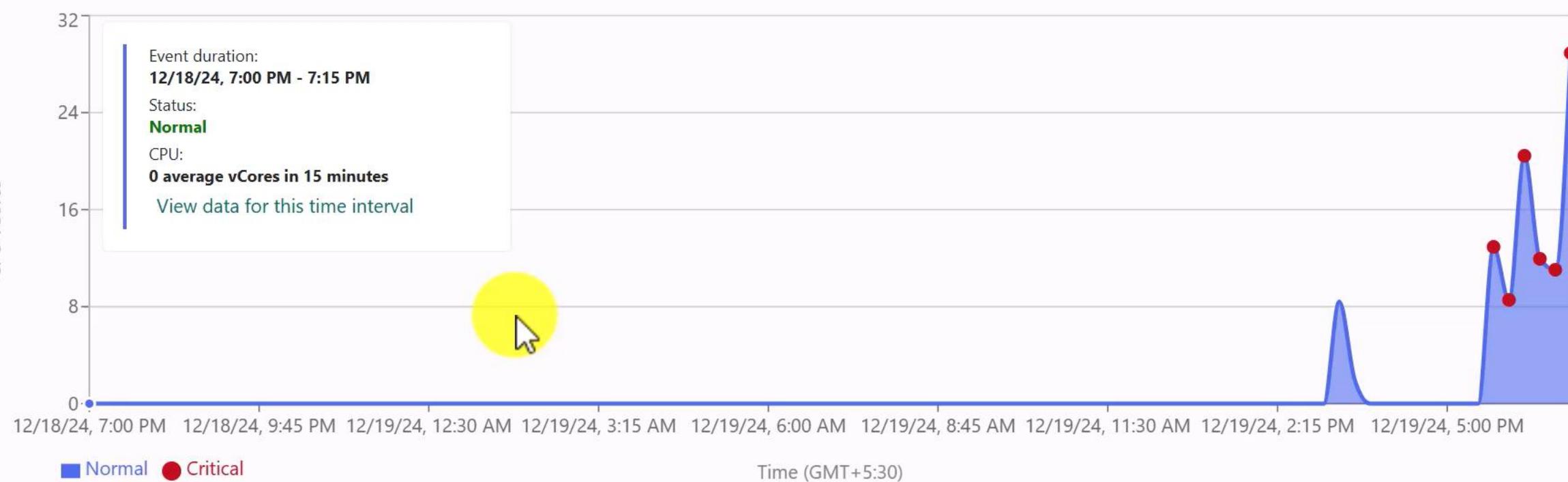
Refresh

Feedback

Time interval: Past 24 hours

CPU consumption

Data trend over 24 hours



CPU consumption

User connections

Requests per second

Blocked queries per second

Allocated size

Automatic Index

Refreshed: 12/19/24, 7:06:00 PM GMT+5:30

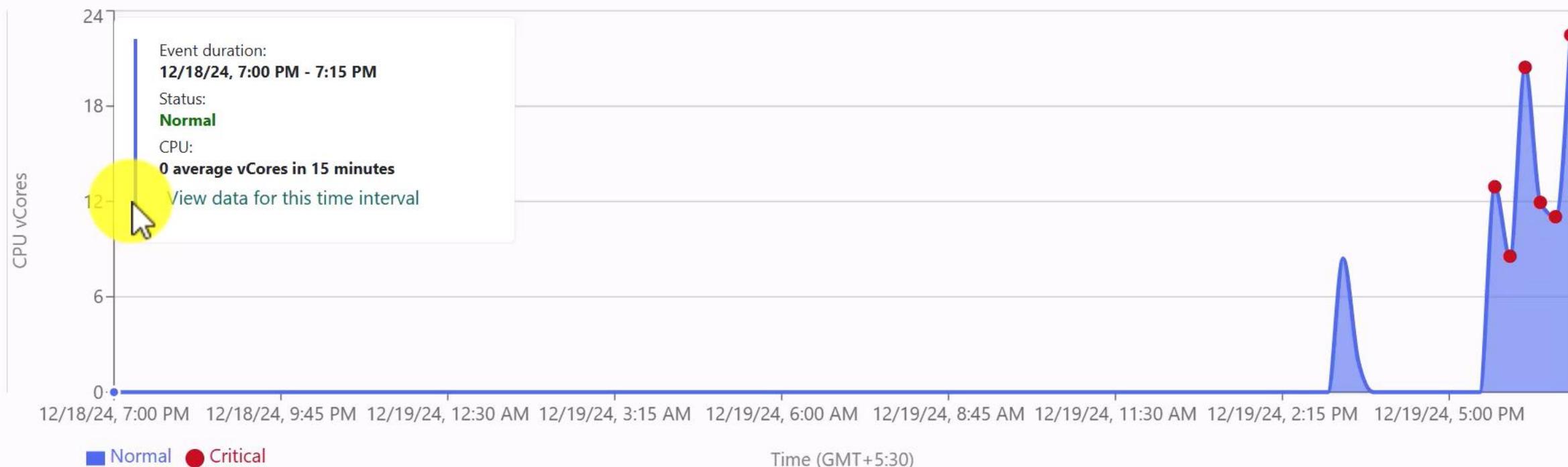
Refresh

Feedback

Time interval: Past 24 hours

CPU consumption

Data trend over 24 hours



Top CPU consuming queries

[View more queries →](#)

View by: Total CPU



Favorite only

CertifiedEvents - Repos x sesha-db1 - Fabric x +

https://daily.powerbi.com/groups/a9169842-463a-4db1-a1f1-d0d8748e9ce8/sqldatabases/9750ad6d-65a4-416b-a5ed-627f03957988?trident=1&... A ⭐ ⚙ 🔍 Update ...

Fabric sesha-db1 ✎ Confidential\Microsoft Extended Search Trial: 10 days left

Home Replication Security

Get data New Query Templates Open in New API for GraphQL Performance summary Copilot

Explorer <

Search

> sesha-db1

Queries > My queries > Shared queries

Query, preview, or connect your data

Interact with your data by starting a query, creating database objects with a template, or connecting the database to your app with a GraphQL API. You can also preview your data by opening a table or view.

+ New

Home Workspaces OneLake catalog Monitor Real-Time Workloads sesha-ws My workspace ...

Fabric



MAQ Software



slalom



HEXAWARE



snp technologies inc.



A ASCENT



protiviti®
Global Business Consulting



