



Microsoft Fabric

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SQL Copilots Unveiled: Architecture, Workflows, and Use Cases

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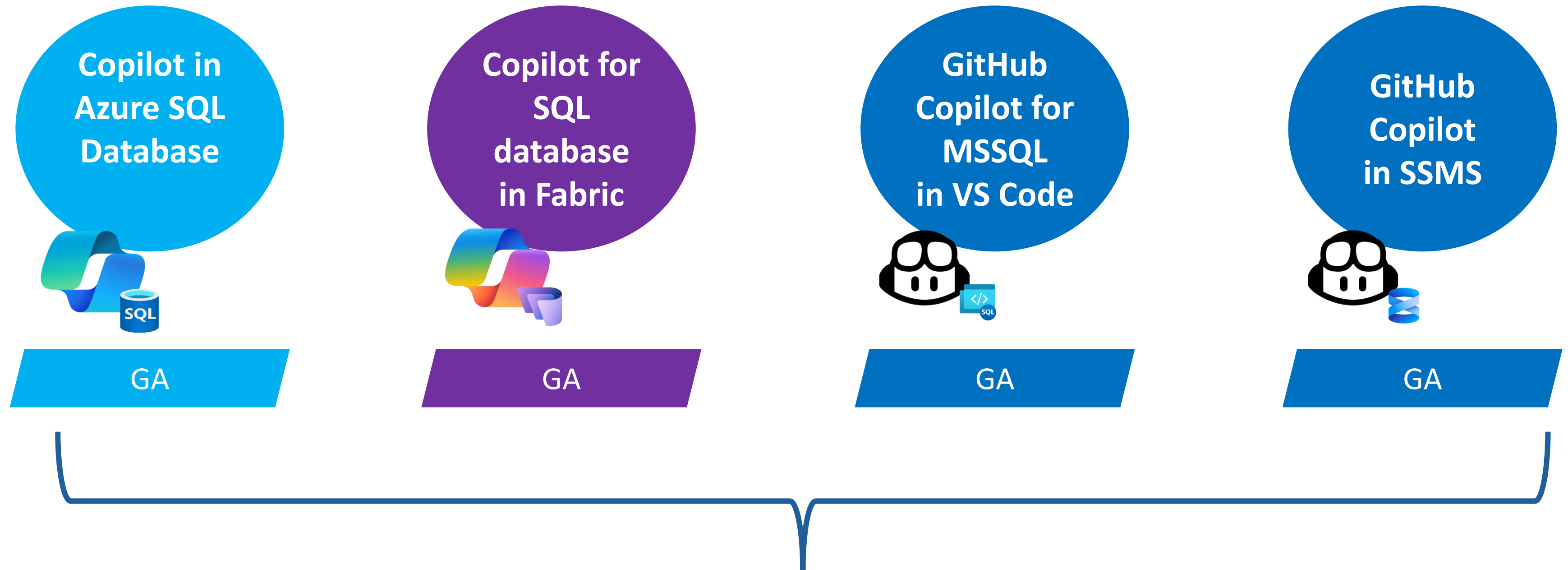
Erin Stellato

erinstellato@microsoft.com

Abstract

SQL Copilots are reshaping how users interact with SQL databases by accelerating query development, improving workflow efficiency, and enabling natural language interaction with complex SQL databases. This session provides a technical look at the architecture powering GitHub Copilot in SSMS and the MSSQL extension for VS Code, as well as Copilot for SQL database in Fabric. We'll explore the architecture, walk through top use cases, and showcase real-world demos to help you maximize Copilot impact for your SQL database.

Available SQL Copilots



SQL Copilot principles



Responses are grounded in the SQL database environment



Copilot only has access to resources that **YOU** have access to and can only perform analysis and actions that you have the permissions to perform



User-provided prompts and responses are **NOT** used to further train, retrain, or improve any models in Azure or elsewhere