bouvet



ORAYLIS

softserve



Hso



macaw

Tiger Analytics



peopleTECH
A Quest Global Company



Columbus



IT-LOGIX
BUSINESS INTELLIGENCE

QUISITIVE

ATERA

Blackbook ai

ZURE

SDK

Blueforte



Hitachi Solutions

bravent
Igniting Innovation

SANTOR
Analytics That Drive Results

delaware



element61
enriching experiences & aspirations

Fellowwind

TREDENCE
Beyond Possible

igerencia
Data never sleeps, you do.

Simpson
Associates

((CENTRIC))

kanerika

aka.ms/FabricDatabasesFeaturedPartners



Key SQL database in Fabric customers

Learn more about Fabric databases



Learn more about Fabric databases
aka.ms/FabricSQLdatabase



Explore Fabric tutorials
aka.ms/Fabric-tutorials



Discover more from the Data Exposed series
aka.ms/Data-Exposed

Check out databases focused keynotes & sessions



1) Day 2
Keynote
Exploring the
Fabric
Ecosystem:
Databases,
Security, and AI
at Scale

2) Priya & Bob's Core note
Tuesday, 10:30 – 11:30 AM
The roadmap for Microsoft SQL
ground to cloud to fabric



3) Strahinja & Idris
Tuesday, 12:00 – 13:00 PM
Unleash the power of SQL
Database In Fabric – Deep Dive

Microsoft sessions

SQL Server 2025: The AI-ready enterprise Database Connected with Fabric
Tuesday, Sept 16 at 15:30–16:30 PM

AI Agents and Intelligent RAG with SQL and Microsoft Fabric
Wednesday, Sept 17 at 12:00–13:00 PM

Mirror and Modernize: Operational and Analytical SQL Workloads
Thursday, Sept 18 at 14:15–15:15 PM

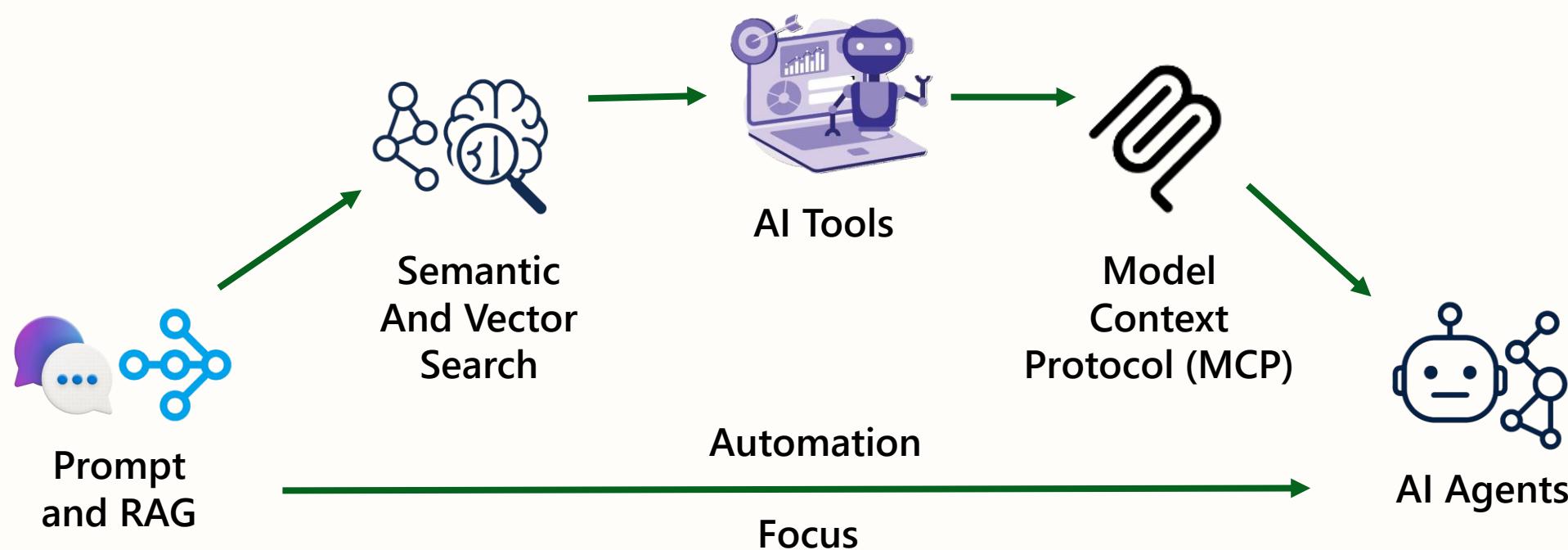
Community sessions

Azure SQL Database vs. SQL Database in Fabric: Key Differences
Wednesday, Sept 17 at 14:15–15:15 PM

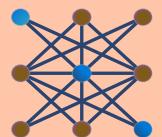
CI/CD for SQL Database in Fabric using Azure DevOps
Wednesday, Sept 17 at 15:30–16:30 PM

Fabric Write-Back with Power BI, Power Apps, and SQL Databases
Thursday, Sept 18 at 10:30–11:30 AM