Privacy and Security

Copilot data includes

- prompts

- responses

- feedback data

- engagement data

GitHub Copilot Trust Center:
<https://copilot.github.io/trust>

Copilot data is encrypted when transmitted, and at rest

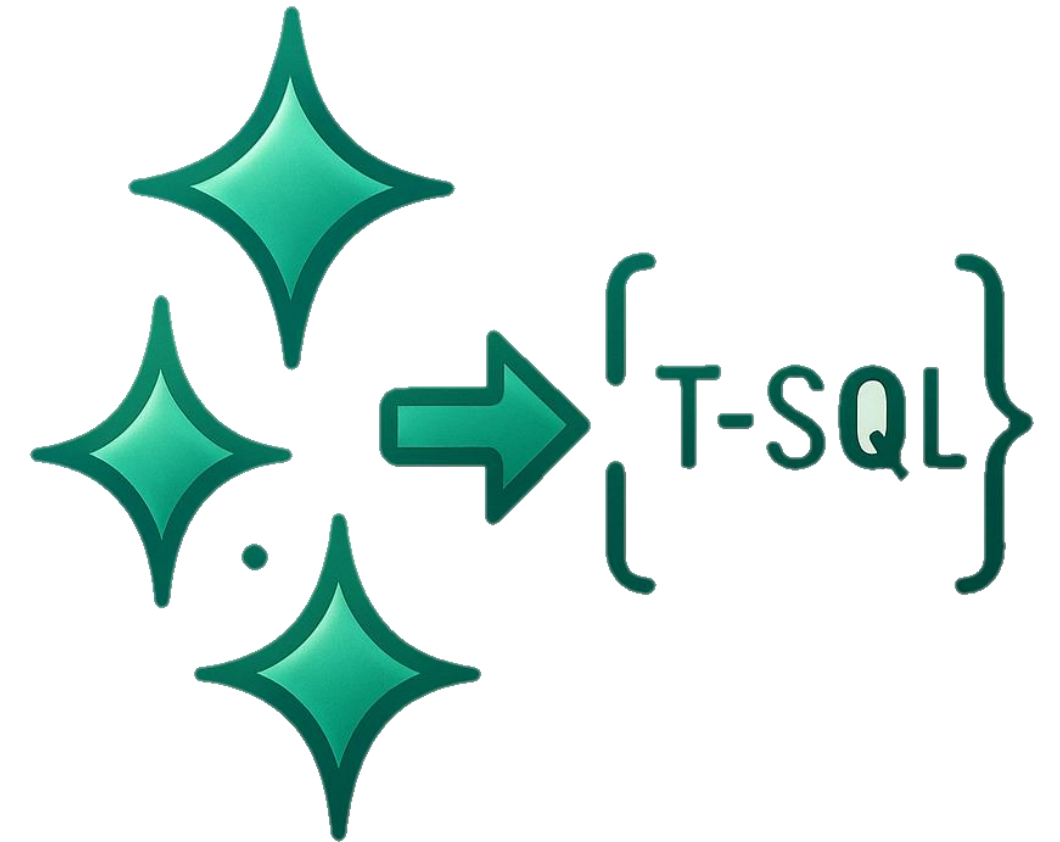
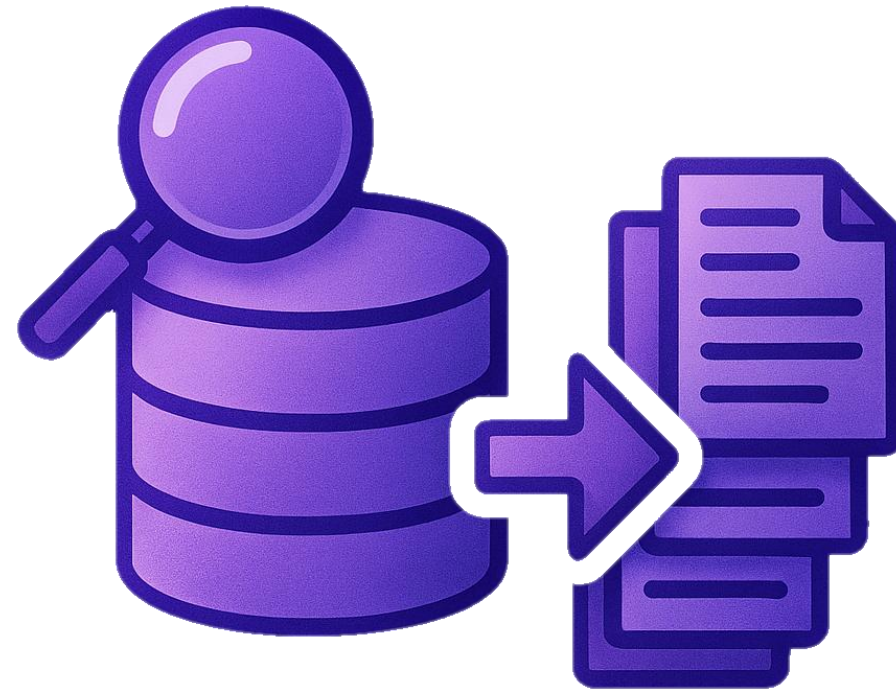
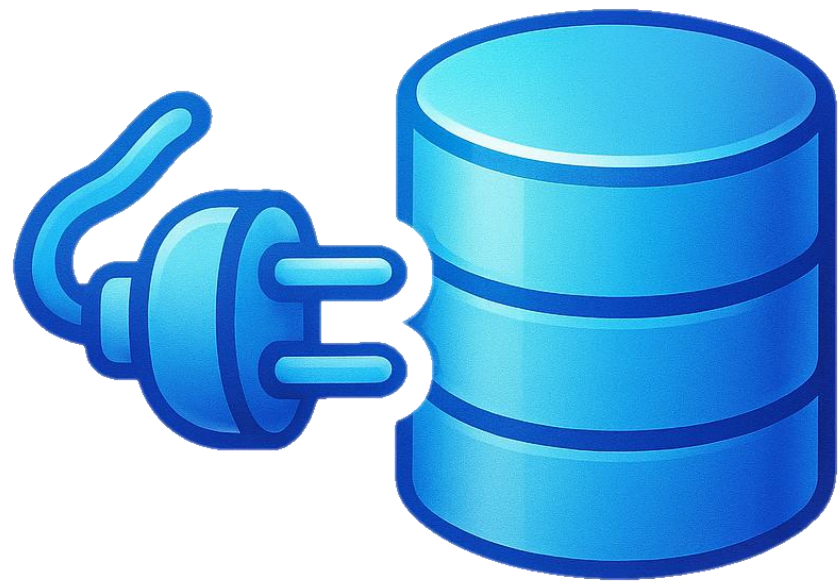
Microsoft Responsible AI:

<https://www.microsoft.com/ai/principles-and-approach>

SQL Copilots Architecture

The core code behind SQL Copilots is
a contextually dynamic,
RAG-based implementation

SQL Copilots Architecture



Context examples

Connection

Database schema

Editor contents

Additional files (added as references)

Database instructions

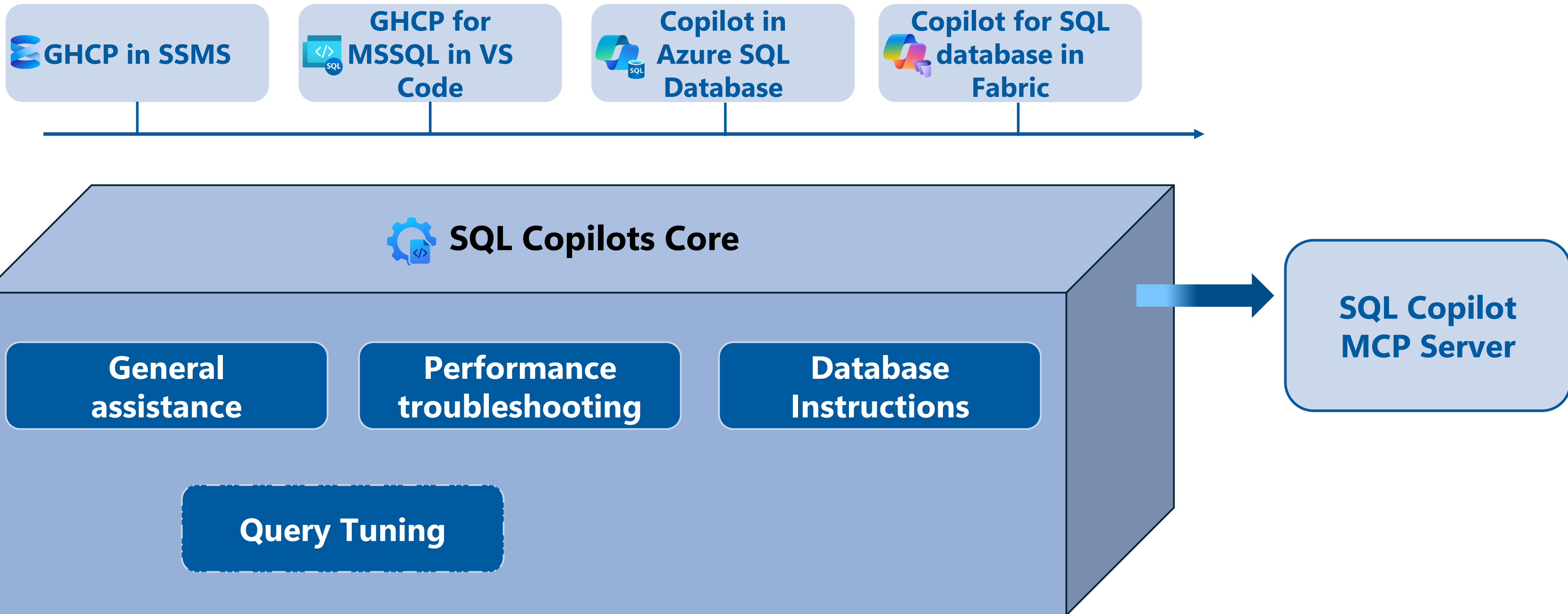
Database constitution

Custom instructions

Context examples

	Azure	Fabric	MSSQL	SSMS
Connection				
Database schema				
Editor contents				
Additional files				
Database instructions				
Database constitution				
Custom instructions				