The path for AI applications



The app *controls* everything

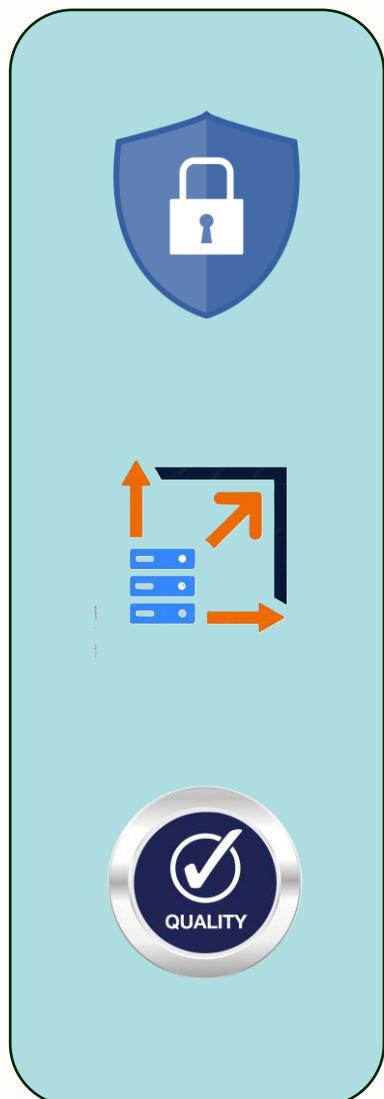


AI models = algorithms != executable programs
No persistence or memory

Knowledge Sources and tools



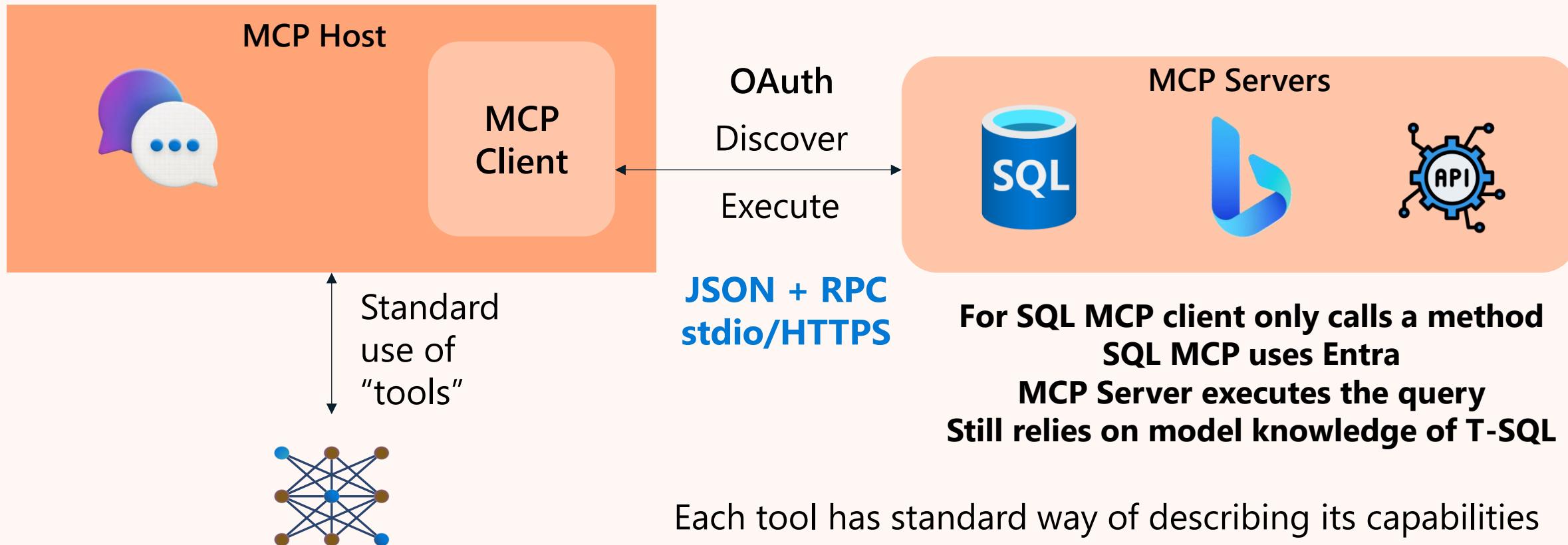
Security
Scalability
Quality



MCP - Model Context Protocol

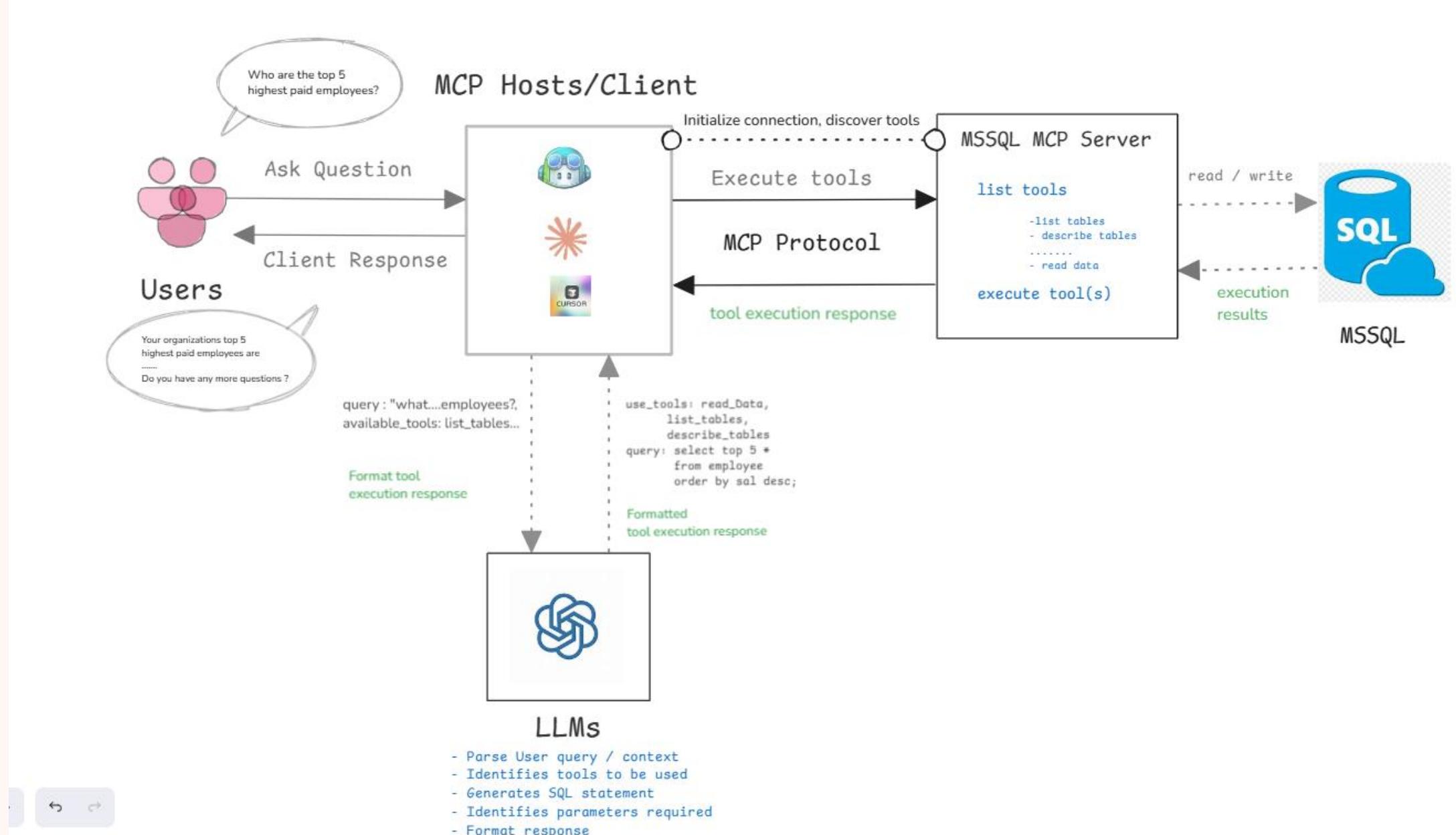
"The USB for AI Tools"
[Find a MCP server near you](#)

Standardized method for AI applications to
discover and use external tools and data sources with AI Models



The new SQL MCP Server

Read our [blog](#)





Edit with Copilot

Agent Mode

Ask Copilot to edit your files in [agent mode](#). Copilot will automatically use multiple requests to pick files to edit, run terminal commands, and iterate on errors.

Copilot is powered by AI, so [mistakes are possible](#). Review output carefully before use.

As an internal user, additional telemetry is collected. If you work on a project that contains [customer content](#), you must [disable telemetry](#).

📎 or type # to attach context

Add Context...

Edit files in your workspace in agent mode

Agent ▾ Claude Sonnet 4 (Preview) ▾

▾

Backup Retention

Extended PITR Retention: More Flexibility & Compliance

- PITR retention to be extended from the default 7 days up to 35 days
- Empowers organizations to meet stricter compliance requirements, improve operational recovery flexibility, and reduce risk from accidental data loss or malicious activity

Automated, Zone- Redundant Backups

- Automated backups by default: full backups weekly, differential backups every 12 hours, and transaction log backups every 10 minutes
- Stored in zone-redundant storage (ZRS), ensuring durability and availability across multiple Azure zones

Simple Configuration & Observability

- Retention is configured at the database level
- Users can easily adjust the retention window (1–35 days)

Roadmap

SQL database in Fabric – Bright future ahead

Security

- SQL Auditing (Public Preview)
- Customer-managed keys (Private Preview)

CoPilot & editor

- Display source control status
- Copilot improvements

Data Virtualization

- T-SQL support for OPENROWSET and CREATE External Table (Private Preview)

Config, Backup, Monitoring, Replication

- Support case-sensitive collation using API
- Performance Dashboard improvements

ALM, DevOps & Integrations

- CI/CD
 - Support system objects
 - Confirm data loss/table removal



<https://aka.ms/fabricsqlroadmap>

Resources

Get started and engage with the community
to accelerate your AI app development

[**https://aka.ms/FabConSQLDB**](https://aka.ms/FabConSQLDB) – public Git repo (consumable offline)