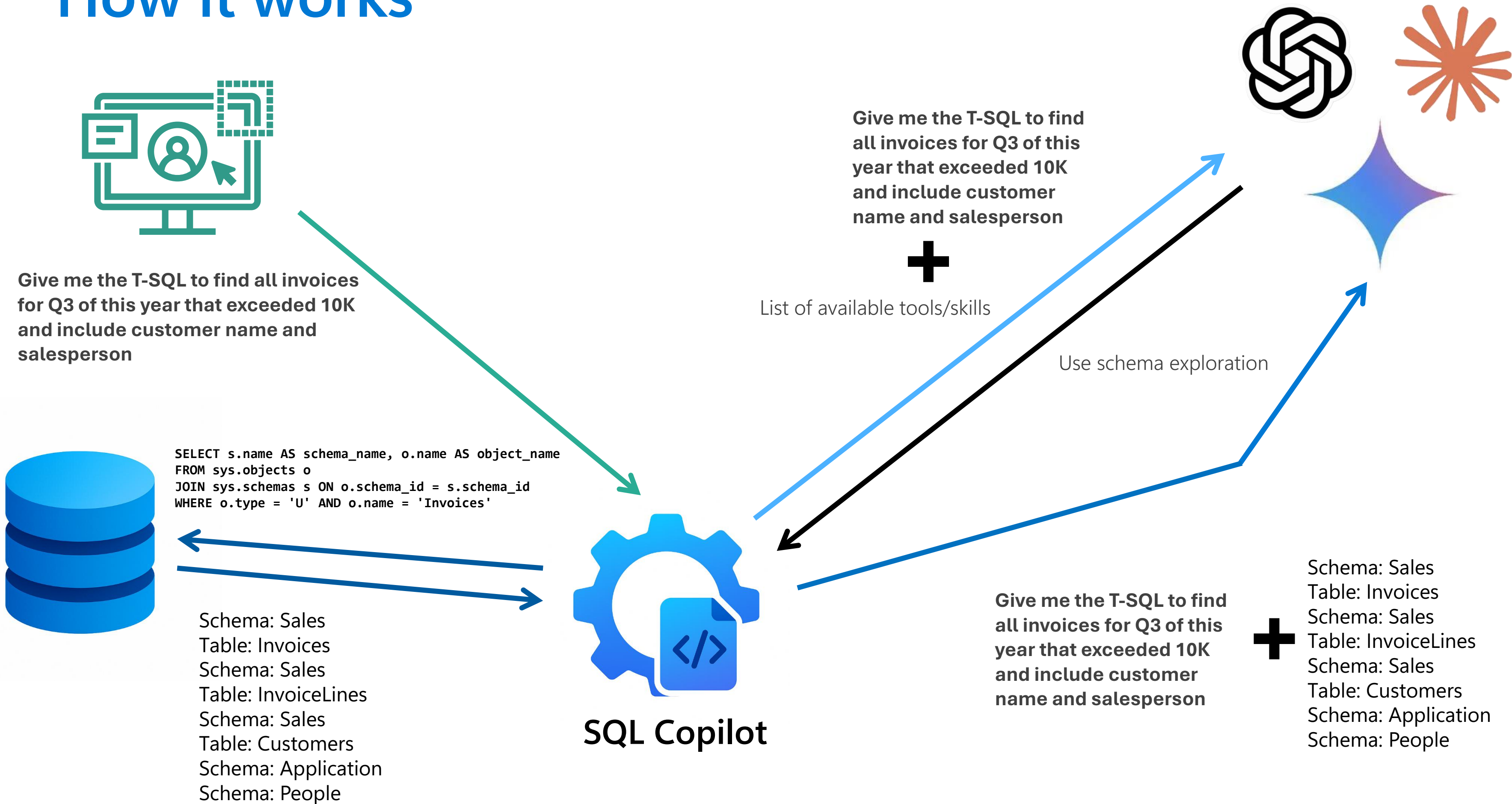
SQL Copilots



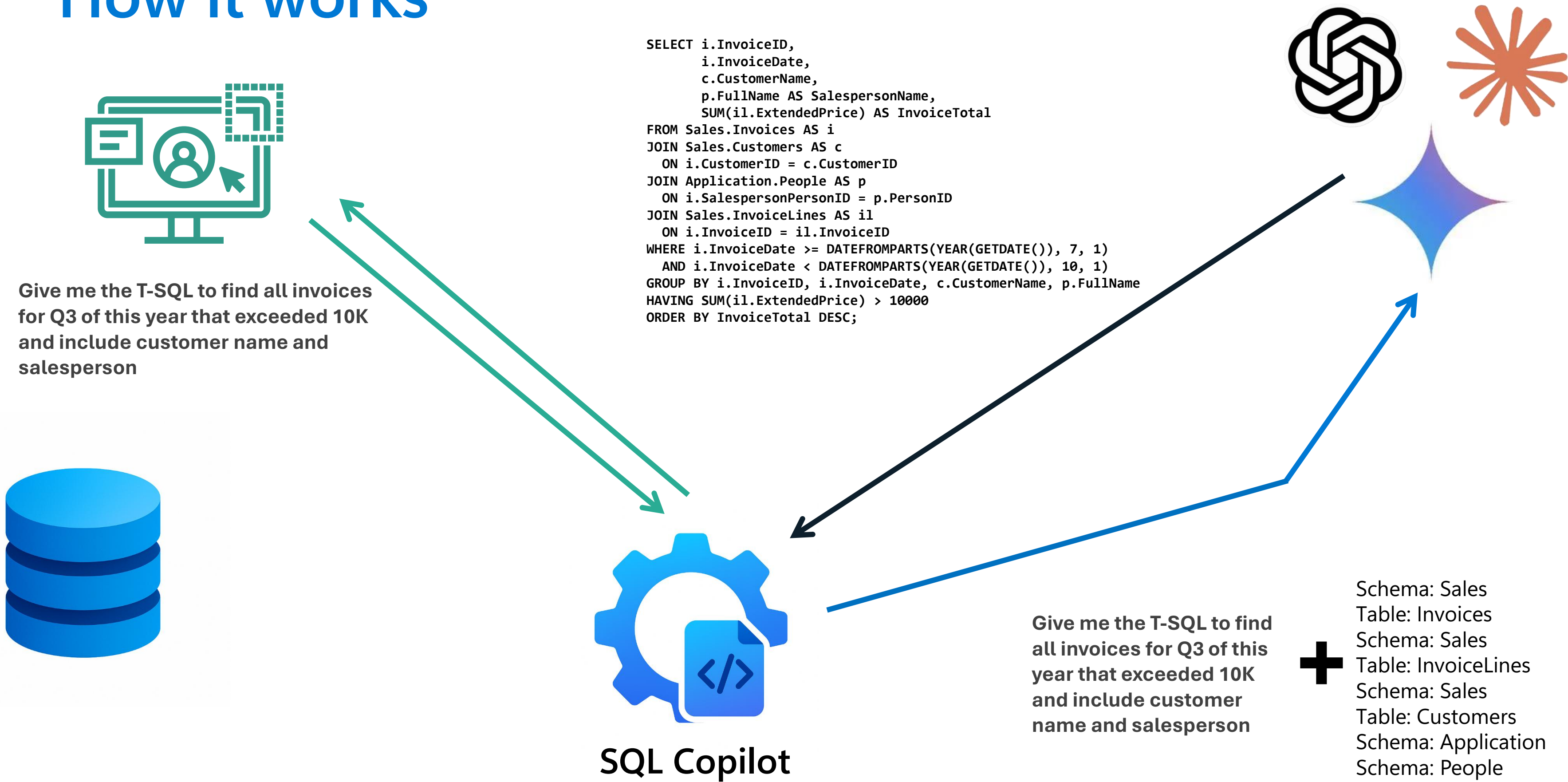
SQL Copilot MCP Server vs SQL MCP Server

	SQL Copilot MCP	SQL MCP
Primary purpose	Provide SQL Copilot features as MCP tools	Expose database objects as MCP tools
Integration	SQL Copilots Core	DAB
Example tool	FindRelevantDBObject	update_user_contact_info

How it works*



How it works*



Demo

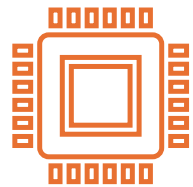
Copilot for SQL database in Fabric

Copilot Features in the Query Editor

Empowering SQL developers to write code faster and accelerate productivity



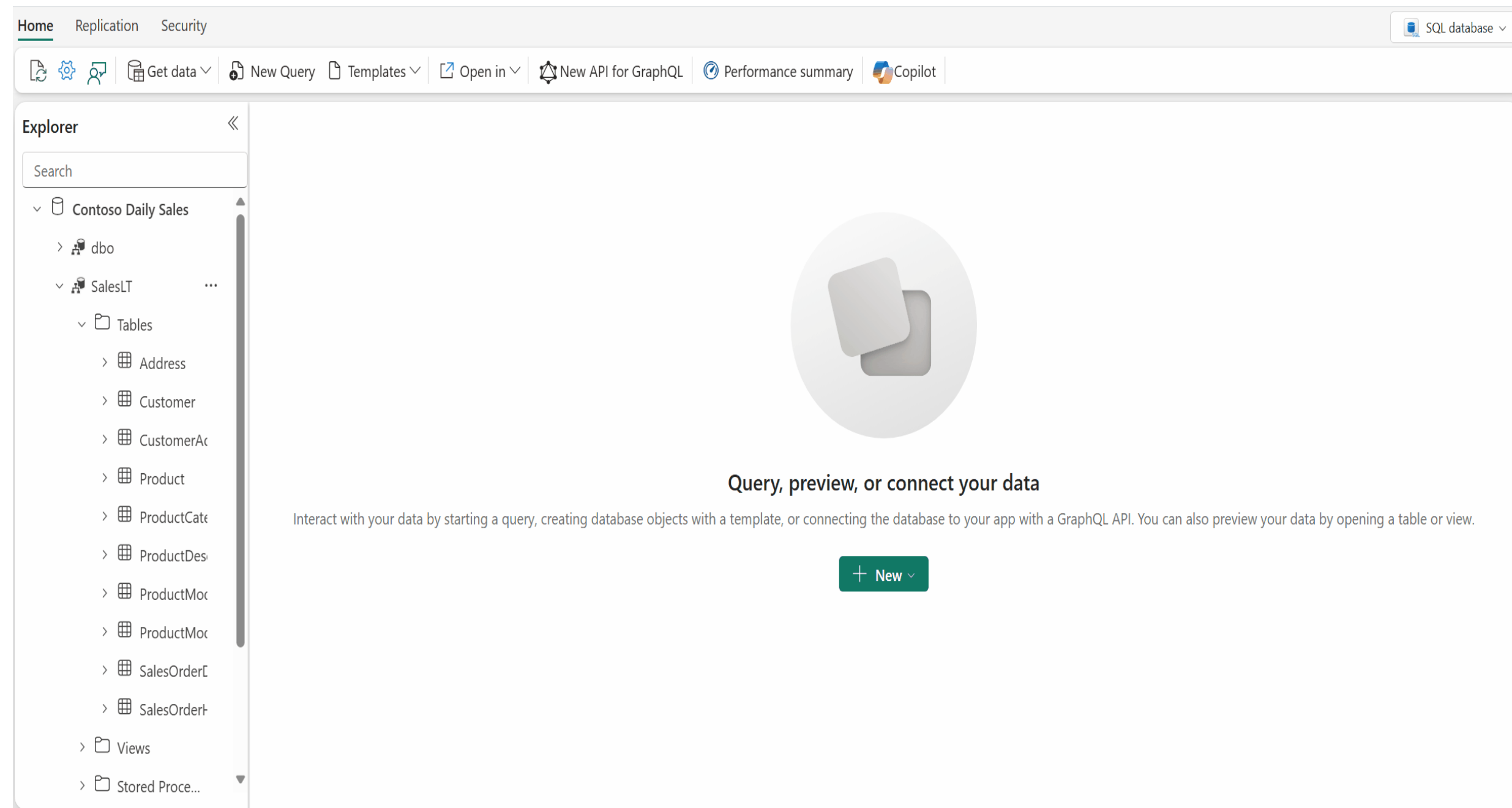
Start writing T-SQL and Copilot **Autocompletion** will automatically generate a code suggestion to help complete your query.