Explore the documentation and build with our end-to-end tutorials:

<https://aka.ms/fabricsqldocs>

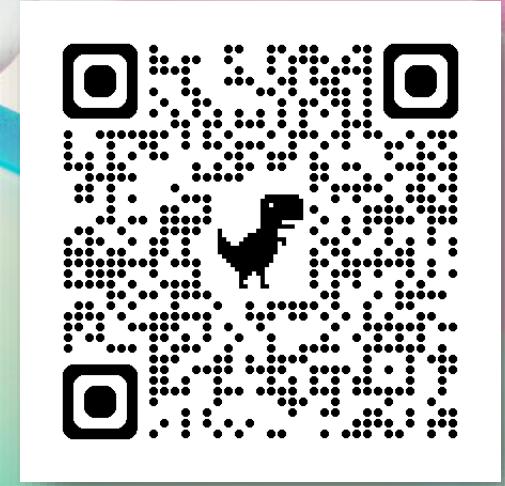
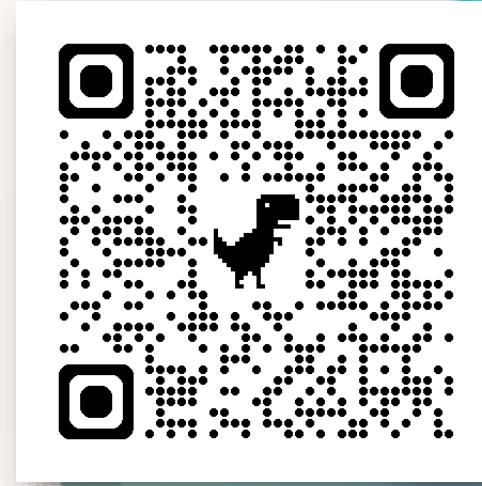
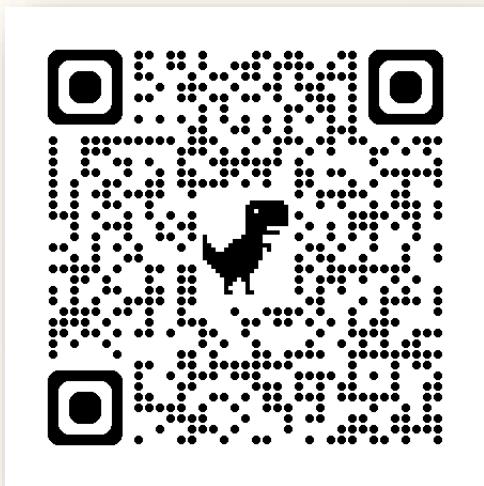
Skill up with our new learn modules: <https://aka.ms/learnfabricsql>

Watch episodes on Data Exposed: <https://aka.ms/dataexposedyt>

Ask questions, vote for ideas, and read the latest product news:

<https://community.fabric.microsoft.com/>

Let's connect via LinkedIn!