Copilot **Quick Actions** to explain the code and fix code errors.



Copilot **Sidecar Chat** to help with day-to-day tasks of a SQL developer.



	Name	Status	Type	Task	Owner	Refreshed	Next refre	
	DemoDatabase		SQL database	—	Yo-Lei Chen	—	—	
	DemoDatabase		SQL analytics end...	—	Yo-Lei Chen	—	—	

	Name	Status	Type	Task	Owner	Refreshed	Next refre	
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	DemoDatabase		SQL analytics end...	—	Yo-Lei Chen	—	—	

Microsoft Fabric

The unified data platform for AI transformation



Data Factory



Analytics



Databases



Real-Time
Intelligence



IQ



Power BI

Fabric Platform



AI



OneLake



Security & Governance



Microsoft Fabric items that support Copilot/AI Experiences

Workloads	Items	Use cases
 Analytics	Notebooks	Analyze & Develop: Notebook chat panel / chat magics; generate code or markdown; add comments; fix errors; debug; analyze & visualize data; explain notebook contents.
	Data agent, AI functions, AI services	AI Enrichment & Automation: Create Fabric data agents; transform and enrich data with AI functions; use Foundry tools in Fabric.
	Data Warehouse, SQL analytics endpoint	Analytical Query (OLAP): Code completion; quick fixes and code explanation; chat assistance for complex analytical queries generation, query optimization, etc.
 Data factory	Dataflows Gen2, Data Pipelines	Data Integration & Orchestration: Generate a new query; generate and run pipelines; summarize pipelines; troubleshoot pipeline errors.
 Databases	SQL database	Operational Query (OLTP): Code completion; fix / explain SQL; inline T-SQL help; chat assistance for schema design, data exploration, performance monitoring, etc.
 Power BI	Semantic models, Reports	Visualization & BI: Suggest synonyms and measure descriptions; write / explain DAX; ask questions; AI auto-summary; suggest pages / visuals; explain report pages or visuals.
 Real-time intelligence	KQL Queryset, Real-time Dashboard	Streaming Analytics: Generate, modify, or explore KQL; generate KQL for shortcuts; generate dashboards; edit tiles with Copilot.

Demo

GitHub Copilot for MSSQL in VS Code

SQL SERVER

CONNECTIONS

Cloud databases

Local databases

GitHub Copilot

Databases

System Databases

AdventureWorksLT2022

Library

TaskManager

Tables

Dropped Ledger Tables

Views

Dropped Ledger Views

Synonyms

Programmability

External Resources

Service Broker

Storage

Security

Security

Server Objects

GitHub Copilot - AI

QUERY HISTORY

Demo-Nocontext



Open Chat

Show All Commands

Open Settings

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CHAT

CLAUDE CODE

CODIX

SESSIONS

Tip: Use /create-agent to scaffold a custom agent for your workflow.

Describe what to build

+

Agent

Claude Opus 4.6

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Local

Default Approvals

Demo

GitHub Copilot in SSMS

SQLQuery6.sql - SQL Server 2025 - SQLQuery6.sql - SQL Server 2025 - Microsoft SQL Server Management Studio

File Edit View Query Git Project Tools Extensions Window Help

New Query

Execute

Change Type

Object Explorer

Connect

SQL Server 2025 (SQL Server 17.0.1050.2 - NORTHAMERICA\mbari)

Databases

- System Databases
- Database Snapshots
- MaksToyStore

Security

Server Objects

Replication

Always On High Availability

Management

Integration Services Catalogs

SQL Server Agent

XEvent Profiler

SQLQuery6....Server 2025

1

GitHub Copilot Chat

New Thread



Copilot Chat

I might make mistakes, so check for accuracy.
Use # for references, / for commands, and @ for agents.

Provide the T-SQL to create a table in the dbo schema to hold employee infor...

Which queries used the most CPU time in the last hour?

List the 10 largest tables in this database based on row count.

+ Active Document X

Claude Sonnet 4.5

120 %

No issues found

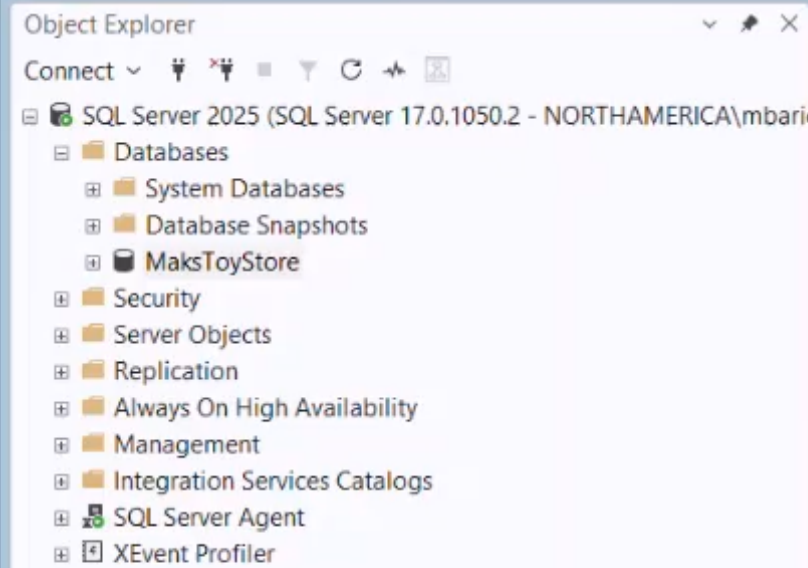
Ln: 1, Ch: 1 SPC CRLF UTF-8

Connected. (1/1)

(local) (17.0 RTM) MaksToyStore 00:00:00 Row: 0, Col: 0 0 rows

Ready

Select Repository



```
1  --create a table that holds Lego information. include LegoID, set name,
2  CREATE TABLE LegoSets (
3      LegoID INT PRIMARY KEY IDENTITY(1,1),
4      SetName NVARCHAR(255) NOT NULL,
5      Theme NVARCHAR(255) NOT NULL,
6      AgeRange NVARCHAR(50) NOT NULL,
7      PieceCount INT NOT NULL,
8      Price DECIMAL(10, 2) NOT NULL
9  );
```

120 % No issues found

Ln: 9, Ch: 3 SPC CRLF UTF-8

Messages

Commands completed successfully.

Completion time: 2026-02-10T14:57:42.8670385-08:00

120 % No issues found

Ln: 4, Ch: 1 TABS MIXED UTF-8 with BOM

Query executed successfully.

(local) (17.0 RTM) MaksToyStore 00:00:00 Row: 0, Col: 0 0 rows



Copilot Chat

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+ Active Document X



Claude Sonnet 4.5

SQLQuery6.sql - SQL Server 2025 • SQLQuery6.sql - SQL Server 2025 • Microsoft SQL Server Management Studio

File Edit View Git Project Tools Extensions Window Help

New Query

Execute

Object Explorer

Connect

SQL Server 2025 (SQL Server 17.0.1050.2 - NORTHAMERICA\mbari)

Databases

System DatabasesDatabase SnapshotsMaksToyStore

SecurityServer ObjectsReplicationAlways On High AvailabilityManagementIntegration Services CatalogsSQL Server AgentXEvent Profiler

SQLQuery6.sql... Server 2025

233

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248

INSERT INTO CustomerOrders (CustomerName, OrderDate, TotalAmount, LegoID

VALUES

('Emma Johnson', '2024-12-26 10:30:00', 99.99, 31),

('Brandon Lee', '2024-12-28 14:15:00', 349.99, 18),

('Olivia Taylor', '2024-12-24 11:20:00', 59.99, 47),

('Carlos Rodriguez', '2024-12-27 15:45:00', 249.99, 77),

('Sarah Williams', '2024-12-29 09:30:00', 369.99, 3),

('Michael Chen', '2024-12-30 16:00:00', 119.99, 65),

('Jennifer Adams', '2024-12-25 13:50:00', 14.99, 57),

('Tyler Brown', '2024-12-31 10:45:00', 99.99, 68),

('Lucas Chen', '2024-12-26 12:10:00', 199.99, 40),

('Ashley Davis', '2024-12-29 14:25:00', 179.99, 104);

120 %

No issues found

Ln: 248, Ch: 5 SPC CRLF UTF-8

Results Messages

	OrderID	CustomerName	OrderDate	TotalAmount	LegoID
1	1	Michael Chen	2024-12-15 14:23:00.000	849.99	1
2	2	Sarah Williams	2024-11-20 10:45:00.000	499.99	12
3	3	David Rodriguez	2024-10-05 16:30:00.000	469.99	2
4	4	Emily Thompson	2024-12-01 11:15:00.000	499.99	34
5	5	James Anderson	2024-09-18 13:42:00.000	399.99	13
6	6	Jessica Martinez	2024-11-28 09:30:00.000	169.99	30
7	7	Michael Chen	2024-10-22 15:20:00.000	159.99	9
8	8	Brandon Lee	2024-12-10 12:00:00.000	179.99	79
9	9	Ashley Davis	2024-11-15 14:55:00.000	199.99	20
10	10	Christopher Wilson	2024-10-30 10:10:00.000	149.99	17
11	11	Emma Johnson	2024-12-18 16:45:00.000	19.99	52
12	12	Tyler Brown	2024-11-25 11:30:00.000	14.99	53
13	13	Madison Garcia	2024-12-05 13:20:00.000	9.99	88
14	14	Ryan Miller	2024-10-12 15:40:00.000	19.99	66
15	15	Olivia Taylor	2024-11-08 10:25:00.000	24.00	67

Query executed successfully.