Get Involved in the Fabric Community



aka.ms/FabricCommunity

Connect with community members, ask questions, and learn more about Fabric



aka.ms/FabricUserGroups

Find a user group that matches your interests in your area or online



aka.ms/SuperUsers

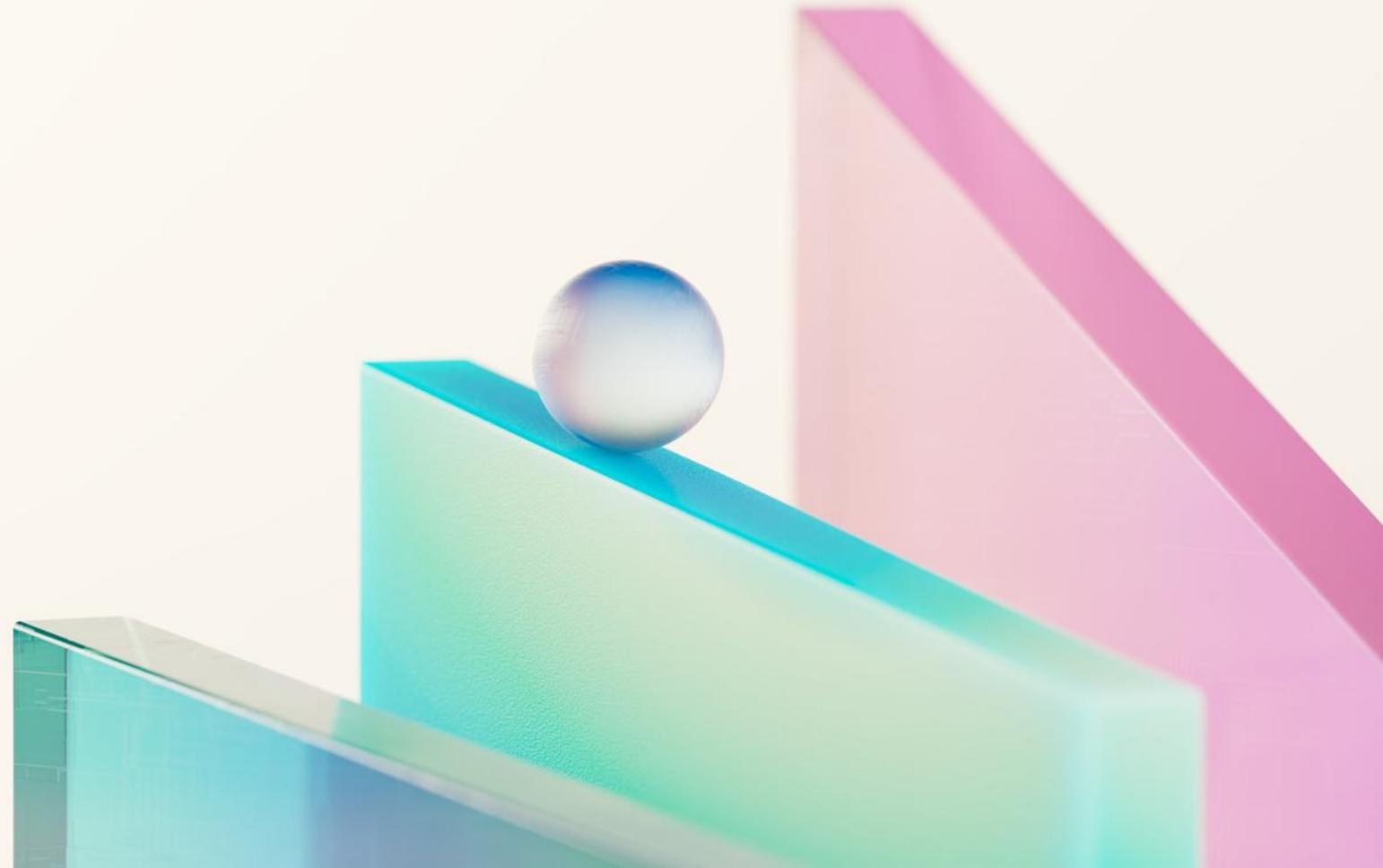
Spread your Fabric knowledge, insights, and best practices with others



aka.ms/MVP

Technology experts that share their knowledge and passion with the community

Thank you!



MSSQL extension & VS Code resources

Demos, blogs and documentation

- aka.ms/vscode-mssql-demos
- aka.ms/vscode-mssql-blogs
- aka.ms/vscode-mssql-docs

GitHub repository and roadmap

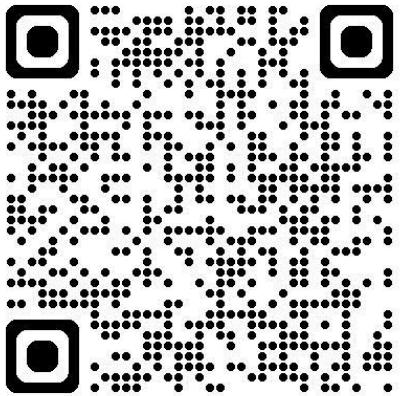
- aka.ms/vscode-mssql-repo
- aka.ms/vscode-mssql-roadmap

Share your feedback, ideas or report bugs

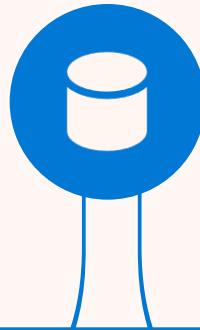
- aka.ms/vscode-mssql-bug
- aka.ms/vscode-mssql-feature-request
- aka.ms/vscode-mssql-copilot-feedback
- aka.ms/vscode-mssql-discussions



APPENDIX



aka.ms/ragpipeline



aka.ms/sqlai
aka.ms/sqlaisamples

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