(local) (17.0 RTM) MaksToyStore 00:00:00 Row: 3, Col: 3 66 rows

GitHub Copilot Chat

New Thread

Copilot Chat

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Provide the T-SQL to create a table in the dbo schema to hold employee infor...

Which queries used the most CPU time in the last hour?

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+ Active Document X

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Claude Sonnet 4.5

Keys to success

Clear, specific intent

Use natural language in prompts

avoid slang, jargon, informal phrasing

Context

Use examples

Define the output format

Do not treat the chat window like the results grid

SQL Copilots Feedback

Copilot for SQL database in Fabric: within the browser

Copilot in Azure SQL database: within the browser

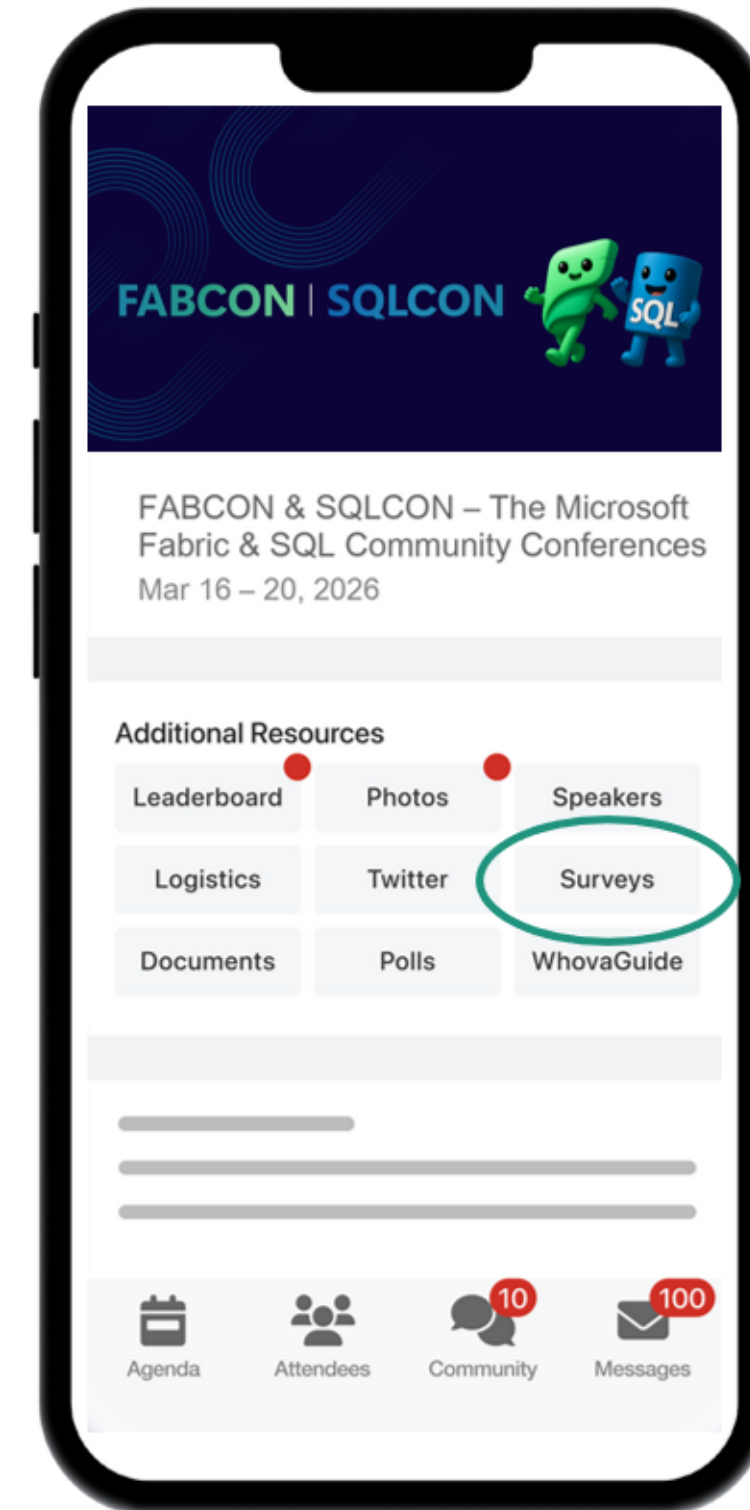
GitHub Copilot for mssql: aka.ms/vscode-mssql-copilot-feedback

GitHub Copilot in SSMS: aka.ms/ssms-feedback

How was the session?



Complete Session Surveys in
Whova for your chance to WIN
PRIZES!



Thank you!

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Yo-Lei Chen

yoleichen@microsoft.com

Erin Stellato

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Sound off.
The mic is all yours.
Influence the product roadmap.

Join the Fabric User Panel



Share your feedback directly with our
Fabric product group and researchers.

<https://aka.ms/JoinFabricUserPanel>

Join the SQL User Panel



Influence our SQL roadmap and ensure
it meets your real-life needs

<https://aka.ms/JoinSQLUserPanel>

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